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THE BUILDING NEWS

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ALLEGED "OVERLOADING" OF QUANTITIES.

THE claims made by the Toxteth Board of Guardians against the architects for their new infirmary, Messrs. C. O. Ellison and Son, of Liverpool, to recover damages for alleged professional negligence, have been so fully reported in our last and current issues that it will be quite needless to refer to facts; but the evidence adduced is of sufficient importance to warrant a few remarks. The guardians claimed £1,563 for negligence, and for moneys alleged to have been received by the defendants from the builders and contractors, Messrs. Kelly Bros., of Liverpool. We do not propose to discuss here the arguments used or the decision of Mr. Pollock, Q.C., the official referee, whose arduous labours have ended after five days with a verdict for the plaintiffs for the sum of £1,000. Certain points in the case stand out prominently. And first with regard to the quantities. Colonel Ellison was engaged to take out his own quantities, and, it is stated, made himself responsible for them, though on what ground he did so is not apparent. One of the principal allegations was that he failed to take due and reasonable care in taking them out; that they were "overloaded" to the extent of £1,065, the result being that the guardians had to pay that amount too much. Tenders were invited on these quantities, and the contractors' tender for £34,909 was accepted; a large part of which sum (£4,804) was for glazed brickwork for lining kitchens, sculleries, lavatories, and corridors, which the defendants allowed the builders to leave out to a great extent, and to substitute by salt-glazed bricks and plastering. There was a considerable saving in cost between the glazed bricks taken and those used, about £7 per thousand; but it is alleged no deduction was made in the certificates, and the guardians had to pay the full amount.

The evidence does not throw much light upon the question of quantities: they seem to have been taken out in conformity with local custom by the architects, but did not form part of the contract. They were, to all intents and purposes, taken full to cover errors, or as a "margin for contingencies," though an expert quantity surveyor would not understand the meaning of this phrase or that of "taken out net," unless in relation to timber-work. A great deal turned on the overloading of the quantities. A second block of pavilions for the infirmary were afterwards contracted for, and it was asserted that a quantity of brickwork mentioned in the bill was not carried out, though paid for. Arches and corridors were omitted by the guardians, but the quantities were not altered. The contract for these pavilions was £9,428. The excess on the quantities was estimated at something considerable, and the plaintiffs suggested that the building was worth £1,587 less than it would have been if it had been carried out in accordance with the quantities—statements that only can be verified by actual measurement and valuation. The guardians did not assert that the building was defective; the new blocks were finished to agree with the blocks first built. Still, the charge of overloading the quantities was a serious one. No architect is justified in putting in items which are not used, or quantities of material that are in excess—such as chimney-pots that were not wanted, or enamel bricks that were not used. What is more serious is the suggestion made in this case, that the architects were making something out of this excess by increasing their own commission, or by giving the contractor a chance of making a larger profit, or by sharing in the profit. There is not a tittle of evidence to support these suggestions, nor did the guardians make any charge of this kind, though the counsel for the defence tried to import this into his argument in the hope of refuting the whole claim for damages as being based on collusion or bribery. In fact, there was not the slightest ground for the belief that there had been any conspiracy.

We have never favoured the taking-out of quantities by the architect, especially in the case of public buildings of this character. The practice rather tends to open the door to all kinds of suspicion, and if anything goes wrong, the architect is held responsible. The practice of "over-loading" or allowing a margin for contingencies, under the idea that it protects the employers, is open to grave misunderstanding, and, as the referee pointed out, he could not see how the practice could in any way prevent any claim being made by the builders for extras. In this instance it was alleged that the tender of the contractors for work on the extended blocks was £1,065 more than it would otherwise have been. This may be so or not; the excess in the quantities made it appear probable that it was so. The contract was said to be in excess by the above stated amount. Upon this ground the charge of negligence was based. Was it negligent, the referee asked, to overload the contract to that extent? If the guardians had had to pay this amount too much, he could not doubt that it was negligent to take out quantities in that way. We have no doubt ourselves that the defendants acted *bonâ-fide* in what they did, and there was no direct evidence to prove otherwise. The result is instructive at least to the profession. The evidence as to custom, submitted by expert quantity surveyors, corroborates the view that such terms as "taken out net" or "a margin to cover contingencies" are doubtful and often misleading phrases. A sum to provide for contingencies inserted in the specification, and quantities that could be deducted if not used, is often put down, to the extent usually of 5 per cent., and is a useful precaution; and, from what we gather, this was the intention of the defendants. It was shown, indeed, that the work was completed at £500 less than the architects' estimate; another fact was that the cost of labour had increased since the first part of the blocks was completed. Again, there were additions which came to about the same value as the work alleged not to have been done. The principal thing that had to be proved was: Whether the plaintiffs have got the full value for their money? There is certainly no evidence to prove that they have not.

The second point of importance in this case is the appointment of clerk of works by the board of guardians. From the evidence it would appear that Mr. Henry Hallard acted as a sort of detective to watch over the work of the architect and builders; that, in short, the architects had little to do with his appointment; that he acted independently. He pointed out discrepancies between the quantities and the work done, and calculated that there was an excess of over £1,156 between the former and the latter. In fact, the gentleman appears to have discovered a great many faults; he pointed out to the architects certain discrepancies and excesses in the quantities, and, according to his calculation, the quantities had been so taken out that the contract price was increased by over a thousand pounds. Whatever the facts are, the position of the clerk of works gave rise to the idea mentioned by the referee—that that official was appointed to watch the architects' movements. The practice is somewhat unusual, and if generally adopted would lead to many complications and disagreements in the carrying out of buildings.

LOCAL BY-LAWS AND THE STRUCTURE OF WALLS.

WE lately drew attention to some of the suggested divisions and proposed alterations made by the committee of the R.I.B.A. with respect to the Building By-laws in non-Metropolitan districts. To the provincial practitioner and building owner the present administration of building regulations is extremely vexatious and oppressive in its action, owing mainly to the want of a uniform code in all essential matters. Building by-laws vary in several important details. While the larger towns have private Acts of Parliament of their own, other municipalities have adopted by-laws under the Public Health Act which vary in many particulars, so that two localities in close proximity that ought to be governed by the same laws have different regulations and interpretations.

With regard to external and party-walls, the by-laws prescribed are unnecessarily severe in many instances. Under one of the model by-laws relating to external walls, it is provided that the external wall of a new building or that part of it which is within a distance of 15ft. from any other building to be carried up so as to form a parapet 1ft. above the highest part of any roof or gutter which adjoins. According to this rule a row of semi-detached residences at intervals of less than 15ft. would have to be built with adjacent external side walls forming parapet walls, that, in short, no projecting eaves would be allowed. Now this rule is severe, and ought to be applied only to buildings of large dimensions of several stories. The effect of the rule is to give to a semi-detached block of houses or villas a bare and meagre appearance, and to hide the return sides of roofs. Indeed, the by-law has been considered so restrictive that it has been modified so as to apply only to large buildings. The modified clause is to the effect that a new building, whether of the warehouse class, a public building, or a new domestic building, that may exceed 30ft. in height, is to have such part of the external wall as is within 15ft. from any other building carried up as a parapet wall. Ordinary villas would therefore be exempt. Now in semi-urban districts it would be unnecessary to require the original by-law carried out. Even in the case of parapets to party-walls it is severe and exacting to require every dwelling-house, however small, to have a parapet of 15in. or 12in. above a roof or flat, and in some districts the clause has been modified, and is made only applicable to dwelling-houses of more than 30ft. in height, thus allowing small houses of two or three stories to be built without parapets.

When we imagine a semi-rural district adopting the stricter by-law, the reality of the grievance is obvious. The suggestion has now been made that when the external wall of a new building is within 7ft. 6in. of any boundary of the curtilage other than a public road, the wall shall be built of incombustible material, and no timber shall be fixed beyond the face of such wall. According to this rule, no half-timber or other combustible material can be allowed in the external wall of a house within this distance from the curtilage or boundary, a public road excepted. The rule is to prevent the risk of fire extending to any building at the side or in the rear that may be built near. If we understand this clause aright, a semi-detached block facing a road may have the front gables or upper story built with timber studding, but this must not be returned at the sides of the block if within the 7ft. 6in. prescribed. The effect also of this rule will be to give an air of unreality or lack of substantiality to half-timbered work by putting all the studwork on the front facing the road. For the sake of honest architecture we could wish that the clause did not exempt the front wall facing the public road.

Clauses relating to the structure of walls have been a source of much irritation to architects who have attempted to give any picturesqueness of character to their buildings, especially domestic residences, and in some semi-rural districts the effect of the by-laws has been to impose a rigid observance of solid brick or stone walls in the streets and buildings, depriving them of any variety in the architectural treatment. The clause No. 11 which provided that the inclosing walls of all new buildings are to be formed of good bricks or stone, or of "hard and incombustible materials" has been a hardship. In a few districts a modified clause has been used, permitting half-timber walls in dwelling-houses when they are distant 15ft. or more from adjoining buildings, under certain regulations; but these restrict the construction to blocks of houses not exceeding three in number, and are not at a less distance than 15ft. from any adjoining building. The regulation may be a desirable one in towns and closely-built districts, but is certainly needlessly restrictive for rural localities, where a more liberal use of materials and more freedom in handling ought to be permissible. For example, oversailing stories and gables are often seen with timber studding, or hung with weather tiles, that are very pleasing variations. These under many of the existing by-laws would not be allowed; it is now suggested that an addition should be made to the present by-laws to the effect that any story in a roof, and the story below, may be inclosed with timber studding not less than 4in. thick, properly framed, covered externally with weather tiling or plastering, and internally with plaster work, covering the whole surface excepting the openings; and that such an inclosure, when properly corbelled out, may overhang the wall below. Of course, such a treatment would be only applicable to roof or upper stories—not the ground story of detached or semi-detached domestic buildings. Many of our seaside towns can show buildings in which the upper overhanging stories are so treated; but under some local authorities timber studding covered with tiles would be prohibited for very insufficient reasons. These are matters which call for immediate attention on the part of urban and semi-rural authorities if the districts over which they preside desire to develop an architecture worthy of the localities. The by-laws in some places exclude the construction of hollow walls or render the by-law on that behalf so difficult as to be practically inoperative. Only by an intelligible principle of "give and take," or a liberal interpretation of the by-laws, which shall exempt buildings in semi-urban and rural districts from the operation and regulations that cannot be conscientiously applied to them, can we hope to obtain a loyal compliance with the spirit of the law. A blind uniformity would be quite as mischievous as an eccentric diversity.

* * *

ESTIMATES.—XIII.

CARPENTER.

For a thorough knowledge of the valuation of Carpenter's work, much study and experience are required, and we may refer the student to treatises on timber and construction, such as the "Notes on Building Construction," Laslett; and other works on timber, Hurst's Handbook, Laxton's price-book and trade-marks for a general knowledge, and to Mr. Leaning's excellent "Notes on Building Prices," which appeared in this Journal. The marks and brands on timber and deal and the shipping marks ought to receive attention, also the sales by timber brokers. It is impossible for every student to acquire this miscellaneous information, nor do we profess to enter into these details. We may observe that only large builders go to the public sales for their timber, and they can, of course, afford to price at a lower rate than the ordinary builder who buys from the merchant.

The chief things for the ordinary estimator to know are the chief timber ports, the shipping ports of the kingdom where hewn and sawn timber can be had, cost of conveyance, railway rates, the contractions used by merchants as to goods free on rail ("F. O. R."), "good marketable brands" ("G. M. B."), "good ordinary brands" ("G. O. B."), and other marks.

He also requires to know the limits of size that can be obtained in logs, their length and sectional area, the charge for sawing. In most cases the builder has to contract with a sawmill to saw and deliver at the site. The balk timber is floated into the Thames, and conveyed by canal or by barges, and the dock charges have to be paid by the importer.

Timber merchants generally supply the ordinary builder, and contract to provide the scantlings required. The price per foot cube at which this may be done is sometimes much below the price which a builder could undertake.

Some few years ago the following prices at the Dock sales obtained:—

	£	s.	d.
Best Dantzic, per load	3	15	0
Best middling, per load	3	10	0
Good middling, per load	3	0	0
American red pine, per load	2	12	0

These prices appear to be maintained.

It is necessary that the student of estimating should exercise himself in such questions as how to obtain the cost of timber sold by standard measure. He should, for instance, be able to find out the value of deals at the price per standard.

Let us take an example:—

1 std. 16 deals at £10 10s. per standard.

The deals will always be found out to work at 2 pence to each standard pound. Thus in £10½, the price of a standard, there is just 21 pence, which, when multiplied by the number of deals over, 16, will give their value; as, for example:—

£10 10 0 per standard
2
21 pence
16 deals
12)336 pence
28s. cost of 16 deals

	£	s.	d.
Cost of one standard	10	10	0
Cost of sixteen deals	1	8	0
Total cost	11	18	0

Again, to find the number of lineal feet in a standard of any scantling, multiply the thickness by width and divide 23,760 by the product, thus:—

Suppose we wish to find the number of lineal feet in a standard of 2½in. by 8in., then—

2½in. × 8in. = 20, and 23,760 ÷ 20 = 1,188ft. lineal.

If we require to obtain the value of any number of feet in a standard at £12 per standard, say 124ft. of 3½in. by 2in.—

3½in. × 2in. = 7sq.in., 124ft. × 7 = 8·68 $= 8\frac{68}{100}$ shillings = 8s. 8¼d.

In this case the product will give shillings in the hundredths place and fractions of shillings in the tens and units place. By adding the difference between the £12 standard and any other price, the value of any number of feet at any price per standard may be obtained. Of course, most price-books give tables of the value of running feet. A table of the equivalent prices per cubic foot and St. Petersburg standard is especially necessary in pricing.

A few memoranda are given as useful in estimating:—

One hundred (120) 12ft. 3in. deals, 9in. wide, each containing 2ft. 3in. cube is equal to 5⅖ loads of timber.

Ditto, 12ft. 2½in. deals, 9in. wide, each deal containing 1ft. 10in. cube, is equal to 4½ loads.

Ditto, 12ft. 1½in. deals, equal one reduced hundred.

One load of 1½in. plank or deals is 400ft. super.

Ditto, of 2in. plank or deals is 300ft. super. And so on in proportion.

The following rule to reduce deals to the standard of what is called a "reduced deal," is given.

A reduced deal contains 1ft. 4in. 6pts.

cube for 12ft. × 11in. × 1½in. = in decimals 12ft. × ·91666ft. × ·125ft. = 1·375c.ft. nearly. Hence the divisor 1·375 will serve as a constant for reducing deals of different lengths and thicknesses.

The following current prices may be useful:—

	£	s.	d.		£	s.	d.
White Sea: fast yellow deals per Petersburg standard	17	5	0	to	18	5	0
Second ditto	13	10	0	,,	15	0	0
Third ditto	11	0	0	,,	11	10	0
Battens are 40s., 30s., and 15s. less respectively.							
Petersburg first yellow deals	12	0	0	,,	14	10	0
Second ditto	11	0	0	,,	12	10	0
Battens 30s. and 20s. less respectively.							
Petersburg white deals	10	0	0	,,	12	0	0
Swedish mixed yellow deals	13	10	0	,,	17	0	0
Third ditto	12	10	0	,,	14	10	0
Fourth ditto	11	0	0	,,	12	0	0
Fifth ditto	10	0	0	,,	11	0	0
Dantzic and Memel fir timber, per load:—							
Best middling	2	10	0	,,	3	10	0
Good middling	2	0	0	,,	3	5	0
Common middling	1	10	0	,,	2	10	0

521ft. cube. Fir framed in floors.

This item may be priced as cut from planks and deals, as follows:—

	£	s.	d.
Cost of deals, per standard	8	10	0
Landing rate	0	3	9
Unloading, &c.	0	2	0
Waste, 10 per cent.	0	17	0
	9	12	9
Add sawing, say	1	10	0
	11	2	9

Equal to about 1s. 4d. per foot cube.

Add to this labour at ·75 hour of a carpenter, say 8d.; total 2s. per foot cube. This is a low price, and we prefer the price given for last item on p. 866 (last issue) —namely, 2s. 8d. per foot. (See note.)

432ft. cube. Fir framed in roofs.

The framing is largely done on the roof, and the cost of hoisting is therefore more.

	£	s.	d.
Say, per foot cube, as before	0	2	0
Hoisting, say	0	0	6
Waste, 10 per cent., say	0	0	2
Extra labour	0	0	2
	0	2	10

38ft. cube. Fir framed in girders, sawn down and reversed and bolted.

This item would mean a beam or beams of considerable scantling to be cut out of balk timber 12in. or 14in. deep. It would be more intelligible to give the dimensions and length of beams.

	£	s.	d.
Timber, per load, say 75s.	0	1	6
Cartage from docks at, say, 10s. per load, per foot cube	0	0	3
Sawing	0	0	4
Waste, 10 per cent.	0	0	2
Hoisting, putting together, &c.	0	0	6
	0	2	9

Another calculation:—

	£	s.	d.
Cost of load at docks	4	0	0
Cartage from docks at 10s. per load	0	10	0
25 per cent. waste, slabbing	1	0	0
Sawing 11s., hoisting 3s., putting together, say	0	18	0
	50)6	8	0
Per foot cube	0	2	6

This item is sometimes priced at about 3s. 2d. per foot cube.

If the beam is about 11in. deep, it can be cut out of planks, and could be done at about 6d. per foot less.

In estimating rough boarding for roofs, sound boarding, gutter boarding, the current prices of imported ready-sawn boards in thicknesses must be referred to. These are usually ¾in., 1in., and 1¼in. in thickness. If sawn out of deals or battens, it is necessary to make detailed calculations of the cost of sawing. If the prime cost per St. Petersburgh standard is, say, £8 at the docks, and if we take a scantling of 9in. by 3in. at 12ft. length, we shall get 666ft. super. of 3in. thick.

The items per standard will be:—

	£	s.	d.
Cost of deals	8	0	0
Landing rate	0	3	9
Unloading, &c.	0	2	0
Waste, 10 per cent.	0	16	0
	9	1	9
Then, if we say per standard	9	0	0
If the scantling 9in. by 3in. is sawn into ½in. thicknesses there will be five cuts, making six thicknesses = 370 cuts = about 31 doz. at 2s. 3d. for sawing	3	9	4
	12	9	4

Thus the cost of sawing depends on the number of cuts or thicknesses; a ¾in. thickness = three cuts in a 9in. by 3in. scantling producing four boards, a 1in. thickness = two cuts, or three boards, and so on.

The charges made at the mill for sawing are to be found in most price-books.

	£	s.	d.
For fir timber under 12in. square, three cuts to the load	0	6	6
Sawing, per 100ft. super.	0	4	0
Cross cuts, each	0	0	4
Cartage per load per mile	0	1	0

Prices for sawing are made per dozen cuts. If the length is 12ft., we have the following:

	£	s.	d.
Battens	0	2	3
Deals	0	3	0
Planks	0	3	6

And so on according to the length.

3 squares, 62ft., of rough boarding, ¾in. thick on roofs.

This thickness of boarding is imported ready sawn at about 9s. per square. It would take about 12 of 12ft. boards, 9in. wide each rough, per square. Add for carriage, say, 1s., 10 per cent. waste 1s., and for labour and nails, say, 3s. 6d., per square —altogether, 14s. 6d. per square. Laxton prices 1in. rough boarding at 19s. per square. If we consider £1 per Petersburg standard at 1s. per square of deals, 12ft. by 1½in. by 11in., the price per £11 standard would be 11s. per square added to sawing, labour, and waste.

2½ squares, ¾in., of 7in., yellow boards grooved, tongued, and beaded.

The price of these prepared boards is given at about 6s. 3d. to 9s. per square; add for carriage 1s., waste 1s., labour and nails 3s., = at latter price 14s. per square. We think for this item £1 per square is not too much.

35 squares 10ft. super. 1in. rough boarding, edges shot for roofs.

	£	s.	d.
Put the prepared boards down at per square	0	8	0
Labour shooting edges	0	1	0
Add for cartage, say	0	1	6
Waste, 10 per cent., say	0	1	0
Labour and nails	0	3	6
	0	15	0

* * *

THE PROPOSED STRAND-TO-HOLBORN THOROUGHFARE.

THE Bill to empower the London County Council to make a new street from Holborn to the Strand, and also to widen Southampton-row, came before a Select Committee of the House of Lords on Friday, Monday, and Tuesday, Lord Hawkesbury presiding. Sir A. R. Binnie, engineer to the County Council, provided and explained the plans. Mr. A. D. Young, the valuer of the Council, said his gross estimate for the cost of the property and land was £4,442,500. They expected to be recouped to the extent of £4,088,300, so that the net cost would be £354,200. In this calculation he has made no allowance for betterment, the extent of which he had not estimated. He added that they had arranged to transfer the works of the Metropolitan Supply Company, and they proposed to transfer the *Morning Post* building without interfering with the business. As regarded Short's (Limited) they considered that every circumstance in that case could be dealt with by the general law, and though they should be glad to reinstate Short's as near its present position as possible, they could not part with any portion of the "island" area.

Mr. Shaw Lefevre, the chairman of the Improvement Committee of the London County Council, said the present scheme was the first in which they had dealt with the principle of recoupment on a large scale. It was only in this way that a public improvement could be made to pay.

This concluded the evidence for the promoters, and Mr. Rickards called evidence for the opposition.

Mr. F. G. Chinnock, surveyor, the owner of the premises 12, Wellington-street, Strand, said he purchased the property in 1874. It was then leased to the *Morning Post*, and in 1891 he had given another lease for 28 years at the rent of £750 per annum. The proposed new road would not touch the main building, and would only cut off 100ft. from the back part, and he objected to his property being taken, in these circumstances, to be handed over to Lord Glenesk as compensation. He did not object to the improvement generally.

Mr. E. H. Tewson and Mr. F. T. Galsworthy corroborated the evidence, and the committee adjourned.

Mr. Balfour Browne, Q.C., for Mr. F. G. Chinnock, the owner of the premises, 12, Wellington-street, leased to the proprietor of the *Morning Post*, contended that it would be an injustice to his client to take from him property which was not required for the purpose of making a new street, and simply for the purpose of handing it over to Lord Glenesk.

Mr. Rickards, Q.C., asked that the committee before they gave a decision on the clause should know that the property to be taken from Lord Glenesk was 2,060 super. feet, and the portion proposed to be given to him was 2,660ft., so that the Council were giving him 600ft. The Chairman said the committee had decided that Clause 41 should stand.

The case of Shorts, Limited, was next considered. Mr. Balfour Browne said the business was an exceedingly valuable one and showed a profit of £20,000 a year. The Council did not require all the premises for the widening of the Strand. They only required about one half, and there was a considerable area at the rear of their property unoccupied. On that land he proposed they should be reinstated; but if that were not possible, he asked that he should have clauses providing that the Council, as the freeholders, should not oppose the transfer of his license, and should compensate him if he lost it.

Mr. Freeman, Q.C. (for the County Council), said they did not see why that case could not be dealt with under the ordinary law. They would, however, be very glad if they could save the large compensation by providing another site, but he could not pledge the Council to do so.

The Chairman said the committee could not grant a clause which would override the prerogative of the Licensing Committee.

Mr. Gerald FitzGerald said they only desired a clause to the effect that the Council as the freeholders should not oppose the transfer of the license, and that if the license was lost compensation should be given them.

The Chairman said the committee agreed that such clauses should be granted.

Mr. Freeman said, with the exception of Mr. Phelps, all the other opponents had been settled with.

Mr. Phelps, the lessee of property in Southampton Row, High Holborn, and Southampton-street, appeared in person to object to the inclusion of his property in the area of the betterment charge.

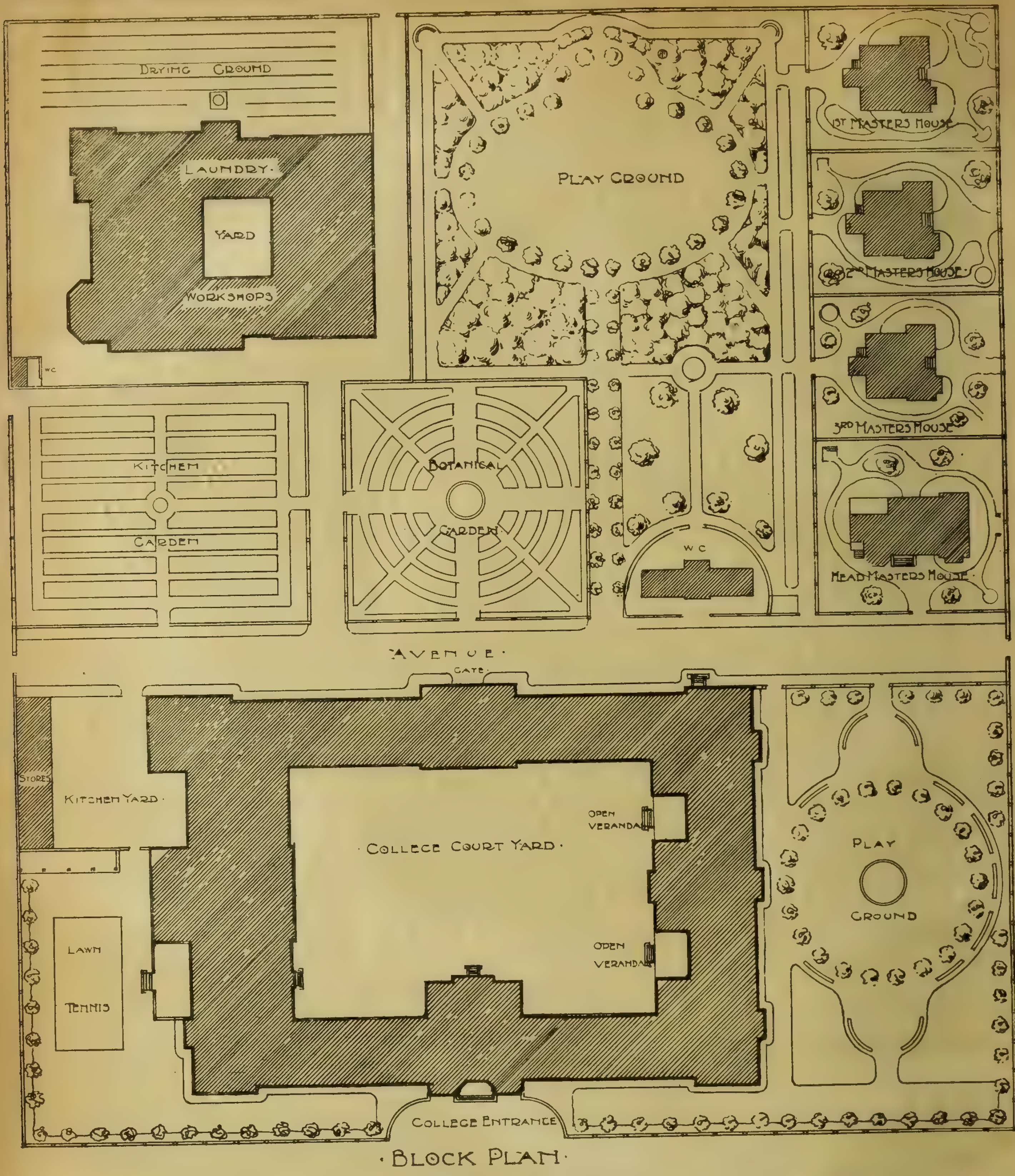
Mr. Phelps gave evidence; and Mr. E. H. Tewson, surveyor, expressed his opinion that the new street would not in any way improve Mr. Phelps's property. The "betterment" charge would injuriously affect the market value of the premises certainly for the ten years.

The committee decided that Mr. Phelps had made out his case, and excluded his property from the area of the betterment charge. The committee then went through the clauses of the Bill, and ordered it to be reported as amended to the House.

* * *

The new vicarage of St. John the Baptist, Penzance, was opened on Saturday in last week. It has been built from plans by Mr. Oliver Caldwell, of Penzance, at a cost of £1,400. Messrs. T. and J. H. Nicholas were the contractors.

The peal in the tower of St. Margaret's Church, Ipswich, has been rehung, and the number of bells increased from six to eight, the additional ones having been cast by Messrs. Mears and Stainbank, of Whitechapel. The increased peal was dedicated by the Bishop of Norwich on Friday.

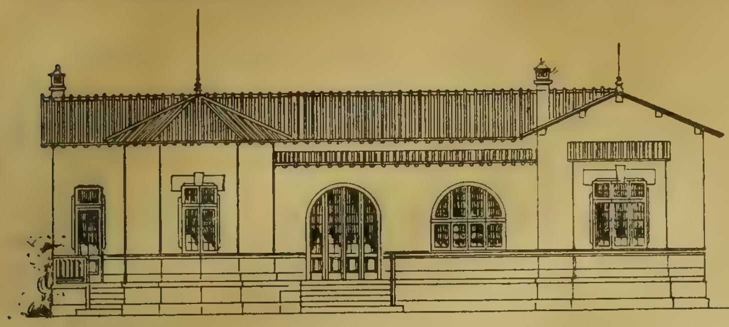


THE GORDON MEMORIAL COLLEGE, KHARTOUM.—M. FABRICIUS BEY, *Architect.*

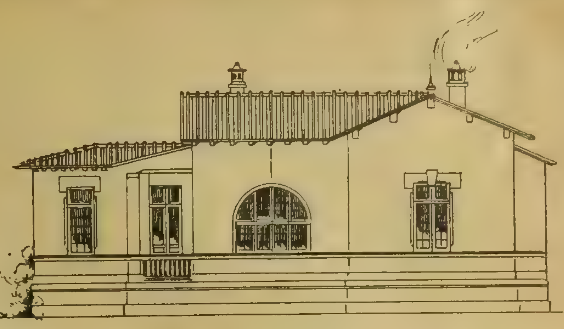
THE GORDON MEMORIAL COLLEGE, KHARTOUM.

[WITH ILLUSTRATIONS.]

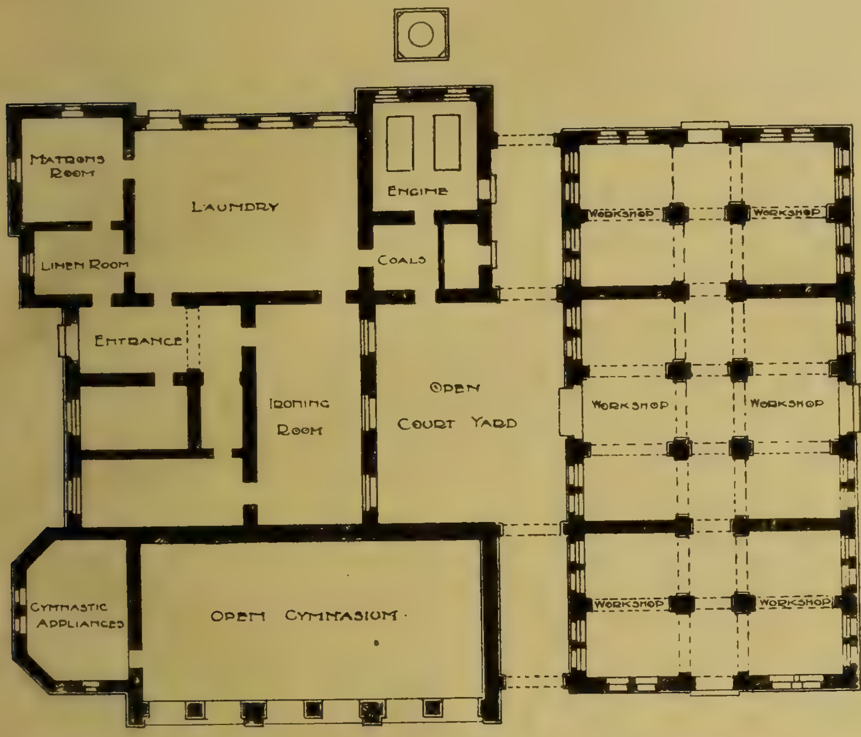
THE accompanying plans of this famous college, now in course of erection in memory of General Gordon, were prepared under the direction of Lord Kitchener, by M. Fabricus Bey, architect to the Khedive, at Cairo, and we are indebted to the architect for the loan of the drawings herewith reproduced. The block plan shows the arrangement of the entire scheme, with playgrounds, masters' houses, laundry, gymnasium, and workshops, in addition to the college buildings proper. The designations of the various departments are given on the plans, rendering them self-explanatory. The elevations will appear at an early date, and we have just received them from Cairo; but owing to the difficulty of carrying out elaborated detail at Khartoum, the original designs have had to be considerably modified, so far as the façades are concerned, and the enormous expense involved in architectural adornment has necessitated more utilitarian forms of building than the architect had intended. A staff has been organised by Lord Kitchener under an officer qualified to bring the undertaking to a satisfactory completion. The elevations will be faced with bricks made in the immediate country, and alternate courses of red and black brick will be employed. The dressings will be in white stone in the copings, pilasters, and arches. The accommodation provides for three hundred male students; but it is probable that the building of the entire scheme will be postponed. The dining-hall is cruciform on plan, and the masters have a separate room overlooking the quad. Spacious corridors on both floors connect the various departments. There are dormitories on both floors, the arrangement of the beds being very different from the custom in English colleges and schools now, whatever may have prevailed in the past. The want of a thorough current for ventilation is conspicuous too in the plans, but it is possible that provision may be made irrespective of window openings, and so not shown by the plans. The laundry block has a gymnasium attached, and the workshops seem well adapted for their particular


East Elevation

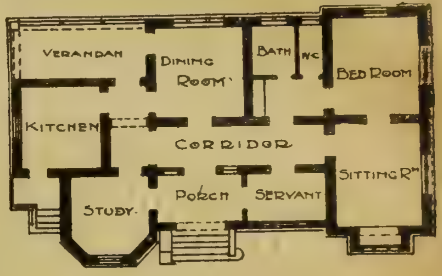
HEAD MASTER'S HOUSE.


East Elevation

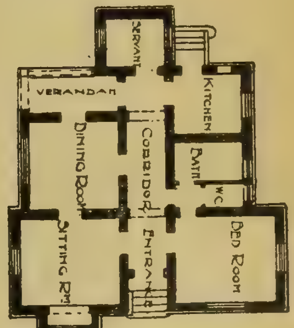
SECOND MASTER'S HOUSE.



·Laundry Gymnasium and Workshops·



HEAD MASTER'S HOUSE.



SECOND MASTER'S HOUSE.

THE GORDON MEMORIAL COLLEGE, KHARTOUM.

purpose. The masters' houses are shown by plans and elevations, the accommodation being contrived on one floor.

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EXCAVATIONS IN MELOS AND CRETE.

PROFESSOR JEBB, M.P., president of the Hellenic Society, took the chair on Thursday in last week at the annual meeting of the society, held at 22, Albemarle-street, W.

The hon. secretary, Mr. George A. Macmillan, read the report of the council for the session 1898-99, in which it was said that important excavations had been carried on in the island of Melos, and some work had also been done at Naucratis. Grants had been made of £100, as usual, to the British School at Athens, and of £50 a year for three years in aid of the new Platonic Lexicon to be published by the Clarendon Press, under the editorship of Professor Lewis Campbell. The ordinary receipts of the society had risen from £789 during 1897-98 to £820.

The chairman, in moving the adoption of the report, after observing that for the third season explorations had been made on the site of a prehistoric city near the village of Phylákopi, in the north-west of Melos, representing the earliest capital of the island of Melos, said the prehistoric deposit found there belonged to the interval between the earliest culture traceable on Greek soil and the later Mycenean age. The earliest pottery found at Phylákopi was primitive unpainted ware, hand-made and hand-polished, such as was found in the early cist-tombs of the Cyclades. Next in age to this came a series of vase fragments with painted geometric designs; and to this again succeeded in chronological order a series of fragments known as "Theræan"—i.e., belonging to the class found in the island of Thera (Santorin). The work of these three periods was all, of course, pre-Mycenean. A circumstance of peculiar interest in connection with the excavations at Melos was the discovery that the ancient town at Phylákopi must have been a prehistoric centre for the manufacture and export of implements made of obsidian. Melos seemed to be the only place in the Levant where obsidian, a volcanic product, occurred in a highly vitrified state; and it was probable that during a very long period Melos was a centre from which obsidian work was exported to the islands and coasts of the Ægean. Professor Jebb then turned to the proposed exploration of Crete. The High Commissioner of the Powers in Crete, Prince George of Greece, was favourably disposed towards the scheme, and, with his approval and support, certain sites in Crete of historical importance and representative character had already been reserved for British exploration. One of these was Cnosos, the city of Minos and Dædalus, the centre of the ancient sea-power and the earliest home of Cretan art. There was a mound at Cnosos, containing remains of a prehistoric building, which Schliemann desired to excavate, and which would be one of the first objects of investigation. Another site was Præsos, a seat of Cretan life at a very remote period, where an archaic inscription had been discovered in a dialect to which the key had yet to be found. A third was Lyttos, where fragments of ancient laws had been unearthed on the acropolis. Another site secured for their explorers was the cave of Psychro, on Mount Dikte, the legendary birthplace of Zeus. Broadly speaking, the great interest of prehistoric Crete consisted in its character as the first Ægean station, or stepping-stone, of the earliest civilisation which passed westward from Egypt. Crete bore witness, among other things, to the existence of a system of sign-writing older than the use of the Phœnician alphabet, and even to an intercourse with Egypt which might date from 3000 or possibly 4000 B.C. Nothing could be fitter than that Englishmen, after taking a leading part in ameliorating the present condition of Crete, should resume, in a scientific spirit, the task of investigating its earliest civilisation. After referring to Mr. Duncan Mackenzie's recent visit to the island of Cos, Professor Jebb mentioned the proposal to establish an English school of archæology at Rome. Hellenic studies would certainly gain thereby, as well as those which were more specially concerned with Roman or Italian literature and archæology. It would cost less than a school at Athens, for the obvious reason that it would not have to bear the charges of excavation.

The motion was seconded, and the report adopted.

Mr. D. G. Hogarth, director of the British School at Athens, gave a short account of the work of the school during the last year, and urged the desirability of the exploration of Thessaly, hitherto an almost untouched field.

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At the town-hall, Tiverton, on Wednesday week, a Local Government Board inquiry was held by Mr. H. Percy Boulnois, M.I.C.E., into an application by the Tiverton Town Council to borrow £6,750 for the purposes of sewerage and sewage disposal, and £500 for the purchase of Little Silver Cottage and orchard for the purpose of a store-yard.

THOMAS WALLIS, WOOD SCULPTOR.*

WE have seldom read a more thoroughly interesting book than this record of the life of nearly seventy years of work of a genuine "working man," whose reputation was honestly and ably won half a century since in the teeth of circumstances as unfavourable as ever were overcome by pluck, industry, and perseverance. Many readers are doubtless familiar with the author's work as a wood-carver—probably unsurpassed in his day and generation. Many more will read his story, we are sure, with hearty admiration, and the fullest indulgence for the natural, if occasionally tedious, garrulity of age which excusably attaches importance to matters of not very general interest.

Wallis was born on Feb. 4, 1821, at Hull. His father was a cabinetmaker, whose non-success in business was followed by poverty. There was a big family; but the mother was a brave woman, and insisted on the boys being kept to school, "if they had to go with rags on their backs and half-filled stomachs." The schooling of Thomas, however, was not a very protracted one, for at nine years of age we find him working in a whalebone factory, then in a mustard and blacking works, next as errand boy in a boot and shoe warehouse, and afterwards in the same capacity at a surgery. In 1834, in spite of the continued poverty of his parents, he was apprenticed to Mr. Thos. Ward, a carver and gilder. Twelve hours work a day in summer and eleven in winter did not daunt the youngster, who quickly took to his craft, and joined a Mechanics' Institute. One would have thought the lad's scanty leisure was fully occupied; but he "took a great interest in politics," though only an apprentice boy, and was enthusiastic in the cause of Chartism, of the rise and progress and decline of which he gives an intelligent summary; but he repented of "wasting so much time," and determined to stick to carving and learn perspective drawing. In 1841 he finished his apprenticeship—"with 6s. 10d. in his pocket to begin the world with." His master, however, at once gave him work at 24s. a week, and Thomas at once began to pay off his parents' liabilities at the rate of a pound a month, besides paying his mother 8s. a week for his board and lodging. Work becoming slack in Hull, Wallis found his way to Louth, and got employment there with a carver named John Brown. Brown died in 1844, and Wallis, having saved £26 13s. 2d., took over the business, having just £11 left after settling up with Brown's widow, and owing £23. Work came in, and on Oct. 16, 1845, Wallis felt justified in getting married. Sticking manfully to his business, "often being hard pressed for ready money, sometimes being left without a sixpence," Wallis was never daunted. On the last Saturday of 1846 he found his cash in hand was just 2s. 1d.! This, he remarks, "suggested a poor preparation for a happy new year." His chance was coming along, however; but he worked while he waited for it, acquiring the art of lithography, and helping architects who could only do plans and elevations, to make perspectives for their competition drawings.

In December, 1847, his first patron, Mr. George Tomline, gave him an order for a game panel, and subsequently another for a model of Louth Church. More commissions followed, and some good introductions. Wallis determined to send some of his works to the Society of Arts, and, to his delight, was awarded the Society's medal, and a special prize of £5 for "unusual excellence." Among other letters of encouragement at this time he reproduces one from Henry Laxton, who promises him a paragraph in a weekly periodical "in which he was interested," *The Architect*, and also another in the *Weekly Dispatch*. To make one modest success the footstool to another was evidently the motto of our indefatigable carver, and he ambitiously determined to exhibit at the Great Exhibition of 1851, which was then being organised. His work received a flattering amount of attention, and he was awarded one of the four large Prize Medals for wood-carving, M. Leinard, the French carver, M. C. Geerts, of Belgium, and Mr. W. G. Rogers getting the others. Equal success rewarded him at the Paris Exhibition of 1855.

Work now came in without much seeking, and with adequate remuneration. Botany, entomology, astronomy, and Volunteering were found time for, however, and a well-spent life seems to have gone on smoothly till in 1866 Mrs. Wallis suddenly died. Weeks of ill-health followed, and when the bereaved husband got to work again he found his eyes failing him. He soon determined to learn a new business—land-surveying and engineering. "It would do him no harm," he thought, his one resolve being "to stick to work whatever it might be." He still went on with his wood-carving; but his aptitude and ability as a surveyor soon became recognised, and after a good deal of work, some paid for and some not, he became borough surveyor of Louth in 1885, having during the previous twelve years acted as inspector under the Public Health Act. He resigned both offices in 1893, and has since lived in honourable retirement, still able at 78 to occupy his days without *ennui*.

Twenty years ago Mr. Wallis's fame as a wood-carver had, so to speak, outlived people's knowledge of his existence. Even our old correspondent Harry Hems, who has put it on record that it was Wallis's study of "Spring" in the Exhibition of 1851 which first filled him with a desire to be a carver, thought then that the "unrivalled wood-carver was dead and gone." As Mr. Wallis's mother lived, hale and hearty, in spite of her hard struggle with poverty, to the age of 95, all will feel justified in wishing him twenty years more health and usefulness. His grasp of the principles of his old art is evidently as vigorous as ever. It is worth noting that his own practice as a carver was diametrically opposed to what has been called the "three-men" method. All his exhibited works were the product of his own brains and fingers. Ordinary work, of course, was partially done by his assistants. His method, as he describes it, was, after building up a careful clay model, to make a definite central line on the wood to correspond with a similar line on the model, and to retain this until the work was nearly complete. Then after marking various points on the model to form a series of triangles, he wasted off the rough from the wood block, and left on the wood corresponding stations, or slight projections, so that the main body of the work was determined, and its correctness to the model insured on the same principle as the Ordnance surveyors work the triangulation of any district for mapping purposes. In carving with this method of triangulation, a movable pointing gauge is used to insure the true quantity to be left for the finish, and then the details are worked out with as much care and delicacy as the artist is capable of.

The autobiography is wonderfully well illustrated with 24 half-tone process blocks and four diagrams, nearly all from Mr. Wallis's own drawings or works. The two views of Louth Church and its interior are particularly well done, and testify to the good draughtsmanship which stood him so often in such stead.

CENTRAL SCHOOL OF ARTS AND CRAFTS.

AN exhibition of considerable interest will be opened to the public at the Central School of Arts and Crafts, 316, Regent-street, opposite the Polytechnic Institute, on Monday next, July 10, and remain open throughout the week from 12 noon to 8.30 p.m. daily. The work done by students includes bookbinding; silversmiths', goldsmiths', and jewellers' work; chasing and engraving; enamelling; stained glass; ornamental leadwork; stonework, by architects; woodcuts in colour, by a method based on Japanese practice; embroidery; wood-carving and gilding, &c, also modelling and designs for various processes. Admission will be free.

The school was established in November, 1896, by the Technical Education Board of the London County Council, to meet a definite want—viz., to provide for apprentices, journeymen, and others engaged in the more artistic trades such training, subsidiary to the workshop, as each student may require in relation to his special craft. Admission to the school is, within certain limits, restricted to those actually engaged in these trades, and no attempt is made to provide for the amateur student of drawing and painting. The school is exceedingly well equipped with all appliances for carrying on practically the crafts embraced, and with fine examples of old work to serve as a stimulus. The staff is composed of specialists of distinction in their particular subjects, working under the general direction of Mr. G. Frampton, A.R.A., and Mr. W. R. Lethaby.

During the third session, just completed, the school has been very successful, not only in attracting students (nearly 600 having been in attendance), but also in the quality of the work done, in which there is a distinct advance upon last year. At the general competition in March last for art scholarships and exhibitions offered by the Technical Education Board, open to all art schools and classes in the London area, no less than 47 awards out of a total of 150 were made to students of the Central School, to the work of which special commendation was given in the report of the examiners, Sir W. B. Richmond, R.A., and Mr. Selwyn Image. The students appreciate and profit by the facilities given them for gaining an all-round view of their crafts, such as is no longer possible in the rigidly subdivided workshop.

Within the limits of the present temporary premises no great development is to be looked for; but a small class for ornamental writing (suitable for illuminated addresses) is contemplated for next session, which commences on September 18. Full information as to this or any other classes can be had on application to the Curator at the school.

EASTWOOD AND CO.'S BARGE MATCH.

IF we live to see developments of the same sort that have transformed the business of Messrs. Eastwood and Co., Limited, from the modest undertaking it was when we first knew it, into the leading firm of its class, it is more than probable that its annual Barge Match will become a river fixture of world-wide interest, and witnessed by millions. When the business was taken over by the present Company, of which Mr. George Wragge is the ever-resourceful and always fortunate managing director, the firm had two wharves—it now has 18. It had no brickfields, it has now over nine, at which in 1898 more than one hundred millions of bricks were made. Most of these bricks are brought to London by barges, of which the company had two in 1872—it has now 44 of its own, besides employing more than 50 others. These barges are registered as ships, and carry from 80 to 120 tons. The crew consists of a captain and a mate. The men are thorough sailors, and as they have to go through all sorts of weather, and encounter all sorts of hindrances, all legitimate encouragement is to the advantage of the firm's numerous customers. To stimulate their captains, therefore, and to improve the design of profitable sea-going barges generally, as opposed to mere racing-machines, Messrs. Eastwood and Co. established this annual match. They are of opinion that the present rules of the Thames and Medway barge matches are most unfair to the genuine working barge, and we thoroughly agree with them. As no protest has effected a change in these rules, Messrs. Eastwood and Co. have arranged this match for their own men, and we have very little doubt ourselves that eventually it will utterly surpass in general public interest the mere professional racing fixtures of the Thames and Medway.

Last Tuesday's match was in every way a success. Some 250 employés, friends, customers, and guests of the Company started from Fresh Wharf, London Bridge, aboard the ss. *Laverock*, for the course. The barges were sailed from Gravesend Reach to an imaginary line drawn from the entrance to Stangate Creek to the signal-post of Port Victoria. The start was made at three minutes past noon. The three winners were:—

(1) The *Durham*, Capt. T. Hart; time: Nore, 1.51; finish, 2.45. (2) The *Iota*, Capt. J. Summerhayes; time: Nore, 1.54; finish, 2.49. (3) The *Northumberland*, Capt. F. Beadle; time: Nore, 1.56; finish, 2.51. The prizes were:—First barge: Captain, £5; mate, £3; third hand, £2. Second barge: Captain, £3; mate, £2; third hand, £1. Third barge: Captain, £2; mate, £1; third hand, 10s. And in addition each captain was presented with a special cap and badge. The race was as interesting throughout as the day was an enjoyable one, thanks to the hospitality of the Company, and the genial zeal with which all arrangements were carried out by Mr. H. J. Byrne, the efficient right-hand of the managing-director.

The Gas Light and Coke Company's Bill, which authorised the raising by the company of £2,500,000 additional capital, has been rejected by a Select Committee of the House of Lords.

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* Autobiography of Thomas Wilkinson Wallis, Sculptor in Wood. Louth: J. W. Goulding and Son, 20, Mercer-row.

LEGAL INTELLIGENCE.

Croxteth Guardians and their Infirmary.—Claim against Liverpool Architects.—The action brought by the board of guardians for Toxteth Park against Messrs. C. O. Ellison and Son, architects, of Liverpool, claiming £1,563 damages for alleged professional negligence, has been concluded at St. George's Hall, Liverpool, before Mr. Pollock, Q.C., the Official Referee. We reported the earlier days of the trial in our last issue, pp. 895-6, last volume. The ground of dispute was, it will be remembered, the building of the union workhouse infirmary in Smithdown-road. Mr. A. A. Hudson, of London, appeared for the plaintiffs, and Mr. Segar for the defendants. Mr. Segar handed to the official referee the document promised on the previous evening showing the defendants' set-off for extras against the plaintiffs' claim for deficiencies. Counsel, replying to Mr. Hudson's question, said the estimates were not made at the time of the settlement. There was no actual statement made at the time showing additions and deductions. The Official Referee remarked that what he desired to see produced was a list of any matters supposed to show a set-off at the time of statement in respect of matters which the builders were entitled to claim as against any deductions made. Mr. Segar did not suggest there had been any such document drawn out. The only one was Messrs. Kelly's claim itself, which was looked at by the architects. Defendants' case was that the guardians had not lost one single penny, that in point of fact the losses and gains were about equal. The account put in showed there was a difference of a few pounds against Messrs. Ellison, but, taken as a whole, the matter was not worth noticing. According to the account the figures were £9,168 16s. 9d. on one side, and £9,177 on the other. That was a difference of about £9 in favour of the guardians, and if that was all in a £9,000 contract he should say, if their calculations were correct, it was obvious this settlement was a *bonâ-fide*, judicious, and proper one. The Official Referee said that if the matters were taken into consideration at the time, and an adjustment was made based upon these figures, then that was a matter for consideration; but if the document was prepared now merely for the purpose of trying to make out that the defendants' case was a good one, then it was worth very little. Mr. Segar proceeded to say he should contend that if these were grave and substantial matters they were entitled to have each one considered, whether or not they were in the defendants' account, because the action was one in which the guardians said they had been defrauded. The Official Referee said that was not so. The guardians said that it was a matter in which defendants had been guilty of negligence. Mr. Segar replied that with regard to this account he thought it would be found that the bulk of it referred to matters which clearly were in Colonel Ellison's account at the time he certified for the completion of the work. If that was so, it was important that it should be considered from Colonel Ellison's point of view. Mr. Pollock: The defendant may say that there has been no negligence, and they may also show there has been no damage to the plaintiffs; in that case, that account may possibly be material for the purpose of showing there was no damage, but it is not the account I understood was to be produced. Continuing the evidence for the plaintiffs, Mr. Hudson called Mr. Stoner, quantity surveyor, of London, where he had practised for 33 years. Witness said the words "these quantities are taken out net" meant that the quantities were taken out net without any allowance for waste. Within his knowledge there was no such thing known to quantity surveyors as a margin. In his opinion, the quantities in that case were not taken out in a proper professional manner. If an office-boy in London did work like that, he would receive his week's wages. Of course, it might be the custom at Liverpool, but it was foreign to anything he had seen in his profession. Mr. John Blakey, architect and surveyor, Liverpool, said there was no such thing as margin in quantities. He had seen the books of quantities in that case, and did not think the quantities were carefully taken out. Mr. Pollock: Are they taken out in accordance with what is your experience in this neighbourhood? Witness: No. In cross examination, Mr. Blakey said the words "taken out net" in regard to quantities only referred to carpenters' and joiners' work in regard to the thickness of timber, and to masonry where the latter was taken in detail. Mr. Robert Isaac Bennett, architect and surveyor, Manchester, and president of the Society of Architects in that city, said it was important that the specifications should agree with the quantities. He could not say exactly what was meant by the phrase "these quantities are taken net," but it could only refer to timber work. Witness had measured the building, and found the difference between the work done and the quantities was £1,560. In cross-examination, witness said he would allow 4 per cent. as a fair margin for contingences. Mr. James Moulding, who has been clerk to the Toxteth Guardians for 32 years, said that in 1890 the guardians decided to build an infirmary in connection with the workhouse, and a resolution was passed employing the defendants. Messrs. Kelly Bros. submitted a tender for £29,380, plus £4,804 for enamelled brick dadoes, and with other small allowances the amount of the tender was brought up to £34,909. The contract was afterwards reduced to £25,799, included in which was an estimate for enamelled brickwork to the extent of £3,235. The work to be done afterwards consisted of blocks C, F, and G, and amounted to £7,504, plus £1,704 for enamel work. The latter was the work which they complained had not been thoroughly carried out. He was never able to get from the architects a press copy of the bill of quantities. In 1896, when the guardians decided to erect blocks C, F, and G, the defendants were employed as architects, and in order to avoid trouble about quantities, witness, on May 11, drew up a document, which was approved by the guardians, and to the conditions of which Messrs. Ellison subscribed. Tenders were invited, and Messrs. Kelly sent in the lowest tender. Some correspondence passed between witness and the architects, in the course of which the latter claimed to have complied with the stipulations contained in the document of May 14. Until the opening of that court inquiry he had not heard that a lot of extra work was set off against the excessive quantities. Mr. Segar, on behalf of the defendants, said the charges against his clients were not only novel but grave; but the opening statement of Mr. Hudson was weighted with an amount of suspicion which all who had heard the case would feel ought to have been eliminated. When the case was first presented, there were distinct suggestions that Messrs. Kelly and Messrs. Ellison, from motives of their own, had been putting their heads together and acting in concert for the purpose of carrying out a scheme which showed a gross conspiracy to defraud the board of guardians of various sums from time to time. Mr. Hallard, who was in charge of the work, did not suggest it, and there was not an atom of evidence offered to show that Messrs. Kelly and Messrs. Ellison had done anything of the kind. Messrs. Kelly knew from the first, and so did the building committee of the guardians, that the second block of buildings was to be erected exactly in the same way as the first block, and they knew the difference between enamel-faced walls and walls that were partly salt-glazed. They met constantly on the ground, and saw the job from start to finish; and knowing perfectly well what had been done in the case of the first lot of buildings, the guardians appointed the defendants as their architects. After he had been responsible for work involving £33,000, they now came and charged him with having grossly neglected the work of taking the quantities. Colonel Ellison was a gentleman who stood at the top of his profession, and had erected buildings in Liverpool and other places, including the Birkenhead Town Hall, which would be a testimony to his ability long after all in that Court had departed. Could anyone take seriously the attitude of the guardians, who came forward to accuse him of negligence, and say they had been put to the loss of £1,560 on a contract of £9,600? Colonel Ellison's work as an architect extended over 45 years, and there had never been a suggestion against his probity until Mr. Hallard came on the scene. Mr. Segar called attention to the fact that in support of their case the Toxteth guardians were obliged to go outside Liverpool to obtain professional evidence. Unless there was evidence that in the taking out of quantities there had been negligence, or want of professional skill, there was no case against the defendants. The plaintiffs had not called a single member of their building committee or the clerk of the works who had to deal with the earlier contract. Up to the present the defendants had never had a measurement of the work on their own behalf, but were left entirely to the figures of Mr. Hallard, unsupported by any Liverpool architect. It would be shown on behalf of the defendants that the later work was done on the same scale as the earlier building, and done very cheaply, and that the whole building as it stood was fully worth the money paid for it. It had not been suggested that anybody could do the work cheaper than Messrs. Kelly. Whatever might be the result of that case, the defendants had the consolation of knowing that they were held in the highest regard, and had done their work well as architects and in the interests of the public. Mr. Benjamin Kelly, of the firm of Messrs. Kelly Bros., Liverpool, was called. He said his firm constructed the earlier as well as the later portion of the Toxteth Union Infirmary. He always found the quantities well taken by the defendants, but of course they varied in many matters. They had always been perfectly ready to refer the matter to Mr. T. D. Barry, the arbitrator under the agreement. Col. C. O. Ellison, the principal partner in the defendant firm, called, said he had been in practice in Liverpool for 45 years. Among the buildings erected from his designs were the Adelphi Bank, Liverpool, the Birkenhead Town Hall, and many churches, chapels, and board schools in Liverpool, Bootle, and the neighbourhood, and he had never had any such complaints as the one made against him now. He was asked by Mr. Moulding, the clerk to the Toxteth Guardians, to compete for the new infirmary buildings to provide accommodation for 421 beds. His estimate was £28,000, exclusive of drainage, heating, and other items. There were many other competitors; but his design was accepted in December, 1890. He made out the quantities in the same way his firm had been in the habit of making them out for years. In some cases he left a margin for contingencies, the measurements being taken more fully than was absolutely necessary, because from long experience he found it in the interests of his clients. If quantities were taken out net, the builders, to cover their risk, generally put on a price varying from 5 to 10 per cent.; but if builders knew there was a margin in the quantities they put the price very much lower. Messrs. Kelly Brothers' tender, which was the next to the lowest, was accepted, and work commenced in 1891. The building committee of the guardians applied to him for the priced quantities; but he could not give them up, as they belonged to the builder. At their request, he allowed a deputation of four to inspect the priced quantities at his office. It was agreed that the priced quantities should be lodged under seal with the guardians. He was asked by Mr. Moulding to prepare a contract, and he did so in the form adopted by the Liverpool Society of Architects; but the clause providing for any error in the quantities should be rectified was struck out by the subcommittee, or surreptitious committee as it was called, although he objected. That was done with the contract for the first section of the work, and the same course was followed with the second. The committee saw what had been done in the first blocks of the buildings with reference to the enamel brickwork, and they made no objection; on the contrary, they were well pleased. Asked how he came to make the alteration from stretchers and headers to stretchers only, Colonel Ellison said he followed a suggestion made in one of the medical journals, which pointed out the importance of having as few joints as possible in the walls near the beds, where disease germs might lodge. The change obviated a great number of joints in the walls. The use of these bricks had rather improved the effect upon the eye. Mr. A. A. Hudson: We have not suggested there is any injury to the eye; it is only the pocket. Colonel Ellison, continuing, said the difference between the cost of a wall with the brown teapot mould dado and a wooden ebonised one would be possibly 3s. or 4s. per lineal yard; and the difference between the stone headings as they now stood and those described in the quantities was practically nothing. As to the lessening of the headings over the windows, he said it was desirable the window should be as close to the ceiling as possible. Before letting the contract the quantities were open to the inspection of eleven builders, most of whom had done work under him before. It was simply impossible to take out quantities mathematically accurate from the plans. His practice was to allow 5 or 6 per cent. as a margin. With reference to the substitution of a stone heading for the enamel bricks for the archwork over the kitchen fireplaces, he said that instead of the guardians losing they benefited to the extent of £2 6s. for each fireplace. He had looked over Messrs. Kelly's bill, and he thought that what had been omitted was well balanced by the things which had been done extra. For one thing, the excavations were increased owing to a large quantity of soil from the first buildings having been left lying there for use for gardens. He said he had gone through the statement of claim, and he found that, whereas the total came to £1,580, when checked by the prices in the builders' schedule the items totalled only to £1,065. Mr. Segar: Taking the whole work, do you think that the payment to Messrs. Kelly was fair and proper under all circumstances; and was it proper for you to certify that account?—In my judgment it was. If there is any question between the owners of the building and the contractors, is the architect's opinion, if it is honestly given, supposed to be conclusive?—Well, I have never known my opinion to be questioned before. Was your opinion given honestly?—Thoroughly. Are you still of opinion that the board got full value for their money?—I believe they got one of the cheapest buildings in the district, and at considerably less per head than the West Derby Union. The money paid for the work was £523 less than the estimate made out in the first instance?—It was rather more than that, I think. The Official Referee: That is immaterial, because confessing that the building has not been carried out in accordance with the original estimate, the question is what is the difference between one and the other. Mr. Segar said he could not admit that as quite an accurate statement, because the original estimate was not made upon the quantities as they appear, but upon what Kellys knew what was likely to be done. Kelly Bros., guessing what was the actual work which would have to be done, and what actually had been done, put a certain figure on the work, and that figure was not more than the actual work which had been supplied. Cross-examined by Mr. Hudson, Colonel Ellison stated that he had not measured these buildings since this action was commenced, and he complained that he was not allowed to take measurements without giving notice. The excess of quantities, according to the plaintiffs, was £1,218; that was not a safe margin, nor was £1,065. The Official Referee: That is, it is more than a safe margin?—Yes. Mr. Hudson: At the time you took out these quantities and allowed a margin, how could you tell there was to be any set-off?—You can't tell; that is why you put the margin. I may take it that whatever margin there was you put in intentionally?—Yes. What was the object of putting in a margin like that?—To allow for every contingency that might occur, and so as to bring it out in the end free from extras. In further cross-examination, Colonel Ellison said that when the guardians applied to him to adjust the quantities as against the extras, he told them that he could not take the quantities into account at all, as they were no part of the contract. Messrs. Kelly did not refuse to have matters adjusted. At that time Mr. Hallard was asking for an adjustment as to the salt-glazed bricks. Mr. Hudson: And you told him you would deal with him in the usual way. What was the usual way?—Any excesses against omissions; exactly what we have done. And you had certain extras in your mind when you sent in that statement of the 22nd February, 1898, to the guardians?—Yes. Why did you not supply the guardians then with a list of those extras?—Because the matter had not been looked into. You had given a certificate, and were asked to supply a debtor and creditor account; don't you think it would have been better to have said then that there were extras to set off against the omissions?—Yes, in the light of present experience. You say now that one balances the other; but why didn't you tell the guardians so then?—It is rather a difficult question. My impression is that I was the judge of those things, and in the discretion I held I did what I thought was the best for my clients. They asked you to supply an account, and you sent to them a form of account on Feb. 22, 1898, which the guardians would not accept. Why did you not then settle the matter by supplying an account of the extras you now mention?—I did settle it, by offering to leave it to the arbitrator, and I thought I was taking the proper course. But you were advising the guardians?—I am not quite sure that I was, for through the whole of this job the guardians never asked me to advise them nor to attend a single meeting of their committees. If they had been guided by me as their architect all the way through, instead of ignoring me, it would have been different. If the accounts had been adjusted at that time, would it not have been to your advantage?—As it turns out, yes. The Official Referee: It appears the contractors made no claim for extra work, and that no adjustment took place at all. In reply to Mr. Hudson, witness said no measurements of the excavations were made. Mr. Edward Salomon, architect, Manchester, said he had been 47 years in practice, and for 25 or 30 years he practised in London, as well at Manchester. He considered the Manchester method of taking out quantities much superior to the London system. In taking out quantities, he invariably left a margin for contingencies, and named the amount allowed. The priced bill of quantities belonged to the builder; but, to prevent any tampering, it was always placed under seal during the work, and sometimes in the architect's custody. An adjustment invariably took place at the conclusion of a job, and the priced quantities were then opened in the presence of the builder and the surveyor. It was utterly impossible to carry out a job without deviations, and the architect was right in using his discretion in setting one against the other. He thought it was to the general benefit of the clients of an architect of competency and experience that the latter should settle any differences in a broad way, and thus save the cost of measuring over the job when completed. There should always be an adjustment on the basis of the priced quantities, but it need not be a detailed statement in writing. Mr. John Holden, architect, Manchester, with 37 years' experience, corroborated. and added that in a large job it would be prudent on the part of the architect to have detailed accounts, not necessarily for his employers, but to satisfy himself. He should think this job necessitated very careful arrangements of the accounts. Mr. Samuel Warburton, builder and contractor, Miles Platting, spoke of the custom of allowances in quantities. In reply to Mr. Hudson, he said he was at present engaged on a £50,000 contract, for which Colonel Ellison was the architect. Mr. Segar, addressing the Court on behalf of the defendants, said the allegations of the plaintiffs meant that the architects had been receiving bribes from Messrs. Kelly Brothers, the contractors, as rewards for the defendants having loaded the quantities, and thereby given Messrs. Kelly Brothers a chance of getting a larger sum on the work. That was the gravamen of the charge, but there was not one single tittle of evidence to that effect. The action would not have been brought unless there had been a suspicion in the mind of somebody that Kelly Brothers were paying to the architects sums of money which ought not to have been paid. It was not suggested that the guardians had lost anything, and no one who had heard the case believed that the buildings as they now stood were of less value than the £9,700 paid for them. He pointed out, too, that the guardians had actually paid that money, knowing exactly what deviations had been made in the construction of the buildings. Such an action ought not to be favoured as the charging of an injury to the defendants for a wrong which the plaintiffs knew of ages before, and which they made no attempt to stop. He complained that Mr. Hallard, the clerk of the works, had treated the defendants very unfairly, letting them go ahead with the alterations in the contract without telling them that the guardians meant to hold them liable for the deviations. A number of things had either been miscalculations or left deliberately in the quantities as a margin in accordance with Messrs. Ellison's theory. The Official Referee: All the witnesses said they never heard of such a margin in excess in quantities. Mr. Segar said he must admit they had not proved such a custom of taking out quantities, but if the defendant believed he was doing his best for his clients there had been nothing unprofessional, nothing misleading, and nothing negligent. The Official Referee: He may be perfectly *bonâ fide* and yet may be negligent. Mr. Segar: Certainly, sir; but no damages can be obtained unless loss is proved. The specification and the contract were substantially carried out, the real difference arising in the non-carrying out of the quantities. There was a deal to be considered in the architect's position. He was the sole judge as to what was right or expedient with reference to the way in which the work was to be carried out, and undoubtedly he had a right to alter the quantities from time to time if he thought what he substituted was better for his client than what was put in the quantities, and to do that without giving a debtor and creditor account to anybody. It seemed to him to be a cruel action on the part of the guardians. If the deviations from the contract had made the building less valuable, they had been done with the leave and license of the guardians' committee. He asked that the case should be dismissed with costs. Mr. Hudson, in reply, said that overloading of the quantities was a most pernicious habit, and was not justified by any of the witnesses. Whatever the motive, such a principle and practice, if carried out, opened the door to all kinds of malpractices. In this case it was spread over 81 pages of quantities, and could not be traced by anyone but an expert, and then only with the greatest difficulty, because it was done on no definite system, but was most irregular. There were chimney-pots, enamelled bricks, and other things, which were never used at all. It had been shown that the price of the contract which the guardians ought to have paid was £7,790, and that would have been the amount of the tender instead of £9,428, and it would have covered all extras but for that overloading of the quantities. In addition, there were actual allowances of sums for contingencies, which made the excess £200 or £300 greater still. With regard to Mr. Hallard, he thought that witness had been most unjustly attacked. He had done his duty only, and, as a matter of fact, the correspondence and the evidence showed clearly that he did call the attention of the architects to the builders' deviations from the contract, and it was only upon the architects' assurance that those matters would be rectified on the adjustment at the completion of the job that he allowed them to proceed. With some corrections and allowances, the guardians' claim was for £1,524, but they were willing to take the amount at £1,065, the sum at which the defendants had reckoned the various items, and, as the guardians had no wish to press their claim heavily upon the defendants, they would be satisfied to accept a verdict of £1,000 with costs. He emphasised his opinion that the system of overloading quantities was a most pernicious one. It was to make the guardians lose. It was to make them pay £9,400 when it should have been about £7,600. It put everybody into a false position. The architects were able to say, "We have done the work without extras," whereas it was not the fact. The builders could afford to contribute £200 towards the architects' costs in the litigation over the lightning conductor, and all round there was a delusion as to what was the proper state of affairs. There was no proper statement of accounts submitted to the guardians, to which they, as representing the ratepayers, were fully entitled. He submitted, too, that, far from taking any advantage of the defendants, both Mr. Hallard and Mr. Miller, the solicitor, had treated defendants with very great care and fairness, and had given them every opportunity to meet the case. The Official Referee, in delivering judgment, said it was the duty of Mr. Ellison, as architect and surveyor for the guardians, to get out quantities for the purpose of getting tenders from builders for the execution of certain work required by the guardians. The allegation was that he failed to exercise due and reasonable care in taking out those quantities, whereby the guardians had to pay a much larger sum to the builder than they otherwise would have paid; and, further, that the quantities having been taken out in excess, Mr. Ellison, when the time came to settle up with the builders, did not exercise proper care in adjusting the accounts, so as to see that the guardians only paid for the work actually and properly executed, after allowing for the deviations and omissions from the contract. He entirely agreed with Mr. Hudson that the practice which appeared to have been adopted by Mr. Ellison, and which had been called overloading quantities, was one decidedly not to be encouraged. It seemed to him that it might give rise to very awkward and unsatisfactory complications of arrangements, and it certainly seemed to him not by any means to arrive at that which Mr. Ellison said was the object of doing it—namely, to protect his clients. So far as he could see, the guardians were not in any way benefited by that overloading of the quantities; in fact, the result must necessarily be, and was admittedly, that the tender of the builders was £1,065 more than it would otherwise have been. Mr. Ellison made it rather a ground of complaint that the quantities were not made part of the contract; but the quantities were given to the builders for the purpose of making out their estimate for the work to be done. The contract was for a lump sum, and he did not see how overloading the quantities could prevent any claim by the builders for extras, because no claims could possibly have been made for extras under the contract, unless it was something definitely ordered as extras. There might be some other way in which the guardians might benefit, but he could not see it. It could very well be that the contractors might benefit, but he would not go into that question. Then it was suggested that it was a practice known to the profession; but every one of the witnesses called both for the plaintiffs and for the defendants repudiated the notion that they had ever heard of having a margin to cover contingencies made out by adding to the quantities, or, as it was called, overloading the quantities. The custom was to add a definite sum for contingences, varying in amount between 4 and 6 per cent., which might be used or not as required, and which was deducted from the contract or added, according to whether it was requisitioned or not, when the adjustment was made by the architects at the end of the work. If Mr. Hallard's figures were correct, the contract price was in excess by £1,065, and there had been no suggestion that the figures were not correct. He entirely accepted Mr. Hallard's figures, and he saw no foundation for the assertion that Mr. Hallard was on the job improperly watching the architect's movements, and he did not understand the reference of Mr. Segar to "sham letters." His attention had never been directed to anything like sham letters by anyone on behalf of the guardians. It was obvious that if the quantities were overloaded by £1,065, the contract was in excess by that amount. Was it negligent for Mr. Ellison to overload the contract to that extent? There could not be two opinions about it. If the result was that the guardians had to pay £1,065 too much, could anybody doubt that it was negligent to take out quantities in that form? Certainly, he had not the slightest doubt it was negligent on the part of Mr. Ellison to do so. It was not a question of *bona fides.* A person might be perfectly *bonâ fide* and yet unutterably negligent, and for a gentleman who had had such a very large experience to make out quantities in such a way that when they were handed over to the contractors for the purpose of tendering the result was that the estimate put in for doing the work was in excess by £1,065 over what the work could be done for, showed very great negligence. Therefore, he could not undoubtedly but come to the conclusion that the plaintiffs had made out that Mr. Ellison in making out quantities in that way was guilty of negligence. Mr. Hudson had said his clients would be satisfied with a judgment for £1,000 and costs, and, therefore, his judgment would be for the plaintiffs for the sum of £1,000, which was a sum of £1,000 after giving credit for the balance due upon the counterclaim of £34, with costs on the claim and counterclaim.

* * *

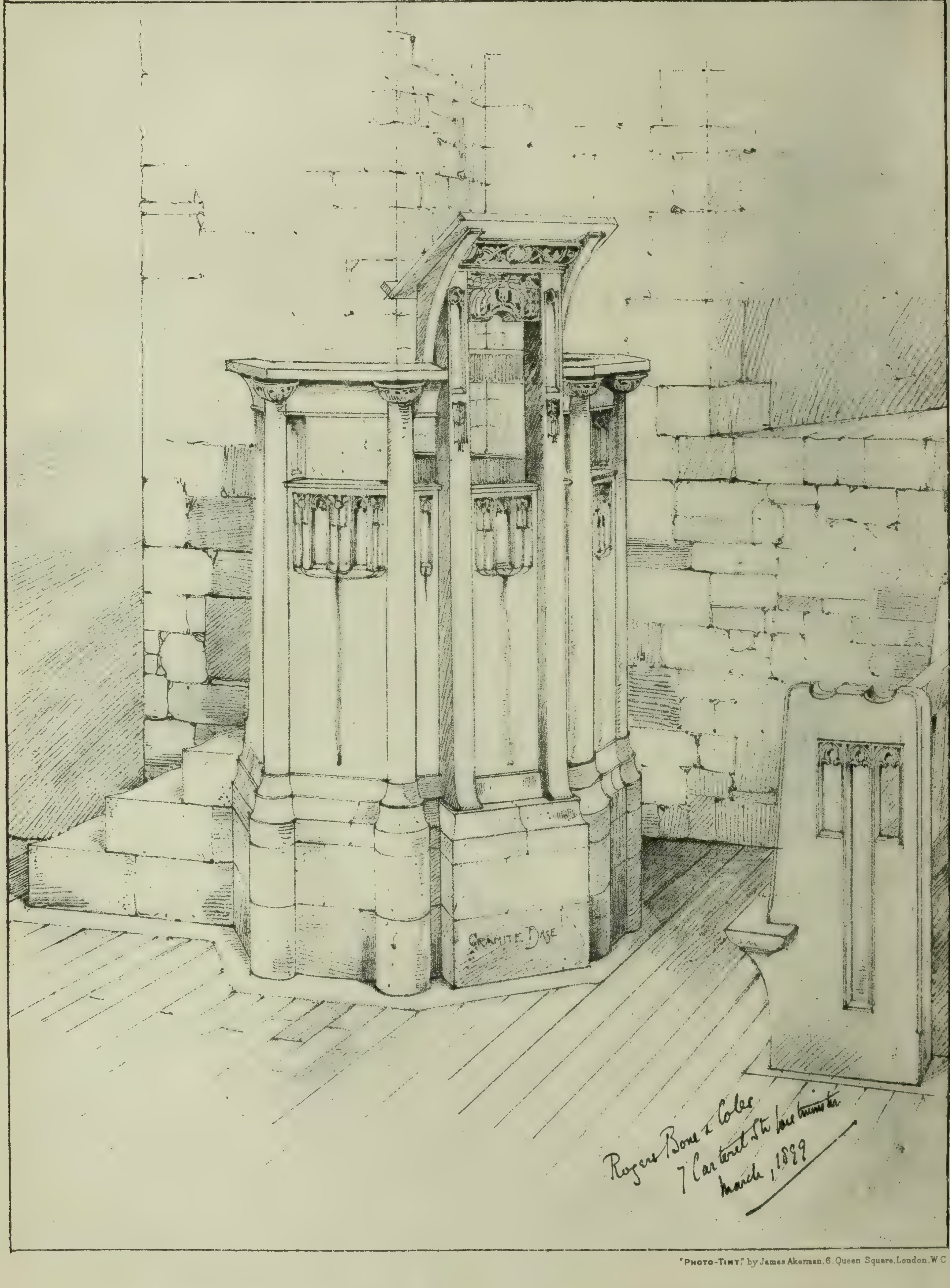
At the parish church of Chart Sutton, Kent, a stained-glass window was unveiled last week on the south side of the nave. Messrs. Lavers and Westlake, of Bloomsbury, are the artists, and the subject is "The Sermon on the Mount."

On Tuesday week an inquiry was held by Mr. C. Perrin, Local Government Board inspector, at Little Sutton, Cheshire, into an application by the rural district council to borrow £386 for sewerage works in Great Sutton, £5,280 in Little Sutton, and £193 in Overpool. Mr. F. E. Priest, the engineer, explained the plans.

A new United Presbyterian Church is about to be built in King-street, Dundee. It will be Late Perpendicular in style, having on one side a low square tower with pinnacles. Sittings will be provided for 700 persons, and the architect is Mr. T. Martin Capper, F.R.I.B.A., of Dundee.

·ST BRELADE'S CHURCH · JERSEY·

·DESIGN FOR PULPIT AND BENCH END IN NAVE·



"PHOTO-TINT," by James Akerman, 6, Queen Square, London, W.C.

·NEW FACTORY FOR THE BATH CABINET MAKING Co. SILCOCK & REAY ARCHTS.

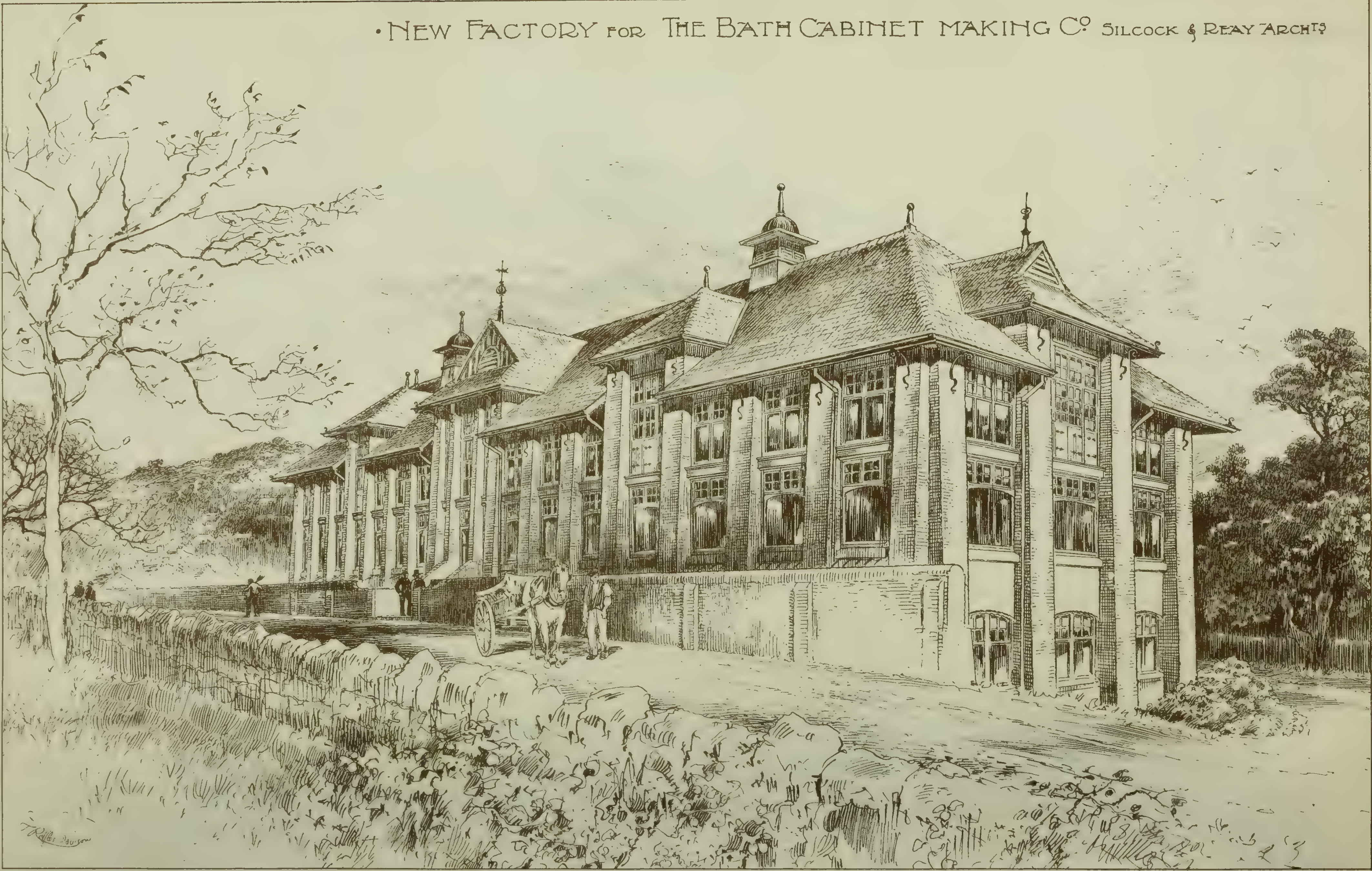


Photo-Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

- Carlton Hotel - Pall Mall

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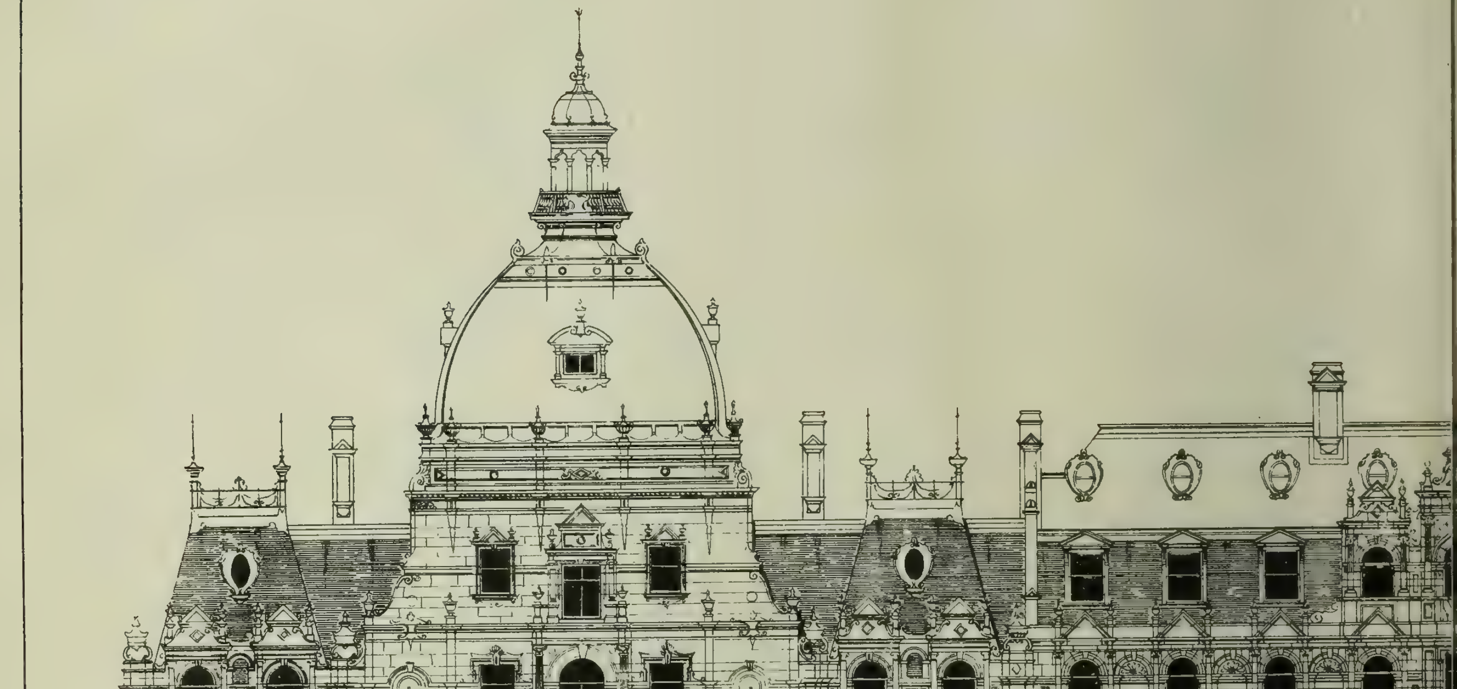
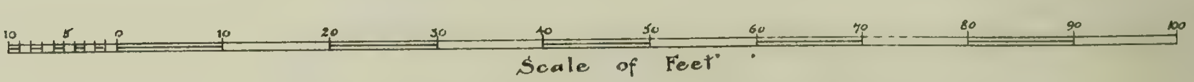
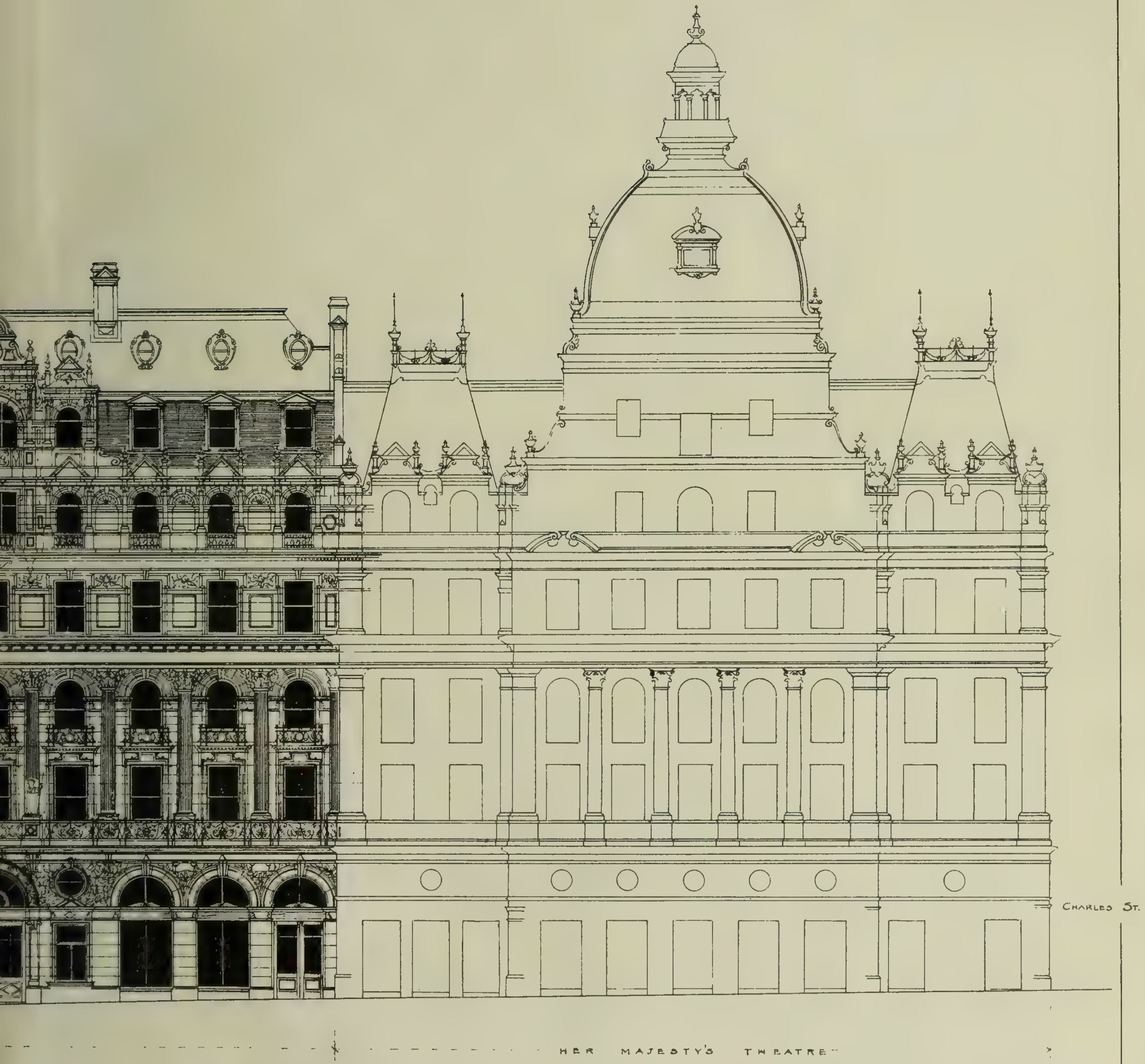


Elevation



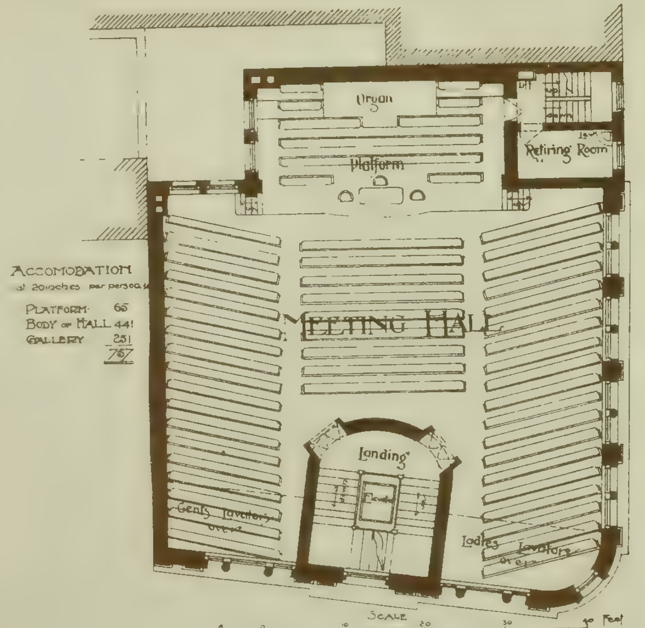
Architect·

: Florence · Architects·

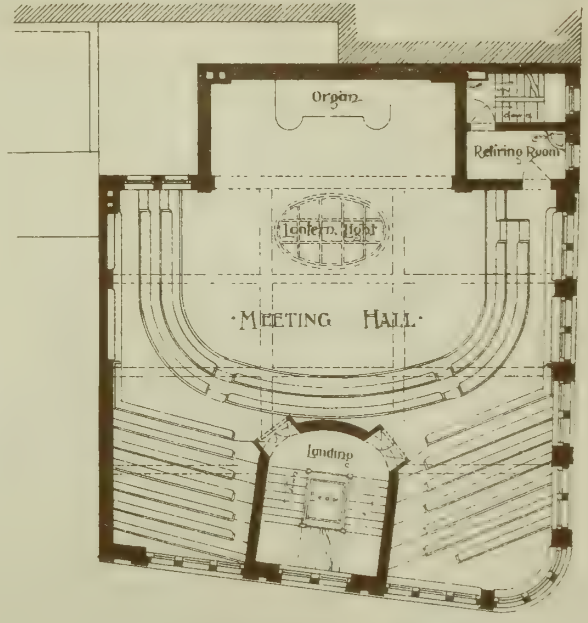


5 Haymarket.

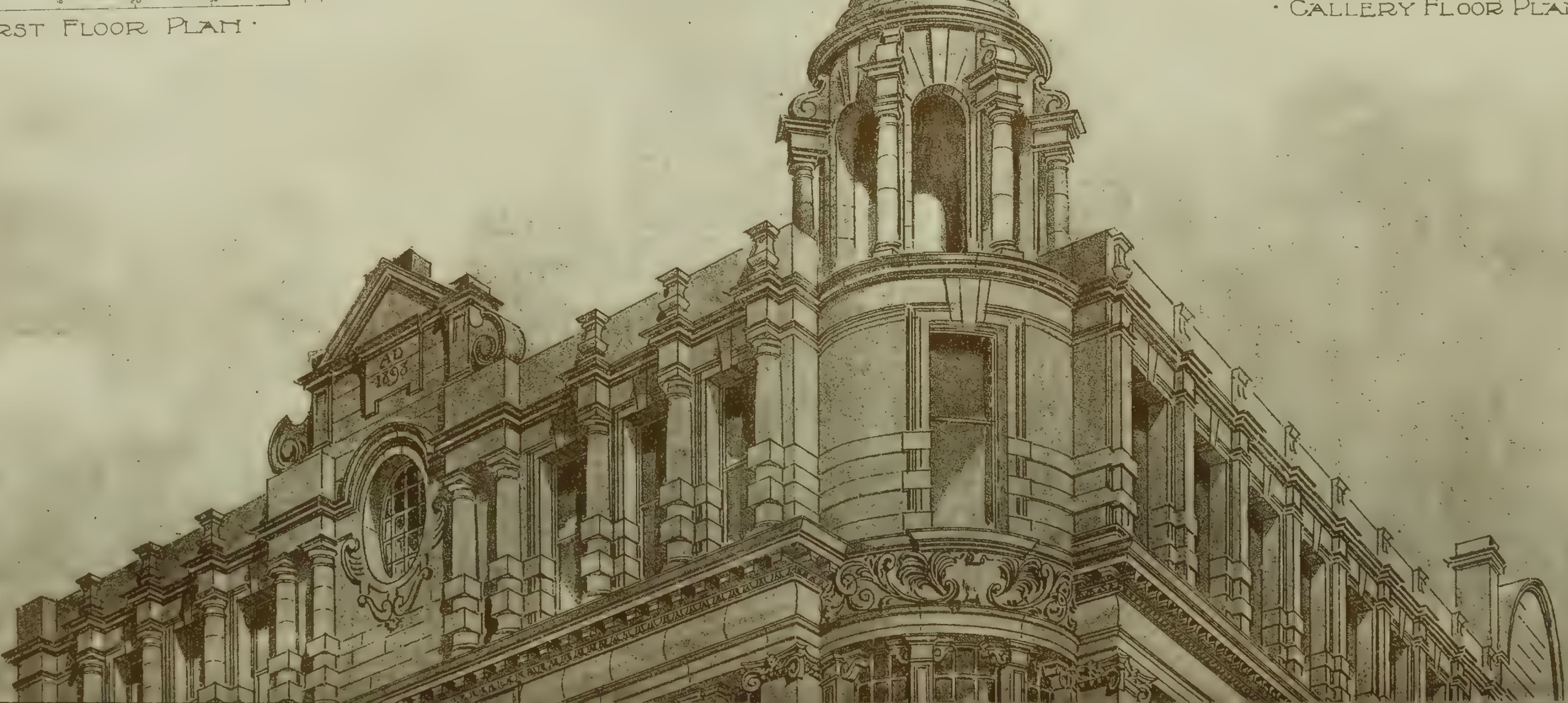
Photo-Lithographed & Printed by James Akerman 6, Queen Square, W.C.

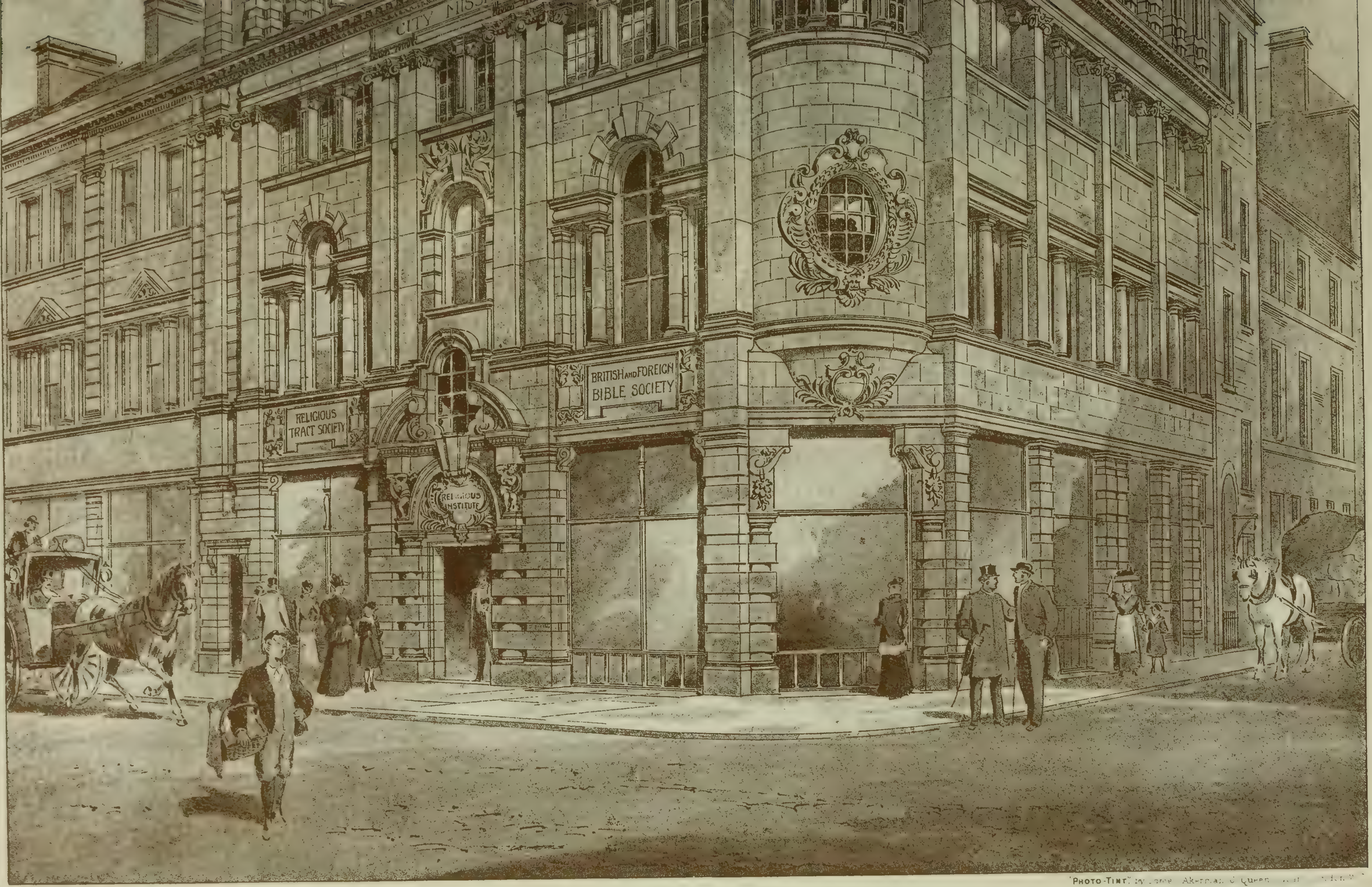


· FIRST FLOOR PLAN ·



· GALLERY FLOOR PLAN ·





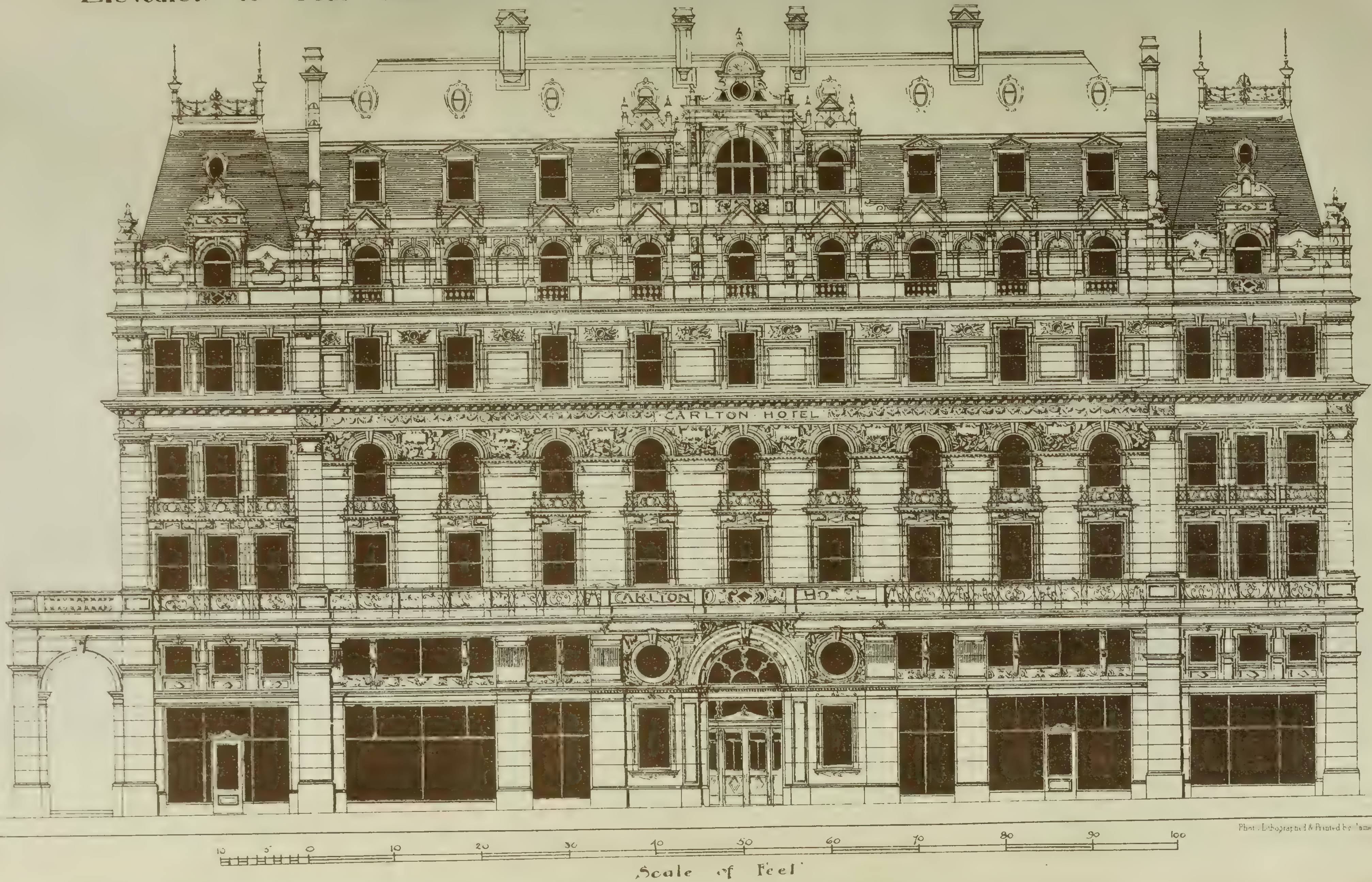
'PHOTO-TINT,' by James Akerman, 6 Queen [illegible] [illegible]

CITY MISSION RELIGIOUS INSTITUTE MANCHESTER WOODHOUSE & WILLOUGHBY ARCHTS.

Carlton Hotel - Pall Mall

C·J·PHIPPS F·S·A· L·H·ISAACS AND H·L·FLORENCE·ARCHITECTS·

Elevation to Pall Mall.



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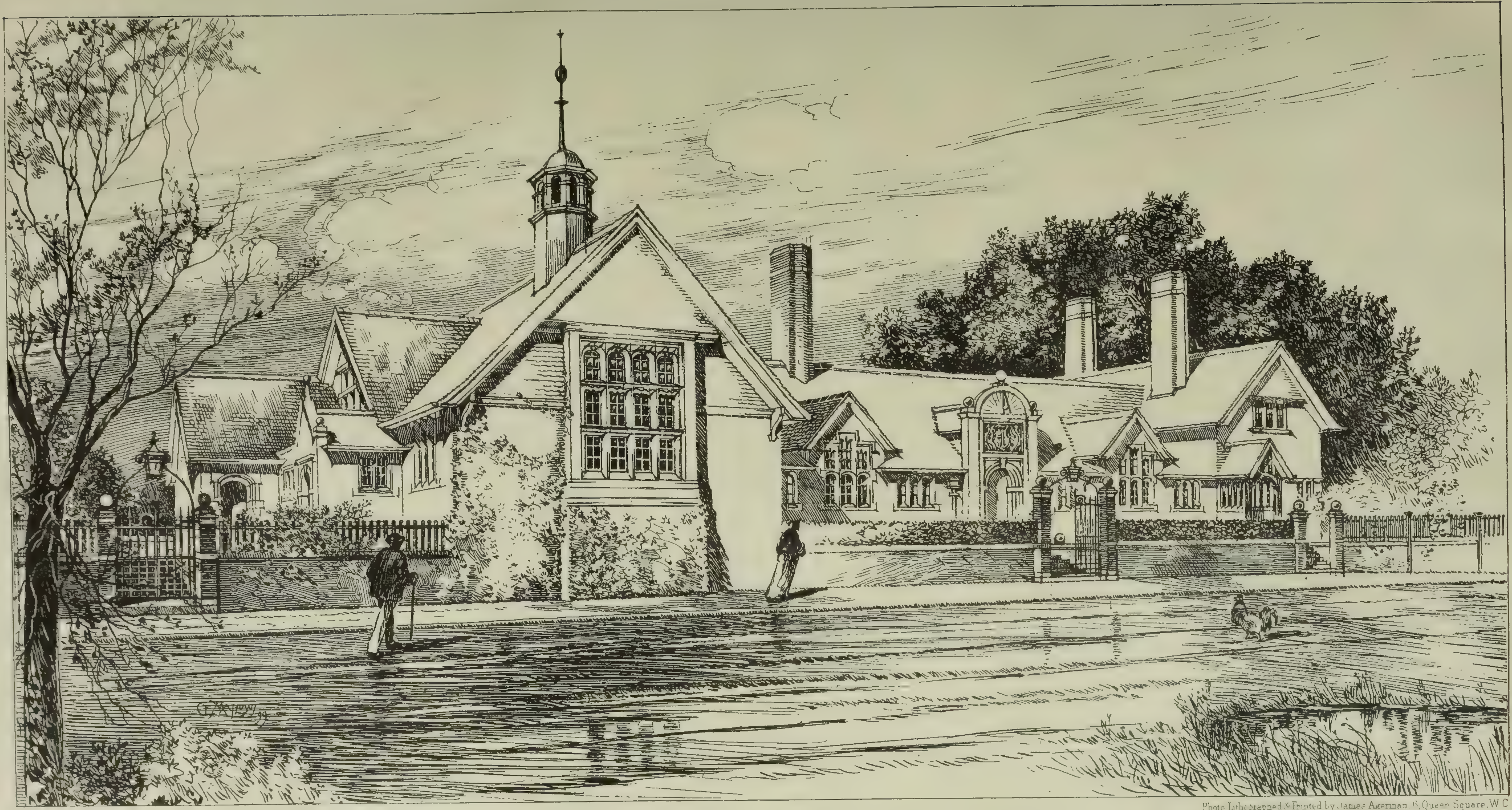

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· VILLAGE INSTITUTE TICEHURST SUSSEX · ASTON WEBB A·R·A· ARCHT

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ILLUSTRATIONS.

CITY MISSION RELIGIOUS INSTITUTE, MANCHESTER.—CARLTON HOTEL, PALL MALL.—NEW FACTORY FOR THE BATH CABINETMAKERS' COMPANY.—VILLAGE INSTITUTE, TICEHURST.—PULPIT AND BENCH END, ST. BRELADE'S CHURCH, JERSEY.—THE GORDON MEMORIAL COLLEGE, KHARTOUM.

Our Illustrations.

RELIGIOUS INSTITUTE, DEANSGATE, MANCHESTER.

THIS design was one submitted by Messrs. Woodhouse and Willoughby, FF.R.I.B.A., of Manchester, last year, in a limited competition, but without a professional assessor, under the motto "Evangel." The ground floor of the structure, which was planned to be four stories high, being devoted to shop premises, &c., the first floor to a large meeting-hall with retiring-rooms, kitchen, &c., and the second floor to suites of offices, board-room, &c.; the basement was designed for either a restaurant or mercantile purposes. The main staircase was to be of stone, and the building throughout of fireproof construction. The estimated cost was about £8,000.

THE CARLTON HOTEL, PALL MALL.

THIS building occupies part of the area formerly covered by the Opera House first established in London, and known as Her Majesty's Theatre. Part of the area occupied by the old Opera House and an adjoining club has been devoted to a new theatre, erected from the designs of the late Mr. C. J. Phipps, to which has been given the old name of Her Majesty's Theatre. This new theatre occupies the northern portion of the site, and has frontages to the Haymarket, Charles-street, and the Opera-arcade. The remainder of the site has been utilised for the purposes of a hotel and restaurant, to which has been given the name of "The Carlton." This building has frontages to the Haymarket, Pall Mall, and the Opera-arcade. The entrance to the hotel is in the Haymarket, whilst the *salle à manger* and restaurant are entered from Pall Mall. Taking these departments, for convenience sake, in inverted order, we would observe that the visitors pass from Pall Mall through a vestibule into an inner quadrangle, styled the Palm-court, which is covered with glass and is intended to serve for a lounge. At the end of the Palm-court, opposite to the Pall Mall entrance, is a terrace reached by marble steps, leading to the *salle à manger*. This terrace is protected by a gilt railing specially designed. The restaurant extends for the full width of the site from the Haymarket to the Opera-arcade. The north wall, facing the entrance, is artistically treated with a treillage which, in time, will be covered with foliage, whilst mirrors now reflect the effects of the room and its decoration. Private dining-rooms, for the entertainments of parties of from 20 to 40 in number, are also provided on this floor. A reading-room and a smoking-room, the latter provided with an ingle fireplace, are also to be found on the ground floor. The grill-room is in the basement, approached by a separate staircase and entrance from the Haymarket. Coming now to the hotel proper, which contains 316 rooms, including 72 suites each comprising two to six rooms, the visitors are received at the entrance hall, where will be found the inquiry and manager's offices, and the passengers' and luggage lifts. On the entresol floors are bedrooms for visitors and accommodation for the managerial staff of the hotel. The upper floors have been so planned that suites of apartments, resembling flats in the accommodation they afford, are provided, containing three, four, or five rooms, with bath-rooms, lavatories, and other conveniences. Throughout the building use has been made of asbestic plaster. Provisions satisfactory to the London County Council have also been made for rapid escape in case of emergency by staircases inside the building and an external iron staircase, which communicates with every floor from the roof downwards to the concrete flat over the opera arcade, from which iron ladders lead to Charles-street and Pall Mall. The keynote of the design externally was afforded by the late Mr. C. J. Phipps in the elevation for the Haymarket façade of Her Majesty's Theatre, and this has been followed by Messrs. Isaacs and Florence, who, on his demise, were instructed to design and supervise the works necessary to complete the hotel. The building has been erected by Mr. Henry Lovatt, of Wolverhampton. The pavement lights are by Messrs. Hayward Brothers and Eckstein. The carving was executed by Mr. Margetson, of Bristol.

NEW FACTORY FOR THE BATH CO-OPERATIVE CABINETMAKERS' COMPANY.

THIS building was erected in 1896 for the Bath Co-operative Cabinet Makers' Company by Messrs. Hayward and Wooster, of Bath, under the supervision of Mr. E. J. Trotman, clerk of the works. The materials used in the construction are Shortwood bricks in the piers and walls, wooden frames and casements, and the roof is covered with double Roman tiles; the turrets are of timber surmounted by small copper domes. In designing the building an effort was made to depart entirely from the usual bald ugliness of most factory buildings, and at the same time it was thought desirable to eliminate anything in the nature of decorative detail; the construction of the building—viz., the vertical battered piers, the horizontal girders forming the floors being left to tell their own tale. The architects are Messrs. Silcock and Reay, of Bath.

VILLAGE INSTITUTE, TICEHURST, SUSSEX.

THIS simple group of club and institute buildings for the village of Ticehurst has been designed by Mr. Aston Webb, A.R.A., the architect, with walls in red brick and tile-hanging to the upper parts. The façade is marked by a pleasing grouping of gables and chimneys. We have no exact particulars beyond these, as to the undertaking of which the architect has lent us the view.

ST. BRELADE'S CHURCH, JERSEY: DESIGN FOR PULPIT AND BENCH END.

THE architects' drawing of this pulpit is now on view at the Royal Academy. We illustrated the oak lectern in the same church, designed by the same architects, in our issue of Dec. 9, 1898. The pulpit is to be executed in oak, and to have a base of Jersey granite. The desk is to be made to slide up and down. Messrs. Rogers, Bone, and Coles, of Westminster, are the architects.

GORDON MEMORIAL COLLEGE, KHARTOUM.

(FOR description and further plans see page 4.)

* * *

A House of Lords' Select Committee passed, on Friday, the preamble of the Various Powers Bill of the London and Brighton Railway Company, which authorises improvements and extensions of Victoria Station at an estimated cost of about £1,000,000.

A new railway station on the Great Western system at Widney Manor, between Solihull and Knowle, was formally opened on Saturday. The adjoining land, part of the Lovelace Estates, is being laid out for building purposes. The station has been built by Mr. Pattinson.

A stained-glass window has been erected in the south transept of St. Cuthbert's Church, Edinburgh, by the Rev. James MacGregor, D.D., commemorative of his twenty-five years' ministry in that parish. The window, which has been executed by Messrs. Ballantine and Gardiner, of Edinburgh, has as its subject the Baptism of Our Lord.

COMPETITIONS.

CARDIFF.—At a meeting of the Cardiff Free Library Building Committee on Monday, Mr. H. V. Lanchester's report on the competitive plans submitted for branch libraries at Roath and Grangetown was received. The committee had fixed the limit of cost at £2,800 and £2,000 respectively. Mr. Lanchester reported that the plans which he had selected as worthy of the premiums could not be carried out at those figures. The best plan for the Roath building would, according to his estimate, cost about £3,500, and the second best £4,000, while the first and second plans for the Grangetown Library would cost about £3,400 and £2,800 respectively. The question was asked, if the committee accepted the plans, and it was found that they could not be executed at the figures named in the competition, would they have to pay the premiums? The town clerk was of opinion that the committee would not be liable to pay the premiums. It was then resolved to accept the two plans, and take the architects at their word that the cost would not exceed the stipulated price. The successful plans were those submitted for the Roath Library by Messrs. Tether and Wilson, Cardiff, and for the Grangetown building by Mr. E. M. Bruce Vaughan, Cardiff.

DUNDEE AND FORFAR FEVER HOSPITAL.—At a meeting of Dundee District Committee of Forfar County Council, held in Dundee on Friday, Mr. A. Gordon, of Ashludie, reported on the proposed joint hospital for Dundee and Forfar, stating that the architects to whom they proposed to award the premium were Messrs. M'Carthy and Watson, Edinburgh, and their plan would cost £8,740, although it was hoped to have the cost reduced to £8,000. When, however, everything was paid, the cost would not be less than £10,000. The report was adopted.

LEEDS.—The Markets Committee of the Leeds Corporation decided on Monday to appoint as assessor on the plans for the new markets Mr. William Emerson, P.R.I.B.A., who will be asked to select the six best designs sent in, and to report on their respective merits.

SALFORD.—At a special meeting of the Health Committee held on the 15th ult., the designs sent in for the dwellings to be erected on the barracks site were examined and adjudicated upon. Design No. 3, submitted by Mr. Henry Lord, F.R.I.B.A., of 42, John Dalton-street, Manchester, was awarded the first premium of £30. Design No. 11, submitted by Messrs. Ashley and Armstrong, 50, Berners-street, Oxford-street, London, W., was awarded the second premium of £20. Design No. 1, submitted by Messrs. W. R. Sharp and Fred Foster, 28, Deansgate, Manchester, was awarded the third premium of £10. This decision was approved by the council at its meeting this morning. The whole eleven sets will be on view at the Town Hall between the hours of 9.30 and 4.30 from Monday next, the 10th inst., to Saturday, the 22nd inst. Saturdays from 9.30 to 12.30. After the latter date the drawings will be returned, carriage paid, or sent to any address desired by the architects.

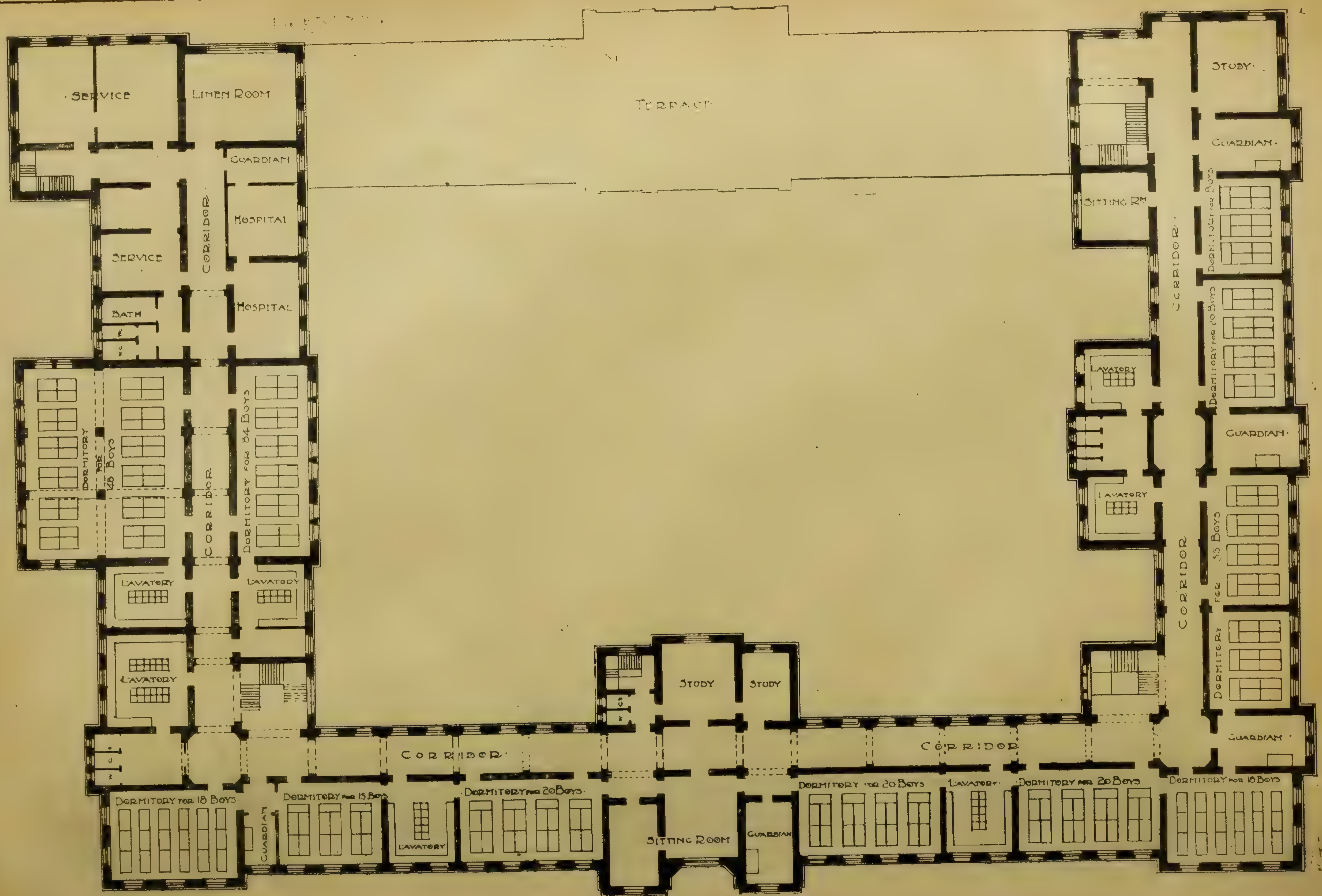
TOTNES.—Twenty-two sets of plans were sent in for the Cottage Hospital competition, those of Mr. E. Richard, of 3, Park-crescent, Torquay, being awarded the first premium. Mr. W. Henman, architect, Birmingham, was the assessor.

* * *

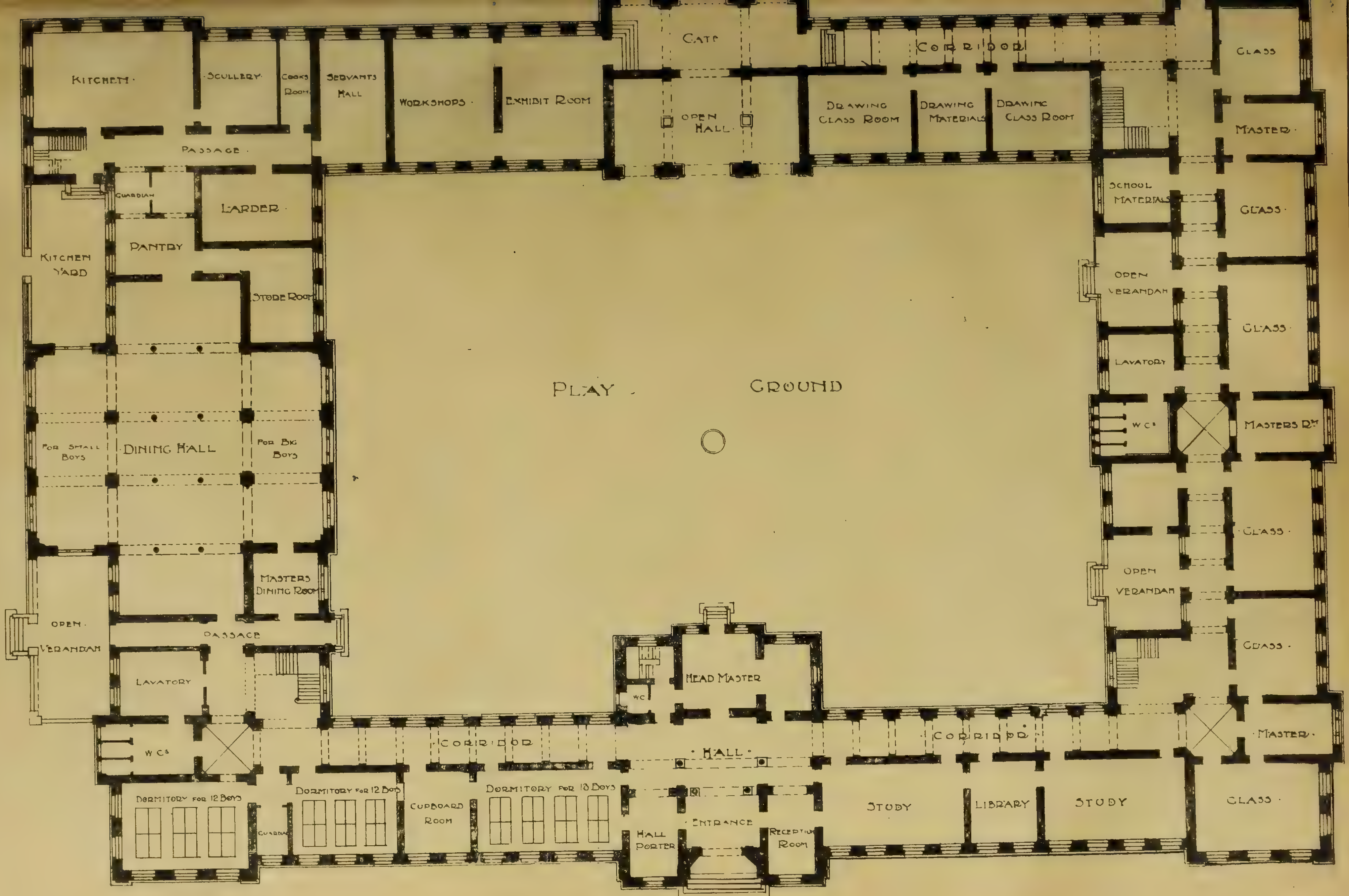
Mr. Charles Perrin, M.Inst.C.E., attended at the town-hall, Waterloo, Liverpool, to hear evidence in the matter of the inquiry directed by the Local Government Board in regard to the application by the urban district council to borrow £10,850 for the improvement of Crosby-road.

Mr. N. B. McDermott, F.S.I., chief surveyor, War Department, has just retired owing to the age limit, after a service of 38 years. He has been succeeded by Mr. B. R. Tucker, M.S.A.; who has already an experience of over forty years, including the stations of Canterbury, Dover, Walmer, Shorncliffe, Jamaica, London, and other places.

Although the number of estate auctions held during the past week was heavy, the aggregate realisation did not come up to general expectations, and was some £85,000 less than the sum total of the corresponding week last year. There was a good demand for freehold ground rents, and a fair demand for metropolitan and suburban investments, good prices being obtained for suburban business premises in main thoroughfares. The total returns for the week were £262,583.



· FIRST FLOOR PLAN ·



Ground Plan

Fabricius Bey Architect

THE GORDON MEMORIAL COLLEGE, KHARTOUM.

THE LATE PROFESSOR BANISTER FLETCHER.

We regret to announce the death, in his sixty-sixth year, of Mr. Banister Fletcher, J.P., D.L., F.R.I.B.A., M.S.A., V.D., C.C., of New Bridge-street, E.C., the district surveyor for West Newington, and the genial and well-read Professor of Architecture and Building Construction at King's College, London. Professor Fletcher took a chill some time since, when returning from a lecture on sanitary building construction delivered at the Technical School, Dublin; he had been able to continue his work at his office until Wednesday in last week, but had since been confined to bed, and died on Wednesday at his residence, Anglebay, West Hampstead. Born in 1833, the second son of the late Thomas Fletcher, Banister Fletcher was educated privately for the profession of architect and surveyor, and had an extensive and lucrative practice. His works include the new buildings at Wimbledon for King's College, opened yesterday (Thursday) by the Duke of Cambridge; the Café Royal, Regent-street; Haysman's International College, Finchley; Baptist Chapel at Wood-green; Wesleyan Chapel, Brockley; Primitive Methodist Chapel and Schools, Old Kent-road; "Stonecroft," "The Turret," "Ladywell," "Churchill," and other detached houses at West Hampstead; mansions at Kensington, Hendon, Hanwell, and other suburbs; the much-criticised business premises for Messrs. Spence in St. Paul's Churchyard—a Diamond Jubilee speculation, it will be recollected, of Mr. J. Neville Maskelyne, and many schools, warehouses, and houses. He claimed to have been the first architect to utilise faïence decoration for London façades. Mr. Banister Fletcher married in 1864 the only daughter of the late Mr. Charles Phillips, who survives him, as well as five sons and several daughters, and about five years ago he took into partnership his two elder sons, Mr. Banister Flight and Mr. Herbert Phillips Fletcher. The late professor joined the Royal Institute of British Architects as an Associate in 1860, and became a Fellow in 1876. He warmly advocated the movement for the Statutory Registration of Architects, and had been a member of the Society of Architects since 1892, and so far back as 1869 he became a member of the London Architectural Association, before which body he frequently lectured in earlier years. On the retirement in 1890 of Mr. Robert Kerr from the professorship at King's College, Mr. Banister Fletcher, who had for some time been a lecturer on architecture, was appointed as his successor, and he raised the number of students, and added, largely at his own cost, an excellent collection of architectural photographs, drawings, and casts, chiefly brought together during his travels in Greece, Turkey, Austria, and other parts of the Continent—to the library of the college. He took an active part in the work of the Carpenters' Company, and served a few years since as its Master. For years past he had given each session one or more of the series of free lectures to workers on carpentry, architectural history, or sanitation, delivered in the company's hall. His style was clear, his delivery easy and fluent, his points well emphasised, and illustrated by simple and rapidly-executed diagrams on the blackboard, and the discourses, if not marked by great profundity or originality, were instructive and interesting. He was also chairman of the Trades Training School Committee, and he had done good work as a member of the City of London Corporation, and served as chairman of the Sanitary Committee of that body. Since 1875 he had discharged the duties of district surveyor for West Newington and part of Lambeth. He was also a surveyor under the Board of Trade, and one of the arbitrators under the London Chamber of Commerce. These multifarious professional and municipal engagements by no means exhausted the energy of Mr. Banister Fletcher. He was a voluminous writer on professional topics, his works, the more important of which appeared first in our columns, including tabulated and well-indexed textbooks, on "Quantities," "Dilapidations," "Light and Air," "Arbitrations," and "Valuations and Compensations," which have gone through several èditions, and a handbook to the "London Building Act, 1894," and in conjunction with his son Mr. Banister Flight Fletcher, he recently wrote a lucid "History of Architecture," treated on the comparative method, and well illustrated. He was an active and enthusiastic volunteer, and was colonel of the Tower Hamlets Volunteer Rifles. He also sat in the short Parliament of 1885 as the Liberal member for the Chippenham Division, North-West Wiltshire; but at the election seven months' later he was defeated by Lord Henry Bruce. He again stood as a Gladstonian Liberal at Christchurch, Hants, in 1892; but, although he pulled down the Conservative majority, he failed to secure the seat. Among the clubs to which he belonged were the National Liberal, Junior Athenæum, and United Service Institution.

DISCUSSION ON ARCHITECTS' REGISTRATION AT SHEFFIELD.

A MEETING of architects was held at the Cutlers' Hall, Sheffield, on Friday last, under the auspices of the Society of Architects, the principal question dealt with being the registration of those in the profession. Mr. T. Walter L. Emden, President of the Society, was in the chair, and amongst others present were Mr. J. Smith, president of the Sheffield Society; Mr. Ellis Marsland, hon. sec. of the London Society; Mr. F. Vallance, Mansfield; Mr. W. R. Bryden, Buxton; Mr. C. McArthur Butler, secretary of the Society; and Messrs. C. B. Flockton, J. B. Mitchell-Withers, A. F. Watson, F. Cartwright, W. C. Fenton, J. R. Wigfull, W. G. Buck, W. Norton, G. Turner, J. A. Chapman, J. C. A. Teather, T. H. Pennington (Worksop), E. L. Hubbard (Rotherham), G. S. Haslam (Ilkeston), and J. Rollinson (Chesterfield).

The President said, without wishing to place themselves in the forefront of the battle which must necessarily take place over the question of registration in the architects' profession, the Society of Architects were holding these provincial meetings in order to obtain expressions of opinion on this important subject. He was anxious that the Royal Institute of British Architects should take up the question, but up to the present they had contented themselves with passing resolutions, and there were many who felt that the time for some action had now arrived. While doctors, dentists, and lawyers had their compulsory examinations, any man—a coalman, or an oil man, or anyone else could place a brass plate on his door announcing that he was an architect and surveyor. It seemed to him that examination and registration were necessary before this kind of thing could be stopped. In every other civilised country there was compulsory examination, but in England they were behindhand in this matter, which was not only of great importance to their profession, but also to the public at large.

Mr. Ellis Marsland read a paper on "The Statutory Registration of the Profession," contending that the advantages of registration would be the closing of the doors of the profession to incompetent men, raising the standard of the profession, and obtaining the confidence of the public and State recognition.

Mr. Vallance moved: "That this meeting cordially approves the principle of statutory examination and registration of architects, and is of opinion that it is desirable, in the interests of the public and the architectural profession, to promote a Bill in Parliament for the attainment of this object."

Mr. Wigfull seconded.

Mr. W. R. Bryden, in supporting, said they had been punished perhaps more than anybody as a result of this want of registration. The thanks of architects generally were due to the Society of Architects for taking up this matter.

Mr. W. C. Fenton believed that a large majority of the members of the Sheffield Society were in favour of registration. They did not want to go in opposition to the Royal Institute, to whom they were affiliated, but they would be glad if the Institute would take it up, not only in the interests of the younger members, but of the profession generally.

Mr. J. Smith agreed that Mr. Fenton had voiced the general opinion of the members of the Sheffield Society, but with the resolution in its present form he was afraid many of them would not agree. He did not think it was wise at this juncture to promote a Bill in Parliament. They had a great many leaders in the profession against them, and the Royal Institute, to say the least about it, was rather apathetic on the subject, and with such a division among themselves he was afraid that any Bill would be doomed to failure. He suggested an alteration in the resolution, by leaving out the reference to the promotion of a Bill.

Mr. G. S. Haslam approved of the resolution as it stood, believing that legitimate members of the profession could only protect themselves by such a method.

Mr. Mitchell-Withers did not think the time was ripe yet for the promotion of a Bill, and, moreover, sufficient explanation had not been given of the method of examination to justify them in supporting the resolution as it was submitted to them.

Mr. Buck thought it would be best to win over the Royal Institute before proceeding to Parliament.

Mr. Smith moved an amendment to take out the words after "registration of architects" and to substitute "and is in favour of every wise and practical effort being made to realise this registration."

Mr. Mitchell-Withers seconded this amendment.

Mr. Marsland expressed the opinion that the time had gone by for abstract resolutions.

The resolution was carried, the amendment only securing four supporters.

The President next read a paper on "The Rights of Light and Air," after which Mr. Smith moved, and Mr. Haslam seconded, "That with a view to lessening the costly litigation and delay now attendant upon questions relating to light and air arising out of building operations, it was desirable, in the interests of the public and the architectural profession alike, that all such questions should be submitted to and decided by a technical tribunal in connection with the local municipal authority, before the commencement of the work."

The Chairman said this plan had been tried in Scotland, had been in force there, in fact, for very many years, and had proved a great success.

Mr. Hubbard did not see why the local authority should interfere.

Mr. Mitchell-Withers moved that the words "in connection with the local municipal authority" be omitted, and this amendment was seconded by Mr. Wigfull.

The President, replying to questions, said the local authority would be by far the most convenient body, as the same set of plans which had to be submitted before buildings were commenced would do for the light and air examination. This technical tribunal could not be final, because a party not satisfied with the decision had recourse to the ordinary law, but in Scotland it was very rarely that the ordinary law was resorted to. The expenses in connection with the tribunal were very small indeed, because the gentlemen constituting the tribunal were experts, and therefore expert evidence was not needed, and much cost was saved.

The resolution was carried, only two gentlemen supporting the amendment.

Votes of thanks were accorded to Mr. Ellis Marsland and the President for their papers, and Mr. Emden, in responding, thanked the Sheffield friends for their reception.

CHIPS.

The widow of Mr. Ernest Claude Ayton-Lee, F.R.I.B.A., President of the Architectural Association 1880-1, died on Friday last at 82, Portsdown-road, Maida Hill, aged 52 years.

An inquiry was held at Stoke-on-Trent on Friday by Mr. W. A. Ducat, a Local Government Board Inspector, with respect to an application by the Stoke-on-Trent Town Council for sanction to borrow £2,700 for the improvement and drainage of Hartshill-road, £2,500 for market purposes, £1,060 for the public baths, £1,100 for works of surface-water drainage, £1,350 for the purposes of technical instruction, and £650 for works of sewage disposal, making a total of £9,360.

The Yorkshire Archæological Society made its first excursion yesterday (Thursday), when Skipwith, Bubwith, Wressle, and Hemingborough were visited.

At the town-hall, Southport, on Friday, Mr. Charles Perrin, M.I.C.E., held an inquiry on behalf of the Local Government Board into an application of the Southport Corporation to borrow £55,000 for the purpose of electric lighting and tramways. Mr. C. E. Taite, the electrical engineer, explained the proposals for lighting in detail, and Mr. R. P. Hirst, the borough surveyor, described the proposals for improving the tramways and working them by electricity.

Building Intelligence.

LEAMINGTON.—The Marquis of Northampton opened on Friday an extension of the Midland Counties Home for Incurables. Accommodation will eventually be provided for fifty-three additional patients, and for a new and larger chapel, a recreation-room, and more convenient domestic offices, at a cost of £17,000. The architects are Mr. Hawley Lloyd, of Leamington, and Mr. W. Henman, of Birmingham. It was decided that the scheme should be proceeded with in sections, and it was the first section—completed at a cost £7,300—which was opened on Friday. The new wards give room for thirty-three additional beds. The floors are of teak, laid on concrete. At the back of the new wing are a kitchen, servants' quarters, and domestic offices. The third section when completed will include the new chapel and recreation room, besides accommodation for twenty more patients.

PROFESSIONAL AND TRADE SOCIETIES.

THE INCORPORATED INSTITUTE OF BRITISH DECORATORS.—At a meeting of the general council of the Incorporated Institute of British Decorators, held at the registered office of the institute, Painters' Hall, Little Trinity-lane, E.C., on June 29, it was resolved "That this meeting desires to express its unanimous regret that the decorative treatment of the interior of St. Paul's Cathedral, so far as it has been carried, has paid too little respect to the architecture, and tends to disturb the structural effect, to the expression of which it should be the function of coloured decoration to contribute." Some seventy applications for new membership were brought before the council at this meeting, and about fifty of the applicants were elected Fellows, and a few were elected Associates of the institute. Amongst the members accepted by the council were Messrs. John Jackson and Edward Francis Jackson, of the firm of George Jackson and Son, of 49, Rathbone-place, W.; Mr. Samuel Alon, of the firm of Hampton and Son, Pall Mall, East; Mr. Ernest Henry Ruscoe, of the firm of Clarke and Mannooch,; Mr. Charles Albert Hindley, of the firm of Hindley and Wilkinson, Ltd., of 70, Welbeck-street, W.; Messrs. Whitehead, Bros., of Wimbledon. Mr. Thomas Kershaw Bonnar, of the firm of Bonnar and Son, of Edinburgh; Mr. H. Liley, of Radnor-place, and others. Mr. Wilfred Nicholson, of the Painters' Company, was elected an honorary member.

MUNICIPAL ENGINEERS' CONFERENCE. — The annual conference of the Incorporated Association of Municipal and County Engineers was opened at the Engineers' Institute, Cardiff, on Monday. Mr. W. Harpur, C.E., borough engineer of Cardiff, president, occupied the chair, and the engineers and surveyors of most of the counties and leading municipalities in Great Britain and Ireland were present. Prior to the business meeting the Mayor (Alderman Sir Thomas Morel) and members of the Cardiff Corporation received the members of the association at the Town Hall. The President (Mr. W. Harpur), in his inaugural address, said it was mainly to our large cities and towns that we had to look for improvements in the laws upon public health matters. These large cities and towns from time to time found it necessary to apply to Parliament for special powers to improve the governments of their districts; but when such applications were made it was the almost invariable practice of the Local Government Board to oppose any amendment to the existing laws. Was this the right attitude for a governing authority to take up? It seemed to him that the Local Government Board, by following these methods, belittled themselves, and it was to be hoped that ere long they would see the necessity of altering their method of procedure towards local authorities. Mr. C. H. Priestley, waterworks engineer, read a paper on "The Cardiff Water Supply"; Mr. R. Read, Gloucester, on "The Ventilation of Sewers and Drains"; Mr. R. Morgan, Pontardawe, on "Sewer Ventilation"; Mr. W. H. Savage, East Ham, on "House Drainage"; Mr. J. B. Wilson, Cockermouth, on "A Method of Augmenting the Delivery of Gravitation Mains," and Mr. Foster, Cardiff, on "Public Baths."

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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RECEIVED.—M. B. J. (Newcastle).—L. S. F.—G. G. and Son.—W. N. S. (Tadcaster).—R. H. L.—C. K. and Co.

"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"McGilligan," "The Lucky Star," "Butts," "Oak," "Thistle," "Honeysuckle," "Desdichado," "Vigornia."

Correspondence.

GAINS AND LOSSES AT THE INSTITUTE.

To the Editor of the BUILDING NEWS.

SIR,—Mr. Aston Webb's remarks at the presentation of the Royal Gold Medal at the last meeting of the R.I.B.A. afford another proof of *Qui s'excuse s'accuse*. Can he think that the Institute is better for the five uneventful and quiet years which only increased the list of Fellows by *eight*, resulted in the loss of *fourteen* Honorary Associates, and the small gain of *thirty-five* Associates, in despite of admissions through examinations? That architecture is unrepresented in the new schemes for the London and Birmingham Universities? That such a large proportion as two-thirds of the members of the Institute abstained from voting at the recent elections?—I am, &c.,

F.R.I.B.A.

Contracts have been let for the first section of the work of restoring Paisley Abbey. The amount involved is over £13,000, and the architect is Dr. R. Rowand Anderson, of Edinburgh.

The Milnrow Urban District Council having made application to the Local Government Board for sanction to borrow a further sum of £9,000 for the purpose of sewerage and sewage disposal, Mr. A. E. Sandford Fawcett, A.M.I.C.E., attended at the council offices on Thursday in last week to conduct an inquiry into the matter. Mr. J. E. Diggle, C.E., explained the proposals and plans.

Intercommunication.

QUESTIONS.

[12259.]—**Pebble-Dashing.**—What is the best way to form cement for outside stucco—i.e., for pebble-dashing, so that a dead white (not cream) may be obtained in the cement and the pebbles, spar, &c., then thrown on? The usual way here in the North is to render the wall ¾in. thick with Portland cement, and then throw on the pebbles, &c., and when this is set, to limewash the surface, which last process, to my mind, spoils the whole work, as the pebbles would look far better in their natural state, and not smeared over with limewash; and there is, further, the objection that the limewashing has to be redone at frequent intervals. A specification clause for this work would be of great service; but I cannot find even in your latest article on "Specifications," which appeared recently in the "B. N.," a single reference to "pebble-dashing," &c., or as to how to get the effect which I mention.—STUDENT R.I.B.A.

[12260.]—**Sea Sand.**—I have a job near the coast (Atlantic), where, as far as I can yet learn, the only available good sand is sea sand, which I am expressly forbidden to use. In the town where I practice, the bulk of the sand used in mortar and for the first coat of plaster is sea sand, and the plaster is finished off with lake fresh water sand for the better work washed, and with no apparent ill results. In my seaside job I believe I could (failing fresh-water sand) have my sea sand very adequately washed. I invite the opinion of experts as to the sufficiency of this? I may have my own opinion on the subject, but "in the multitude of counsellors there is wisdom," though not often promptitude of decision.—F. W. L.

[12261.]—**Side Windows.**—Is there any by-law to prevent a building owner making an opening in the side party-wall of his house which is above the roof of his neighbour? The wall is really an external wall above the roof. If a door was provided, would there be any objection? My neighbour has no objection; but can the local authority prevent?—IN DOUBT.

[12262.]—**Effect of Sea-Water on Cement.**—Is it true that Portland cement is seriously affected by sea-water? If so, is there any particular ingredient that will render it safe? I believe that the lime is the first attacked, and I have read somewhere the chemical action that takes place. Shall be pleased to hear of any practical suggestion. A great many sea-groynes are now largely composed of Portland cement.—LEARNER.

[12263.]—**Somersetshire.**—Is there any tour that will give an architectural student a good idea of this county? I know there are many fine churches and attractions of local scenery; but I should like to economise my time by taking a well mapped-out district that will serve as a good sketching-ground. Bath seems a good centre, also Wells. I should be glad of any hints.—TOURIST.

REPLIES.

[12258.]—**Architect's Liability.**—There can be no liability. The builder contracts with the owner, not the architect, who merely acts as an agent. The architect's certificate binds the owner, and if there is no fraud or collusion between the architect and contractor, the owner is bound to pay. Even when the architect makes a mistake and certifies for payment when he ought to withhold a certificate, the owner is bound by the mistake.—G. H. G.

CHIPS.

A movement is on foot at Enfield in favour of purchasing as an open space the grounds of the late Mrs. Philip Twells. They comprise about 35 acres, and the purchase price has been fixed at £25,000.

The Plymouth Corporation have decided to abolish their old cattle market and slaughter-houses, now situate in different parts of the town, and to lay out and erect a new cattle market with abattoirs, meat storage, &c., on lands they have recently acquired at Prince Rock, on the outskirts of the borough, and have commissioned Mr. H. J. Snell, architect, of Plymouth, to prepare the necessary plans.

Extensive alterations are being made at the Western Hospital for Consumption, Torquay, from the designs of Mr. E. Richards, architect, Torquay, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

At the last meeting of the City Court of Common Council it was decided to pay under agreements to be sealed £19,560 for the purchase of ground in the City for the purpose of carrying out public improvements. Of the total sum, £16,000 will be spent on the acquirement of the ground in front of Nos. 7 to 10, 19 and 20, and 96, Fleet-street. The public way in front of 26 and 27, Fetter-lane, will also be widened by the acquirement of ground for £600.

The practice of the late Mr. George Fleetwood, surveyor, of 3, New Court, Carey-street, Lincoln's Inn, will be continued at the same address by his son, Mr. George S. Fleetwood, in conjunction with Mr. Eversden, under the name of Fleetwood, Son, and Eversden.

The death is announced, at the age of seventy-eight, of Mr. George Graham, chief engineer of the Caledonian Railway. He was engaged in the laying out of the line, and was the oldest servant of the company.

Our Office Table.

Salisbury will be the headquarters of the thirteenth annual excursion of the Architectural Association, and among the places of interest to be visited are Tisbury, with its fine cruciform stone church, Place House, now a farm, but once a grange of Shaftesbury Abbey, and still possessing one of the finest barns in England; old and new Wardour Castles, the market town of Meare, and Motcombe Park, built by Mr. Ernest George for Lord Stalbridge. Other excursions will take the sketching students to the site of Old Sarum, Lake House (restored by Mr. Detmar J. Blow), Amesbury, Stonehenge, Inigo Jones's work at Wilton House, Downton, Nunton, and John Thorpe's masterpiece, Longford Castle.

General Sir John F. D. Donnelly, K.C.B., who since 1884 has occupied the position of secretary of the Science and Art Department, retired on Monday from his post under the rule providing for compulsory retirement when the age of sixty-five is reached. Before taking charge at South Kensington, Sir John served for about thirty years in the Royal Engineers; and he is one of the few officers who can claim to be Crimean veterans. In consequence of Sir J. Donnelly's retirement, the Duke of Devonshire, Lord President of the Council, has made the following appointments:—Sir George W. Kekewich, K.C.B., the present secretary of the Education Department, to be also secretary of the Science and Art Department; Captain W. de W. Abney, C.B., to be the principal assistant secretary of the Science and Art Department; Mr. W. Tucker, C.B., to be the principal assistant secretary of the Education Department.

In the forty-second annual report of the Trustees of the National Portrait Gallery, the Trustees record their regret that, owing to failing health, Mr. Leslie Stephen has felt compelled to resign his seat on the board. Lord Balcarres has been appointed in his place. The list of 636 donations or bequests is continued up to 681. The standing rule of the Trustees as to the lapse of ten years from the date of a person's decease has been suspended in the case of Mr. Gladstone and Sir John Peter Grant, in accordance with their previous decision as to Mr. Watts's munificent gift to the nation. The work has been completed of placing under glass all pictures within the reach of the public. The Trustees have viewed with considerable anxiety the great and continuous increase in the market price of all portraits painted by the Great Masters of the British School, both past and present. The annual grant of £750 for the purchase of portraits was insufficient to enable them to secure, except by good fortune, historical portraits by Sir Joshua Reynolds, Gainsborough, and other painters of equal eminence. In consequence, however, of the great rise in the value of fine works of art, whether of artistic or historical interest, the Trustees find themselves in danger of being debarred altogether from any hope of obtaining by purchase portraits of such quality in the future. They therefore addressed a memorandum to the Treasury on the subject, and, without making any immediate demand, asked that the matter should receive careful consideration. The attendance of the public continues satisfactory.

A Select Committee of the House of Lords have, after a long inquiry, passed the preamble of the Bill introduced by the Great Western and Great Central Railway Companies with the object of affording the Great Central Company a better means of entering London than they already possess, over the line of the Metropolitan Company. The scheme embraces the construction of a new line from Grendon Underwood to Princes Risborough by the two companies; thence to High Wycombe the route will be the line of the two companies already authorised, and thence to Northolt by a new line to be constructed by the two companies. From Northolt the Great Central Company will run over their own line to Neasden, and so into London by their existing line. The terms of compensation to the Metropolitan Railway Company are to be settled by arbitration in regard to the outlay between Quainton-road and Canfield-place, incurred for the purpose of providing for the Great Central traffic running over the Metropolitan line.

The Local Government Board has written to the Londonderry County Council, stating that, under the Grand Jury Acts, the maximum salary of the county surveyor was fixed at £600. The Board, in the absence of any reason for reduction, feel themselves unable to concur in the proposal of the council to fix the salary at £250. The Local Government Board consider the sum would not be sufficient, when account is taken of the large outlay which the surveyor must incur in respect of travelling expenses if the duties of his office are properly fulfilled. After discussions and divisions, the council fixed the salary at £350.

The Parks Committee of the London County Council being dissatisfied with the recent decision of the Council to retain on the new recreation ground at Bromley-by-Bow the old Tudor house, known as Rutty's house, intend to make a further effort to effect its removal. In a report on the subject they state that, having again visited the building, they are still of opinion that it should be removed. The area of the land, including the site of the house, is less than 1½ acre, and they consider it undesirable that such a small space in a thickly crowded district should be further restricted by allowing any house to remain upon it. They mention that the interior of the house is in such a dilapidated state that to restore it would mean to rebuild it, in which case any historic interest would be lost, while if the building were retained for the purpose of being used as a public library such structural alterations would have to be made that few, if any, of the interior fittings of the house would remain. Considering, therefore, that the house in its present state could serve no useful purpose, and that if restored its construction would preclude its use as a public building, and considering also that the Council purchased the land for the purpose of an open-air recreation-ground, the committee are strongly of opinion that the building should be cleared away and the site used as an open space.

* * *

THE ARCHITECTURAL ASSOCIATION.

JULY 15th.—VISIT to GRAEME'S DYKE, near Harrow Weald (Mr. R. Norman Shaw, R.A., Architect). Train leaves Euston at 2.20 p.m. Members to assemble in the Hall at 2.5 p.m. P.O. 2s. to be sent to Mr. F. D. CLAPHAM, Fryern House, Eltham, by July 13th.

G. B. CARVILL
R. S. BALFOUR } Hon. Secs.

* * *

CHIPS.

The laying of the first stone of the new hospital at Boscombe, Bournemouth, was carried out on Friday with full Masonic ceremony. The plans for the new hospital consist of an administration block and three pavilions. Two pavilions are now to be erected, and the estimated cost is £8,000, towards which one-half has been received.

Wesley's Chapel in the City-road, London, will be reopened by Lord Strathcona, High Commissioner of Canada, to-day (Friday). The memorial sculpture to the late Rev. Dr. Moulton, by Mr. Adams-Acton, will be unveiled by Sir Henry H. Fowler, M.P. It consists of a white statuary marble bust, placed within a framed alcove of white Carrara marble. The electric light has been installed in the place of gas.

The extensions to the Butler-street schools, Liverpool, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The new Queen's Head Hotel adjoining the Westcliff Station at Southend-on-Sea was opened last week. Mr. James Thompson (of Messrs. Thompson and Greenhaigh, of Southend), is the architect, and Mr. A. E. Symes, of Stratford, the contractor.

The Tudor Hotel, situated near the Princess's Theatre in Oxford-street, was opened on Tuesday. The entrance hall is used as a lounge, with lined marble walls and pillars, carved oak appointments, and easy-chairs, settees, &c., while on the upper are well-furnished bedrooms. Altogether there are some 200 rooms in the hotel.

The Duke and Duchess of York opened on Tuesday a new wing of the Albert Memorial Museum and School of Art at Exeter. The building, originally commenced in 1865, and opened three years later, has been enlarged in 1870, 1884, and 1891, and has cost, first and last, for structural works, a total of £35,000. Messrs. Tate and Harvey, of Exeter, are the architects of the present extension, and the carving has been executed by Messrs. Harry Hems and Sons, of that city. When 33 years ago the first portion of the Museum was erected, from designs by the late Messrs. John Hayward and Sons, of Exeter, Mr. Harry Hems was brought down from London to do the sculptured work, and he has dwelt and worked in the Ever-Faithful city ever since.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	7 5 0	,,	8 5 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£10 15 0	...	£11 0 0
Best ditto	11 5 0	...	11 10 0

	Per ton.		Per ton.
Cast-Iron Columns	£6 10 0	to	£9 0 0
Cast-Iron Stanchions	6 10 0	,,	9 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	11 10 0	,,	12 10 0
Cast-Iron Sash Weights	4 12 6	,,	4 15 6
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 7 6	to	£6 12 6
4in. to 6in.	6 2 6	,,	6 7 6
7in. to 24in. (all sizes)	5 12 6	,,	5 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 2 6	,,	17 2 6
Pig Lead, in 1cwt. pigs	15 7 6	,,	16 7 6
Lead Shot, in 28lb. bags	19 0 0	,,	20 0 0
Copper Sheets, sheathing and rods	83 0 0	,,	84 0 0
Copper, British Cake and Ingot	79 0 0	,,	79 10 0
Tin, Straits	106 0 0	,,	107 0 0
Do., English Ingots	117 0 0	,,	118 0 0
Spelter, Silesian	25 10 0	,,	26 0 0

TIMBER.

Teak, Burmah	per load	£13 5 0	to	£16 5 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	4 7 6	,,	6 10 0
,, Oak	,, ...	4 10 0	,,	6 5 0
,, Birch	,, ...	2 5 0	,,	3 0 0
,, Elm	,, ...	4 12 6	,,	5 15 0
,, Ash	,, ...	3 2 6	,,	4 7 6
Dantsic and Memel Oak	,, ...	3 5 0	,,	4 0 0
Fir	,, ...	1 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	3 15 0	,,	6 5 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	4 0 0	,,	15 0 0
Sequoia, U.S.A	...per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3¾	,,	0 0 4½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£19 0 0	to	£25 10 0
,, 2nd	14 0 0	,,	17 5 0
,, 3rd	6 15 0	,,	10 0 0
Canada Spruce, 1st	8 5 0	,,	10 5 0
,, 2nd and 3rd	7 0 0	,,	8 5 0
New Brunswick	7 0 0	,,	7 15 0
Riga	8 5 0	,,	9 5 0
St. Petersburg	10 0 0	,,	14 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 15 0	,,	10 10 0
White Sea	11 0 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 11 6	,,	£0 14 9
2nd ditto	0 10 0	,,	0 10 9
Other qualities	0 5 3	,,	0 6 6
Staves, per standard M:—			
Quebec pipe	—		—
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per ton.	£20 2 6	to	£20 12 6
Rapeseed, English pale	,, ...	23 5 0	,,	23 10 0
Do., brown	,, ...	21 15 0	,,	22 0 0
Cottonseed, refined	,, ...	16 10 0	,,	17 5 0
Olive, Spanish	,, ...	30 0 0	,,	32 0 0
Seal, pale	,, ...	18 0 0	,,	18 5 0
Cocoanut, Cochin	,, ...	28 0 0	,,	28 5 0
Do., Ceylon	,, ...	25 0 0	,,	25 10 0
Palm, Lagos	,, ...	24 0 0	,,	24 5 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6	,,	0 0 6½
Tar, Stockholm	per barrel	1 0 0	,,	1 6 6
Do., Archangel	,, ...	0 18 0	,,	1 0 0
Turpentine, American	per ton	28 15 0	,,	29 0 0

LIST OF COMPETITIONS OPEN.

London, W.C.—Electric Lamp Standards and Brackets	£10, £5	G. Green, Surveyor to Vestry, Town Hall, Charing Cross-rd., W.C.	July 8
Plumstead—Municipal Buildings and Public Library, Glossop-road (cost £40,000; E. W. Mountford, F.R.I.B.A., Assessor)	£100, £75, £50	Edward Hughes, Clerk, Vestry Hall, Maxey-road, Plumstead	,, 27
Halifax—Twelve Shops, Commercial-street	£50, £25	Barstow and Midgley, Solicitors, 8, Harrison-road, Halifax	Aug. 1
Watnall Chaworth and Watnall Cantelope—Sewerage Schemes		C. J. Spencer, Clerk, Public Offices, Basford, Notts	,, 17
Kircaldy—Infectious Diseases Hospital, Fosterton Farm	No premium	Alexander Beveridge, District Clerk, Kircaldy	,, 17
Wharfedale—Isolation Hospital	£30 (merged), £15	C. V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Dunoon, N.B.—Sheriff Court House (£5,000) and Police Buildings (£3,500)	£30, £20	M. Sinclair, County Clerk, Lochgilphead	—
Crystal Palace—Bandstand (Assessor)	30gs., 15gs., 7gs.	W. Gardiner, Sec., Crystal Palace Co., Sydenham, S.E.	—
Beeston—Church and Sunday Schools		C. Nichols, St. John's-grove, Beeston, Notts	—

LIST OF TENDERS OPEN.

BUILDINGS.

Wallsend—Shops and House	B. R. Jobling	Benjamin F. Simpson, F.R.I.B.A., 12, Grey-street, Newcastle-on-T.	July 8
Rye—Wesleyan Sunday School		A. Willmer Pocock, Architect, London	,, 8
Acton, W.—Strong Room at Offices	Acton District Council	D. J. Ebbetts, Surveyor, 242, High-street, Acton	,, 8
Torrisholme—Two Houses and Shop		J. Cole, Green House Farm, Torrisholme	,, 8
Barnstaple—Shop, Boutport-street	Symons and Son	Fredk. W. Petter, A.R I.B.A., Barnstaple	,, 8
Halifax—Foundry		W. G. Gray and Son, Architects, 28, George-street, Halifax	,, 8
Saltley—Engine-Shed, &c.	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	,, 8
Enniskillen—Alterations, Wheathill Methodist Church		Thomas Elliott, Enniskillen	,, 8
Glenlivet—Bank Offices, &c.	North of Scotland Bank, Ltd.	Charles C. Doig, Architect, Elgin	,, 8
Slains—House, East Broadleyhill		William Nicol, Forester, Cluny	,, 8
Beeston—House	John H. Topham	T. A. Buttery and S. B. Birds, Architects, Morley	,, 8
Tilney All Saints—Wesleyan Chapel		Rev. W. Millican, Valinger-road, Lynn	,, 8
Higher Ashe—Repairs to Farmhouse	J. Preston	White and Colley, Land Agents, Wrangaton, South Brent	,, 8
Sandbach—Detached Villa, Middlewich-road		Alfred Price, Architect, Sandbach	,, 8
Heywood—Offices, Workshop, &c.	Heywood & Middleton Water Board	James Diggle, C.E., Waterworks Offices, Heywood	,, 8
Brymbo—Alterations at Bryn Zion Independent Chapel		Davies and Moss, Architects, 11, Regent-street, Wrexham	,, 8
Penzance—House on Minney Estate	J. Willey	Henry Maddern, Architect, 26, Clarence-street, Penzance	,, 8
North Seaton—Twenty Cottages and Business Premises		B. F. Simpson, F.R.I.B.A., 12, Grey-street, Newcastle-on-Tyne	,, 8
St. Albans—Alterations to Court House	Hertfordshire County Council	Urban A. Smith, County Surveyor, 41, Parliament-street, S.W.	,, 8
Torrisholme—Farm Buildings		J. Cole, Green House Farm, Torrisholme	,, 8
Buxton—Five Shops, &c., The Quadrant	Duke of Devonshire, K.G.	W. R. Bryden, F.R.I.B.A., 1, George-street, Buxton	,, 8
Coachford—Rebuilding Licensed Premises		Daniel Dinneen, Vintner, Coachford	,, 8
Abertillery, Mon—Fifty Cottages	Brynawell Building Club	E. Williams, Architect, Andrew's Buildings, Cardiff	,, 8
Burghead—Alterations to Premises		William Mackintosh, Architect, Inverness	,, 8
Lancaster—Mason's Work for New Girder Bridge over Canal	Streets Committee	The Borough Surveyor, Market-square, Lancaster	,, 10
Ravensthorpe—Classroom at St. Saviour's Girls' School		John Kirk and Sons, Architects, Dewsbury	,, 10
Curragh Camp—Post Office	Board of Public Works	H. Williams, Secretary, Office of Public Works, Dublin	,, 10
Sleights—Bungalow		G. S. French, Architect, 1, West-terrace, Whitby	,, 10
Gloucester—Ventilating Widden-street Board Schools	School Board	H. Medland, F.R.I.B.A., Gloucester	,, 10
Porthcawl—Children's Convalescent Home		E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	,, 10
Benwell—Alterations to Gardener's Cottage	Urban District Council	W. P. Pattison, Surveyor, Council Offices, Atkinson-road, Benwell	,, 10
Salford—Wards, &c., at Ladywell Sanatorium	Health Committee	Henry Lord, Architect, 42, John Dalton-street, Manchester	,, 10
Carlisle—Alterations to Business Premises, Devonshire-street		T. Taylor Scott, F.R.I.B.A., Architect, Carlisle	,, 10
Preston—Alterations, &c., Grammar School	Corporation	The Borough Surveyor, Town Hall, Preston	,, 10
Morecambe—Six Houses, Ardlamont-road	J. H. Wilsdon	Marshall Bros., Architects, Back-crescent, Morecambe	,, 10
Stairfoot—Seven Houses		Duncan and Jones, Stairfoot	,, 10
Belvedere—Four Classrooms, Picardy Schools	Erith School Board	Ford, Son, and Burrows, Architects, 21, Aldermanbury, E.C.	,, 10
Aberdare—Reslating Roof of Market	Aberdare Markets & Town Hall Co.	Thomas Roderick, Architect, Aberdare	,, 10
Forres—Alterations to Mechanics' Institute		John Forrest, Architect, Forres	,, 10
Preston—County Sessions Hall	Lancashire County Council	Henry Littler, Architect, County Offices, Preston	,, 10
Leeds—Boiler-House, &c., at Workhouse, Beckett-street	Guardians	Thomas Winn, Architect, 92, Albion-street, Leeds	,, 10
Utley—House		Henry Smith, Architect, Compton Buildings, Keighley	,, 10
Birkenhead—Operation Ward, Workhouse	Guardians	Edmund Kirby, Architect, 5, Cook-street, Liverpool	,, 10
Gloucester—Repairs to Barn at Hollybed Farm	J. C. Colston	Thomas Cadle, Surveyor, Lynwood, Denmark-road, Gloucester	,, 10
Kensal Rise—Wesleyan Church		W. J. Morley, Architect, 269, Swan-arcade, Bradford, Yorks	,, 10
Selly Oak—Steward's Office, &c.	Guardians of King's Norton	Whitwell and Son, Architects, 23, Temple-row, Birmingham	,, 10
Pimlico—Boiler Seatings, Economiser Chamber, Flues, &c., at Western Pumping Station, Grosvenor-road	London County Council	The Engineer's Department, County Hall, Spring-gardens, S.W.	,, 11
Keighley—School at St. Anne's	Very Rev. Canon Watson	John Judson and Moore, Architects, York Buildings, Keighley	,, 11
Penge, S.E.—Engine-Shed, Beckenham-road	Lewisham Board of Works	The Offices (Surveyor's Dept.), Lewisham Town Hall, Catford	,, 11
Frome—Hospital and Nurses' Home		B. Vaughan Johnson, Architect, 20, Victoria-st., Westminster, S.W.	,, 11
Strabane—Extension of Board Room	Guardians	J. E. Sharkie, Clerk, Board Room, Strabane	,, 11
Leeds—Additions to Woodpecker Inn, York-road	Edmund Jowett	Charles D. Swale, Architect, 98, Albion-street, Leeds	,, 11
Gildersome—Repairs to Board Schools	School Board	T. A. Buttery and S. B. Birds, Architects, Queen-street, Morley	,, 11
Hoylake—Alterations to Infants' School		H. and A. P. Fry, Architects, 18, Hackins Hey, Liverpool	,, 11
Northampton—Additions to County Buildings	County Council	Henry Philip Markham, Clerk, County Hall, Northampton	,, 11
Aylesbury—Repairs at Workhouse	Guardians	F. B. Parrott, Clerk, 16, Bourbon-street, Aylesbury	,, 11
Stainland—Slaughter-house, &c.	Industrial Society	J. Berry, Architect, 9, Queen-street, Huddersfield	,, 11
Brixham—Two Cottages, Kingston Farm		W. F. Tollit, Architect, Gate House, Totnes	,, 12
Keighley—Pavilion at Workhouse Infirmary, Fell-lane	Guardians	John Judson and Moore, Architects, York Buildings, Keighley	,, 12
Bishop Auckland—Rebuilding Market Hotel, Newgate-street		Wm. Duncan, Architect, Middlesbrough	,, 12
Ringwood—Additions to Police Station	Hants County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	,, 12
Lancaster—Building Nos. 9 and 11, Lower Church-street		J. Parkinson, Architect, 67, Church-street, Lancaster	,, 12
Cymmer—Infectious Diseases Hospital	Glyncorrwg Urban District Council.	George F. Lambert, Architect, Bridgend	,, 12
Keighley—Workshop in Bradford-road		B. Hopkinson & Co., Architects, Craven Bank Chambers, Keighley	,, 12
Benfieldside—Alterations, &c., to Sewerage Works	Urban District Council	John Dixon, Surveyor, Bank Buildings, Shotley Bridge	,, 12
Fareham—Additions to Police Station	Hants County Council	W. J. Taylor, County Surveyor, The Castle, Winchester	,, 12
Barrow-in-Furnace—Abattoirs, Crellin-street		The Borough Engineer, Town Hall, Barrow-in-Furnace	,, 12
Shoreditch, E.C.—Workshops, &c., Flemming-street Depot	Vestry	The Vestry Surveyor, Town Hall, Old-street, E.C.	,, 12
Bittadon—Chapel		Alex. Lauder, Architect, Barnstaple	,, 13
Kendal—House at Bannel Head	J. Richmond	Stephen Shaw, F.R.I.B.A., Kendal	,, 13
Warkworth—Residence and Stable		W. T. Hindmarsh, Solicitor, 26, Bondgate Without, Alnwick	,, 13
Ilford—Corrugated Iron Temporary School (600 places)	School Board	C. J. Dawson, F.R.I.B.A., 7, Bank Buildings, Ilford	,, 13
Milton Brodie—Additions to Muirhead Farmhouse		Charles C. Doig, Architect, Elgin	,, 13
Walsall—Additions to Tramp Wards at Workhouse	Guardians	H. E. Lavender, Architect, Bridge-street, Walsall	,, 13
Bacup—Alterations at Assembly-Room of Co-operative Store		The Secretary, Registered Office, Rochdale-road, Bacup	,, 13
Darwen—Fourteen Artisans' Dwellings, Kelvin-street	Corporation	Woods and Thackeray, Architects, Darwen	,, 13
Arnside—Enlarging the Wesleyan Church		Stephen Shaw, F.R.I.B.A., Kendal	,, 13
Durham—Alterations to Assize Court	County Council	William Crozier, A.M.I.C.E., County Architect, Durham	,, 13
Millstreet—Repairs to Labourers' Cottages	Rural District Council	T. M. O'Connor, Clerk, Millstreet, Ireland	,, 13
Lofthouse Gate—Board Schools	U.D. School Board	William Watson, Architect, Wakefield	,, 13
Barrow-in-Furness—Shop and Three Dwelling-Houses, Greengate-street	Co-operative Society, Limited	John Y. McIntosh, Architect, 6, Cornwallis-street, Barrow	,, 14
Leeds—Branch Office, Hunslet-road	Yorkshire Banking Company	Bedford and Kitson, Architects, Greek-street Chambers, Leeds	,, 14
Otterbourne—Villa and Stables		J. Bucksey, Hecton Farm, Otterbourne	,, 14
Chequerbent—County Police Station	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	,, 15
Halam—Four Cottages	George Tinley	Sheppard and Harrison, Architects, 17, Kirkgate, Newark	,, 15
Clara Vale—Seven Houses	Stella Coal Co.	The Colliery Office, Clara Vale, Ryton-on-Tyne	,, 15
Drumsurn—R.C. Church	Rev. E. Loughrey, P.P.	Daniel Conroy, Architect, 2, Bishop-street, Londonderry	,, 15
Admaston—Caretaker's Cottage at Sewerage Work	Urban District Council	Myles Morley, Surveyor, 45, Walker-street, Wellington, Salop	,, 15
Helligan—Repairs and Additions to Farmhouse	H. H. Hooper	T. H. Andrew, Architect, 1, Trevarrick Villas, St. Austell	,, 15
Canterbury—Foundation Works, &c., at Electricity Works, Northgate-street	Lighting Committee	Henry Fielding, Town Clerk, 15, Burgate-street, Canterbury	,, 17
Beckenham—Electric Light Station	Urban District Council	John A. Angell, Engineer, Beckenham	,, 17
Cymmau—Alterations at C.M. Chapel		William Lewis, Cymmau	,, 17
Wimbledon—Public Baths, Latimer-road	Urban District Council	R J. Thomson, A.R.I.B.A., 47, Hill-road, Wimbledon	,, 17
Leeds—Alteration to Shop and Office, Lands-lane	Charles Appleton	Thomas Winn, Architect, 92, Albion-street, Leeds	,, 17
Barnoldswick—Isolation Hospital	Urban District Council	W. Bennett, Surveyor, Council Offices, Barnoldswick	,, 17
Pellon—Foundry		T. H. Tyson, Architect, Fountain-street, Halifax	,, 17

BUILDINGS—*continued.*

Stamford—Workhouse	Guardians	J. H. Morton, F.R.I.B.A., Architect, 50, King-st., South Shields	July 17
Old Hill—Extension of Offices	Rowley Regis U.D.C.	Meredith and Pritchard, Architects, Bank Buildings, Kidderminster	,, 17
Warrington—Electric Light Station and Central Sanitary Depot at Wharf Meadows	Electric Lighting Committee	James Deas, C.E., M.I.M.E., Municipal Offices, Warrington	,, 18
Wargrave—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 18
Dover—Additions to Car-Shed	Town Council	Henry E. Stilgoe, Borough Engineer, Town Hall, Dover	,, 18
Newstead, Halifax—Nineteen Houses		T. H. Tyson, Architect, Fountain-street, Halifax	,, 18
Dorchester—Alterations and Additions to Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 18
Lowestoft—Electric Light Station	Corporation	A. E. Pridmore, Architect, 2, Broad-street Buildings, E.C.	,, 18
Dewsbury—Twenty-Seven Houses, Salter-square Estate	Pioneers' Indus. Soc.	Holtom and Fox, Architects, Westgate, Dewsbury	,, 18
Westbury—Stable at Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 18
Walsall—Depot, Wolverhampton-street	Corporation	John R. Cooper, Town Clerk, Walsall	,, 19
Irchester—Additions to Wesleyan Chapel and School		N. H. Boney, Architect, 124, Chancery-lane, London, W.C.	,, 20
Folkestone—New Wing to Victoria Hospital	Committee	H. Percy Adams, F.R.I.B.A., 28, Woburn-pl., Russell-square, W.C.	,, 20
Earlsheaton—Infectious Diseases Hospital	Dewsbury Joint Hospital Board	Holtom and Fox, Architects, Westgate, Dewsbury	,, 20
Carlisle—Enlargement of Head Post Office	Commissioners of H.M. Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	,, 21
Dartford—Technical Schools	Urban District Council	G. H. Tait, M.I.C.E., Architect, Lowfield-street, Dartford	,, 24
Whitechapel, E.—Enlargement of Fire Station	London County Council	The Architect's Department, County Hall, Spring Gardens, S.W.	,, 25
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	,, 26
Brighton—Alterations and Additions to Public Library, Museum, and Art Gallery		Francis J. C. May, M.I.C.E., Boro' Engineer, Town Hall, Brighton	,, 27
Kingston-on-Thames—Alterations to Old Workhouse Buildings	Guardians	William H. Hope, Archt., Union Offices, Portsmouth-rd., Kingston	,, 31
Hereford—Extension of Roofing at Station	Joint Committee	A. E. Bolter, Sec. to Joint Committee, Paddington Station, London	Aug. 1
Southend-on-Sea—Technical Schools and Fire Brigade Station	Corporation	Wm. H. Snow, Town Clerk, Southend-on-Sea	,, 21
Malmo—Electricity Works		The Gasworks Directors, Malmo, Sweden	Sept. 1
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	,, 12
Abertillery—Rebuilding the Bell Inn	Phillips and Sons	Swalwell and Creighton, Archts, Steam Packet Chambers, Newport	—
York—Six Cottages, Huntingdon-road		The Brickworks, Stockton-lane, York	—
Stanton—Nine Pairs of Small Houses	South Derbyshire Land Company	Henry Beck, Architect, 30, High-street, Burton-on-Trent	—
Keighley—Additions to Vulcan Works, Strawberry-street		John Judson and Moore, Architects, York Chambers, Keighley	—
Tadcaster—Two Houses and Shops, and Four Cottages		A. D. Kaye, Architect, 71, Albion-street, Leeds	—
Ballygran—Presbytery	Rev. P. Hurley	J. Carroll, Architect, at Killacolla, Ballygran, Charville	—
Kingston—Two Shops in London-road		J. Spratt, Architect, 90, Queen-street, Cheapside, E.C.	—
Sledmere—Additions to Vicarage		Brodrick, Lowther, and Walker, Architects, Hull	—
Bakewell—Retort-House at Gasworks	Urban District Council	Vernon R. Cockerton, Clerk, Bakewell	—
Kettleshulme—Wesleyan Chapel and School		C. W. Johnson, Architect, Whaley Bridge	—
Abergavenny—Alterations, &c., Market Tavern		B. J. Francis, Architect, Abergavenny	—
Ladmanlow—Primitive Methodist Schoolroom	Trustees	Garlick and Flint, Architects, 5, Terrace-road, Buxton	—
Abergavenny—Alterations, &c., Crown and Sceptre, Mardy		B. J. Francis, Architect, Abergavenny	—
Kinghorn—Four-story Tenements, High-street		Swanston and Leggie, Architects, Kirkcaldy and Burntisland	—
Garforth—Educational Buildings	E. & W. Ridings Jnt. Agrcul. Council	Smith and Tweedale, FF.R.I.B.A., Archts., 12, South-parade, Leeds	—
Leeds—Clothing Factory		J. M. Fawcett and Sons, Architects, Basinghall Chambers, Leeds	—
Hereford—Business Premises	Greenlands, Limited	W. W. Robinson, Architect, 10, King-street, Hereford	—
Ashton-under-Lyne—Detached Villa		T. D. Lindley, Architect, Market Avenue, Ashton-under-Lyne	—
Sheffield—Cellaring at Old Albion Brewery	Directors	Hall and Fenton, Architects, 14, St. James's-row, Sheffield	—
Moneymore—Restoration of Manor House		Henry Byrne, Moneymore, Ireland	—
Loughborough—Alterations to Blue Boar Inn	Highway Committee	Albert H. Walker, A.M.I.C.E., Borough Engineer, Loughborough	—
Woodberry, N.—Chapel and Schools, St. John's-road		Hickton and Farmer, Architects, Walsall	—
Griffithstown—Two Houses and Premises, Windsor-street	F. E. Jenkins	B. J. Francis, Architect, Abergavenny	—
Long Eaton—Wesleyan Schools, Cross-street		E. R. Ridgway, Architect, Long Eaton	—
Ipswich—Manual Instruction Centre in Smart-street	School Board	Eade and Johns, Architects, Thoroughfare, Ipswich	—
Great Ayton—Four Houses		T. and A. Harbottle, Albion House, Great Ayton	—
Alnmouth—Additions to Clubhouse	Alnmouth Golf Club	Forster and Paynter, Fenkle-street, Alnwick	—
Milnrow—Villa at Newhey-road		S. Butterworth and Duncan, Architects, Rochdale	—
Bradford—Enlargement Wesleyan Mission Hall, Sunbridge-rd.		Walker and Collinson, Architects, Swan Arcade, Bradford	—
Ipswich—Alterations to Argyle-street School	School Board	E. F. Bisshopp, Architect, Museum-street, Ipswich	—
Cork—Rebuilding Premises in Patrick-street		Arthur Hill, B.E., F.R.I.B.A., 22, George-street, Cork	—
Middlesbrough—Pulling Down Kilns, &c.		The Normanby Brick Company, Limited, near Middlesbrough	—
Batley Carr—Twenty-seven Houses, Salter-square Estate	Dewsbury Pioneers' Indust. Society	Holtom and Fox, Architects, Westgate, Dewsbury	—
Long Eaton—Factory		E. R. Ridgway, Architect, Long Eaton	—
Hampton-in-Arden—Restoration of Barstow Church		E. H. Lingen Barker, Architect, 146, St. Owen-street, Hereford	—
Rawtenstall—Alterations to 66, Bank-street	R. H. Whittaker	Thomas Bell, Architect, 14, Grimshawe-street, Burnley	—
Leeds—Three Houses, Harehills-lane		J. W. Watson, 21, New Station-street, Leeds	—
Coppull—Classroom, Moor School		Heaton and Ralph, Architects, King-street, Wigan	—
Nottingham—Improvements at People's College Schools	School Board	Evans and Sons, Architects, Wheeler Gate, Nottingham	—
Birtle—Residence, with Stabling, &c.		D. Hardman, Architect, Siver-street, Bury, Lancs.	—
Wigan—Five Houses and Shop		T. Worthington, Auctioneer, 2, Victoria Buildings, King-st., Wigan	—
Manston—Four Houses in Sand Bed-lane	John Inchbold	G. W. Atkinson, Architect, 1, Mark-lane, Leeds	—
Girlington—Four Through Houses, Letton-road		R. Drake, Architect, 142, Allerton-road, Bradford	—
Wretton—Restoration of Church Tower		A. J. Lacey, Architect, 6, Upper King-street, Norwich	—
Long Eaton—Factory Chimney (140ft. high) and Boiler House	Bemrose and Sons, Ltd., Derby	E. R. Ridgway, Architect, Long Eaton	—
Barrow-in-Furness—Houses and Shops, Crelin-street		James Smith, 43, Windsor-street, Barrow-in-Furness	—
Ossett—Enlargement of First Baptist School		F. W. Ridgway, F.R.I.B.A., Dewsbury	—
Starbeck—Stores	Harrogate Co-operative Society	Arthur A. Gibson, Architect, 8, Cambridge-crescent, Harrogate	—
Nottingham—Shops, &c., Parliament-street		Heazell and Son, Architects, Bank Chambers, Nottingham	—
Barston—Restoration of Church		E. H. Lingen Barker, Architect, 146, St. Owen-street, Hereford	—
Shaw—Two Semi-Detached Villas	A. and A. Crompton	J. Rawlinson, Goats, Shaw	—
Harrogate—Lodge at Larchfield		H. R. Cousins, Leadhall-lane, Harrogate	—
Bedminster—Tannery Buildings		Herbert J. Jones, M.S.A., Architect, 12, Bridge-street, Bristol	—
South Moor—Fourteen Houses	A. Swinburn	Wm. Forster, Architect, Clifford-road, Stanley, R.S.O.	—
Crewkerne—Factory		H. Hall, Architect, 19, Doughty-street, Mecklenburgh-square, W.C.	—
Bradford—House and Shop, Carlisle-road		W. B. Wood, Architect, Mann's-court, Kirkgate	—
Dowlais—Offices	Iron Co.	E. A. Johnson, F.R.I.B.A., Architect, Abergavenny	—
Stanley—Reseating & Renovating Primitive Methodist Chapel		Wm. Forster, Architect, Clifford-road, Stanley, R.S.O.	—
Alfreton—Four Villas		Ernest Oxley, M.S.A., Architect, Melbourne Lodge, Clay Cross	—
Heyton—Additions to Stone House	R. O. Lamb	Castiglione and Gibbings, Surveyors, 31, Lowther-street, Carlisle	—
Mastin Moor—Additions to Gate Inn		W. H. Wagstaff, Architect, 57, Saltergate, Chesterfield	—
Berwick—School, Cross Green		A. B. and W. Scott Deakin, Architects, 12A, Pride Hill, Shrewsbury	

ENGINEERING.

Kingstown—Waterworks	Main Drainage Board	Kaye Parry and Ross, Civil Engineers, 62, Dawson-street, Dublin	July 8
Longridge—Sludge-pressing Plant	Urban District Council	Thos. S. McCallum, A.M.I.C.E., 52, Corporation-street, Manchester	,, 8
Kingstown—Repairing Pumping Machinery	Main Drainage Board	Kaye Parry and Ross, Civil Engineers, 63, Dawson-street, Dublin	,, 8
Chertsey—Steam Road-Roller (10-ton)	Urban District Council	J. Freebairn Stow, Engineer, Chertsey	,, 10
Settle—Double-lift Gas-holder	Settle Gas Co.	John Waugh, Sunbridge Chambers, Bradford	,, 10
Naples—Harbour and Docks (estimated cost £162,400)		The Public Works Department, Rome	,, 10
Carlisle—Storage Tank at Head's Nook	Rural District Council	George Armstrong, Architect, 24, Bank-street, Carlisle	,, 10
Grimsby—Boilers, Engines, Dynamos, Pumps, &c.	Corporation	Marshall Petree, A.M.I.C.E., Town Hall, Grimsby	,, 10
Blaenavon—Heating Apparatus at Garn Board School	School Board	Harry Parry, Clerk, Blaenavon	,, 10
Tynemouth—Covered Service Reservoir	Corporation	James Mansergh, Engineer, 5, Victoria-street, Westminster	,, 10
Copenhagen—Ironwork for Two Viaducts (300 tons)	Danish Ministry of the Interior	Oberingenieur Staatsbahnanlagen, Reventlovsgade 10, Copenhagen V.	,, 10
Swansea—Covered Service Reservoir (500,000 gallons)	Corporation	R. H. Wyrill, Engineer, Guildhall, Swansea	,, 10
Halifax—Excavation of Pipe Trench	Waterworks Committee	James A. Paskin, C.E., Waterworks Engineer, Town Hall, Halifax	,, 10
Newbridge—Bridge Repair	Magor Rural District Council	S. B. Jones, Surveyor, Talgarth, Llanvaches, Magor, Mon.	,, 10
Battersea, S.W.—Centrifugal Pump at Heathwall Pumping Station, Nine Elms-lane	London County Council	The Engineer's Department, County Hall, Spring-gardens, S.W.	,, 11
Southport—Refuse Destructor	Corporation	R. P. Hirst, Borough Engineer, Town Hall, Southport	,, 11
Isleworth—Iron Escape Staircases at Schools	Brentford Union Guardians	W. H. Ward, Architect, Birmingham	,, 11
Southampton—Electric Lighting Plant	Corporation	Kincaid, Waller, and Manville, Engrs., Gt. George-st., Westminster	,, 11
Halifax—Tanks, &c., Salterhebble	Highways Committee	E. R. S. Escott, C.E., Borough Engineer, Town Hall, Halifax	,, 12
Shotts—Cutting Tracks	Lanarkshire District Committee	J. and A. Leslie and Reid, C.E., 72A, George-street, Edinburgh	,, 12
Athy—Vertical Boiler (5H.P.)	Guardians	J. Hurley, Engineer, Board Room, Workhouse, Athy	,, 12
Halifax—Tanks, &c.	Highways Committee	Edward R. S. Escott, C.E., Borough Engineer, Town Hall, Halifax	,, 12
Cardiff—Reconstructing Tramway (4½ miles)	Provincial Tramways Co.	John Glenn, 11, Queen Victoria-street, E.C.	,, 12
East Ardsley—Puddling and Concreting Gasholder Tank	Gaslight Company	Walter Lister, Secretary and Manager, East Ardsley, Yorks	,, 12
Halifax—Relief Gasholder	Corporation	Thos. Holgate, Gas Engineer, Halifax	,, 12
Castle Eden—Widening Eden Vale Bridge	Durham County Council	William Crozier, A.M.I.C.E., County Architect, Durham	,, 13
Plymouth—Pumping Machinery	Corporation	James Mansergh, 5, Victoria-street, Westminster	,, 13
Southwold—Cliff Protection Works	Corporation	F. Ball, Town Hall, Southwold	,, 13
Harmby—Water Supply Works	Leyburn Rural District Council	Rodwell and Son, Engineers, West Witton, Leyburn, R.S.O.	,, 13
Barnstaple—Masonry Work for Swing-Bridge over River Yeo near Braunton-road		James Bossom, Town Clerk, Municipal Buildings, Barnstaple	,, 14
Pembroke, Co. Dublin—Plant for Municipal Electricity Works.	Urban District Council	R. Hammond, Consulting Engnr, 64, Victoria-st., Westminster, S.W.	,, 14
Brighton—Concrete Groins and Sea-Walling, Madeira-road	Town Council	Francis J. C. May, Borough Engineer, Town Hall, Brighton	,, 14
Rathmines—Plant for Municipal Electricity Works	Urban District Council	R. Hammond, Consulting Engnr, 64, Victoria-st., Westminster, S.W.	,, 14

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THE REAL AND ARTIFICIAL.

HONEST and practical architecture, the outcome of simple and direct modes of expressing the wants of our time, is in much danger just now of being neglected for the disingenuous and meretricious. The average designer is intent upon dealing in "properties," in recording the historical, the archæological, the ideas and sentiments of certain ages. Like the schoolboy, he translates, but hardly ever knows what he is translating. One able writer has said: "The man uses languages as the vehicle of things, and the boy of abstractions," and this expresses very fairly the difference between the practical designer who knows what he is about, and the crib who wishes to produce an effect. The real artist represents the first. He understands his art to be the vehicle of actual requirements, of materials and facts of construction, and he so uses it as to express his wants as directly as possible. There is an unaffected simplicity in all he does, which to the popular mind may be looked upon as a meagreness or poverty of thought; but every now and again he surprises us by one or two little *coups de grâce* in the shape or a turret, or a doorhead, or a window which enhances the plainness of the wall surfaces. These set off as a foil the real thought and invention of the artist, and give piquancy and freshness to all he does. At first glance the design may not look much; but by degrees it reveal itself to the mind; piece by piece one sees how well the plan has been studied, or the meaning of the design brought out.

The two ideals of art—Gothic and Renaissance, illustrate somewhat the distinction between the real and the imitational. The old Gothic builder was but a superior workman who lived on the scaffolding — the later Renaissance architect the cultured artist steeped in the ancient traditions of his art who had not lost the craftsman's honesty. Such were the architects who built the Louvre and the Tuileries. They spent much time in Italy and the home of letters; but the Gothic builder, practical and rough as he was, represents the builder who uses his art-craft as the vehicle of fact, who converts his materials to the best advantage, and imparts to them just that meaning and grace which makes honest art of all he touches. The modern professional architect of to-day has very little of his spirit. He represents the architects of the Renaissance, but without that continuity of thought and feeling which gave the impulse to the men of the age of Louis II. or François I., who designed the Chateau of Blois or the Palais de Justice, Rouen. These typical buildings very adequately represent the genius of the Early Renaissance, where we perceive the connecting links between Gothic and Renaissance, uniting, as they do, the spirits and genius of both. The first is really a Gothic building, its hall is essentially Gothic, while the beautiful north wing of Francis I. is of the richest Renaissance. Other parts faintly indicate the transition. Even in the ornament, as the *fleur-de-lis* and ermines' tails which adorn the arcade, we see the Gothic blending with Renaissance panels, and flattened arches of the period. So, too, the Gothic details of lofty dormers, high-pitched roofs, pinnacled balustrades, and gargoyles of the Palace at Rouen are blended with features of Classical origin. But these buildings do not represent the modern imitational design of to-day any more than their architects do. There was still a vernacular spirit about work which is now lost, an attempt to continue the traditions and work of the old builders. We have no longer this reality. The few men who are in the advanced ranks are endeavouring to be real and honest in their work, are engaged in a deadly struggle against the blighting influence of Academicism or the empty forms of mere style.

When we look more closely into the buildings of these two schools—those of men who endeavour to make their art the "vehicle of things," and those who use other ideas and abstractions in which to clothe their requirements—we shall find much to instruct. One works under real conditions—the necessities of plan, the absolute demands of accommodation and administration, honest construction, the limitations of materials; and the other class work under the artificial conditions imposed by style and precedent, or merely arbitrary caprice. To take a few examples. We notice plans for municipal buildings or public offices in which everything has been sacrificed to a big central hall or imposing staircase—very little to the actual convenience or the convenient location of departments and offices. The plan has been evidently taken from another building. It may be ideal, but is quite impracticable as a working plan. Bad and inadequate lighting, windows placed for elevation and not for actual use, are common mistakes in plans of this class. In a commercial building designed for the carrying out of a particular trade, the exigencies of the business have been studied only so far that the building follows another of a similar class; no attempt has been made to work *de novo* from the beginning, or to make the design embody the business requirements. In the construction, iron pillars and girders are employed as they always have been, the same patterns and details are used that were employed for a totally different set of conditions; whereas a real artist in metal might have made an absolutely new departure. The woodwork and decoration follow the same lines; they are elaborate with broken pediments, fanciful turned finials and balusters—the ornamental "abstractions" or "properties" of the decorator, and it never occurs that such decoration is absolutely useless and redundant, and that the designer could have done better if he had discarded everything that was superfluous, and had made his seats and their backs, the dadoes of his rooms, and partitions of wood as simply as his judgment dictated, leaving the decoration to the moulded parts, and to the carving of the flat surfaces of panels. The language of artifice is used in a variety of forms. No overmantel, or cabinet, or bookcase is now made without its broken or rococo pediment stuck in the top; pilasters, turned and twisted pillars abound in the so-called "art furniture" of the day. These devices, like so many tropes or hyperboles of rhetoric, exaggerate or misrepresent the structure to which they are affixed. The modern restaurant is replete with decorative devices of the most redundant kind, and we look in vain for a piece of quiet or reposeful design which truly represents what it really is. We hear a good deal about "motives" of design which often means nothing more than some fanciful idea of the artist; it would be truer to lay down the dictum "Never design without you know what you want"—in other words, "Design with an intention," or some purpose in view.

The elevations of our new buildings are painful examples of a neglect of this rule. Look at the modern "Renaissance" of any of our streets. What a farrago of meaningless forms and details!—what a "piling up of agony" in the shape of dormer and ornamental gable, of finials and cupolas, such as we see in new buildings at the West-end, at the Elephant and Castle, and most of our suburbs. There is plenty of it in our leading thoroughfares of the Strand, Oxford-street, &c. The redundance of curved and broken gables, entablatures, pilasters, carved panels—in fact, all the accessories of the style is in proportion to the want of intention. Where do we find the art which is really the "vehicle of things"; the well-thought-out elevation which is not afraid to accentuate the construction within, whether of iron or brick; which is not afraid of allowing a shop to appear as one, or a set of offices or residences to honestly express their meaning, or a theatre façade to show itself as a plain shell with spacious entrances in it instead of a miniature palace? Why should we be afraid of a few square feet of brick wall or glass and iron? Why couceal every building by façades which represent dwellings or palaces?

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THE ARTS AND CRAFTS SCHOOL.

THE efforts of the Technical Education Board to provide well-directed instruction for students and craftsmen engaged in the more artistic trades, are well rewarded by the exhibition of work now on view at the Central School of Arts and Crafts, 316, Regent-street. To encourage the art craftsman to devote his attention to the chief aim of art—the "application of skill, experience, and good taste" to actual work this school has been established. The conditions under which the students have to work are made as general as possible, the candidates are left free to select their own subjects, and to do their best work in their own way, and in these points the Technical Education Board are trying in some degree to correct or counteract the artificial conventional art teachings of many of our schools, where the conditions impose adherence to models.

In all the exhibits we find a healthful freedom from conventional restraint; the designs submitted for architectural work are drawn often roughly, and without the slightest attempt at mere draughtsmanship, but simply to exhibit the intention of the student; there are no specimens of mere penmanship, shading, elaborate drawing, and the like which we find in many designs in our schools of art. What is done has the workshop stamp upon it. Let us take, for example, the few designs submitted for simple, unpretentious building, as the design for a small cottage in brick with ornamental cut gable. The plan has been carefully thought out with its grouping of sitting-room, kitchen, and scullery round a centre lobby, which forms an ┐-shaped block. There is no attempt at ornament or detail except the shaped or cut brick gable. A design for a cottage, by S. Caulfield, in brick, and rough-cast in the upper story, is exceedingly simple and broadly treated, the student showing, to a large working scale, the details of roof and eaves. A design for a bay window, by another student, "A. E. B.," is very quiet and plain; it shows a simple three-sided bay, 3ft. wide, carried up two stories with flat roof in a plain tile-hung gable, 18ft. wide; but the student has shown to a good scale the connection of woodwork of bay with the brick opening, the mode of forming sill and casement; the leaded lights, and the way the tile-hanging is tilted over the lower story. It is just such a drawing as an architect may put into the hands of the tile-hanger and joiner. Another more ambitious design is for a country house, in local stone, with mullioned windows; the plan is the most noticeable part. At the angles of house proper are diagonal wings; two of these contain the billiard-room and picture gallery, while the right-hand wings form a diagonal square with open court in centre, and comprise the kitchen offices. The details are poor. This department of design is ably presided over by Mr. Halsey Ricardo.

The designs for ornamental lead-work or lead-lights show a few well conceived sketches for rectangular-shaped casements, in which the centre lights have a decorative folial design of good motive. Much variety and decorative charm may be given to plain mullioned lights by arranging the lead "cames" in simple leaf or conventional forms, and the students' work shows a right conception of the leaded light. In another part we see a few actually made lead examples of craftsmanship, one or two lead rain-water heads of bold design, embossed on the front and sides in a manner that does not offend the sense of fitness of motive or of suitability to the material. We can congratulate Mr. F. W. Troup, the director of this department, on the results of his teaching. Turning again to the designs, we notice a few clever sketches for a bishop's staff by A. G. Child, bold and original in treatment. The sketches or studies for furniture are few and not well represented; a china cupboard and bookcase, a dressing cabinet and dressing table comprise the chief designs. The drawings of natural plants are preliminary studies, and are suggestive in some cases, and several chalk drawings of Classical figures from the cast are exhibited. But the main attractions of the exhibition are the objects of craftsmanship. The stonework exhibits show that the right principles of design in stone are inculcated by the director, R. H. Hook. The jamb moulding and carved work are creditable specimens of the work done. The modelled designs in plaster—a very important branch of study—shows one or two good works. The modelled low-relief "Truth" in plaster has a well-conceived motive; and there are a design also for a finger-plate, a bishop's staff, and door-knockers.

Several very nice specimens of stained-glass painting under Mr. Christopher's Whall's direction are on view, and the case of metal-work *repoussé*, &c., contains several specimens of workmanship of good design. One is a well-conceived finger-plate, in which the beaten-up design is confined to a few curved and graceful lines. There is a *verve* in the work which places it a long way above casting or machine-stamped work. The cases of bookbindings contain several interesting specimens, especially examples by J. Corcoran, E. W. Pillfold, R. Ripp, A. Molyneux, &c., and the specimens exhibited of woodcuts in colour show some broad effects of design and colour Japanese in motive. In the wood-carving and gilding we notice some very excellent designs for picture frames, of simple incised ornament on flat surfaces, well adapted for wood, as applied to this purpose.

Every kind of study is encouraged; the studies from nature and art works are intended to be initiative and preliminary; the object of the school is to bring out the student's or craftsman's artistic ideas, either in the form of rough sketches or designs and cartoons, or as real objects designed and executed by the candidate himself. The workshop influence is kept in view, or is the the chief incentive. Our art students and apprentices to the building trades should avail themselves of the advantages offered by this school, which is mainly restricted to those engaged in the trades, these being presided over by a staff of specialists, who work under the direction of Mr. G. Frampton, A.R.A., and Mr. W. R. Lethaby.

The young craftsman and student will find his workshop experience greatly aided by the training given here. It is some proof of the success of the scheme that during the last session there has been an acquisition in the number of candidates, and a distinct improvement in the quality of the work done during the year. A large number of the awards offered by the Technical Education Board, and open to all art schools in London, were made to students of this school. The ordinary amateur elements of art, such as drawing and painting, are provided for elsewhere. The Central School is intended to complete the education of the craftsman in his own craft by showing him how to develop his artistic instincts to the best advantage. The existing workshop system leaves the apprentice few opportunities for this, and he is generally confined to a narrow groove of work, injurious to his prospects.

UNIVERSITY COLLEGE, LONDON.

THE prize list at University College, London, for the session just ended, in the Department of Architecture, which has so long been under the skilful guidance and tuition of Professor T. Roger Smith, F.R.I.B.A., is as follows:—Fine Art: Donaldson Silver Medal, C. J. Strachan; second prize, A. C. Wallingford. Second Class, G. O. Howship. Third Class, L. R. Cargill, T. J. Tatham. Construction: Donaldson Silver Medal, R. H. J. Mayhew; second prize, C. J. Strachan; certificate, B. F. Hartnoll. Third Class, W. C. Bramham, S. T. Clarke. Classes maintained by the Carpenters' Company—Architectural Drawing Class: prize, A. A. Lermit. Constructional Drawing Class: first prize, R. E. Elwes; second prize, J. H. Davies; third prize, W. C. Symes. Second Class, J. F. Ashby, W. C. Bramham, H. Ridout, G. H. A. Wade. Quantity Surveying: Advanced Class, prize, T. A. Burr. Second Class, T. H. Smith, F. C. W. Stacey. Third Class, S. Cansley, F. A. King. Elementary Class: first prize, E. D. Ford; second prize, G. Waghorn. Second Class, A. G. Carter, W. M. Epps, R. L. Roberts. Third Class, L. Benjamin, W. J. Holt, W. A. S. Pettit, R. M. Wallace.

THE VAN KANNELL REVOLVING DOOR.

WE have recently had the opportunity of inspecting a new revolving door which is peculiarly adapted for hotels, offices, and other large buildings, and which we understand has for many years been in successful operation in the United States and Canada. The Van Kannell revolving door is in reality four separate doors which radiate at right angles from a central pivot. The action is noiseless, and the four wings being balanced, no matter where they happen to stop, two of them will always be in contact with the curved walls, rendering the door absolutely wind and weather proof. The wings can be pulled together and pushed aside, thus leaving a clear and full open passage for ventilation or the carriage of bulky furniture. The new door has been successfully installed in the main entrance of the Midland Grand Hotel, St. Pancras, the Queen's Hotel at Leeds, and the recently opened Carlton Hotel, Pall Mall, and there is no doubt that it will soon become a familiar feature in all public buildings.

FIREPROOF SHUTTERS.

A NEW system of fireproof shutters is being introduced in New York on the new Singer Building, Liberty-street. The two interior walls face a corner, each having three bow windows close together, and thirteen stories high. The shutters are made of steel of the rolling type, consisting of slats or steel laths, 2in. wide, fitted together by bending the edges of the slats so that they interlap. The shutters roll on a 3in. barrel. The slats are put together by sliding one into the other, end-on. The barrel is mounted on a shaft which turns in two brackets secured to the building, and contains strong steel springs to counterbalance the weight of shutter. The shutters run in steel girders, and have a polishing board over them. The details of this shutter are illustrated in the *Engineering Record*. It is stated the shutters are grouped in threes by joining the winding shafts of the barrels, universal joints being employed at the angles of the bay windows. This continuous line of shafting is driven by vertical shafts between each window, fixed to the piers. All the shutters from the first to the sixth floor are opened or closed at the same time in four sections, and from the seventh to the thirteenth flour in four sections on both sides of the building. The system has been patented by Mr. W. H. Brodie, of Messrs. W. H. Brodie and Co. The slatted shutter not only permits of using heavy metal, but is said to roll up in about one third less space than the old corrugated shutter. The shafting and gearing appear to be simple in arrangement, the vertical shaft being connected to the jock shaft by a worm gear. One man can raise or lower 18 or 21 shutters, the weight being balanced by the spring. By a simple arrangement, by throwing out of connection one of the tiers, one out of every three tiers of shutters may be raised from the outside by firemen in case of fire, thus complying with the Fire Department rules.

CHIPS.

The Bristol branch offices of the Prudential Assurance Company at the corner of Clare-street and St. Stephen's-avenue are being rebuilt from plans by Messrs. Alfred Waterhouse and Son, in red Aberdeen granite, brickwork, and terracotta. Messrs. Cowlin and Son, of Bristol, are the builders, and Mr. W. Brock is the clerk of works.

The British Museum Print Room has received the gift of a hundred etchings by Colonel Robert Goff, including examples of landscape, architectural, and marine subjects.

The offer of Mr. Pierpoint Morgan to light the interior of St. Paul's Cathedral with electricity has been accepted, and experiments in lighting the building have been made. These have proved most satisfactory, and arrangements are in progress to equip the Cathedral with a complete installation of electricity. It is estimated that the cost of the work will be £5,000.

Mr. J. Passmore Edwards was admitted to the honorary freedom of the Stationers' Company on Friday, in recognition of his generosity in establishing the Caxton Convalescent Home for the Printing and Allied Trades, his donation to the Printers' Pension, Almshouse, and Orphan Asylum Corporation, and his munificent gifts in connection with the establishment of Free Libraries in London and the suburbs. In the evening, Mr. Edwards was the chief guest at a Livery dinner of the Company at Stationers' Hall.

Two important changes in building by-laws came into operation in Ipswich a few days since. One provides for an increased thickness of party-walls, and the other for the testing by smoke or water under the drainage inspector's direction of every new house-drain.

In the June number of *Stone*, an illustrated magazine, published in New York, four pages are devoted to a biographical sketch of Mr. Harry Hems, and a description of the artist's works, while there are also given three illustrations, representing the studios at Exeter, the subject of the notice at work therein, and a representation of the recumbent statue of Canon Smith in West Stafford Church.

At the Penge Police-court, on Tuesday, Mr. Collman, solicitor to the London County Council, was granted four summonses against the Crystal Palace Company for erecting buildings near the polo ground in the Palace, belonging to the Company, without first obtaining the Council's permission under the London Building Act. He said the Palace Company claimed an exemption under their special Act of Parliament, and that point would have to be decided when the case came before the Court.

The first section of the Medd Memorial Church schools at Amble was opened by the Bishop of Newcastle on Tuesday. The buildings are on the classroom principle, with central corridor 7ft. wide. The heating is by hot-water apparatus, while the ventilation will be by means of exhaust shafts, assisted by Boyle's ventilators. The contract has been carried out by Messrs. R. Carse and Son, builders, Amble, in accordance with plans and specifications designed and supplied by Mr. Jas. Wightman Douglas, Spring Gardens, Alnwick.

The Aston Union Cottage Homes, near Birmingham, are being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A new lectern was recently dedicated in the Lady-chapel at Salisbury Cathedral. The lectern stands on an octagonal platform, and consists of a central octagonal shaft, with columns against four sides and rising out of a moulded base. The top of the shaft breaks out into four carved and traceried canopies, under which, on brackets, stand figures of the Four Evangelists. Above the canopies is much moulded and carved work, forming an octagonal cap, on which the gabled book-rest stands and revolves. The ends of the book-rest have pierced carved spandrels, between which are fixed candle sconces of hammered iron. The work is of Burmese teak, and has been executed from the designs and under the superintendence of Mr. S. Gambier Parry.

OBITUARY.

THE death is announced of Mr. GRIDLEY J. F. BRYANT, of Boston, Mass. Mr. Bryant was, says the *American Architect*, for many years the most noted architect in Boston; he built, in his time, nearly all the principal public buildings, and hundreds of private ones. He was for several years, in the latter part of his life, superintendent of the Government Building in Boston, at a good salary; he was skilful, energetic, and honest to a remarkable degree, and his family expenses were by no means unreasonable; yet he died very poor, so poor, in fact, that he had been dependent for some years on the charity which his friends were glad to be able to offer him. To Mr. Bryant had been confided the expenditure of many millions of dollars, and he could have pocketed a fortune every year at the expense of those who trusted him, if he had been willing to swerve a hair's-breadth from the standard of integrity which he had determined to follow. His works include the Boston City Hall, in the design of which he was associated with the late Arthur Gilman, the Charles-street Gaol. Mr. Bryant is said to have been the first to introduce into Boston the granite fronts which soon became the most noted peculiarity of the city, and which, in their turn, since the great fire of 1872 showed their imperfections, have gone completely out of use. His father, Grindley Bryant, the President of the Granite Railway Company, under whose care the second railroad in America was built, for conveying stone from the Quincy quarries to the Neponset River, naturally advocated the use of granite for building, and the son was quick to find methods of utilising the ideas suggested to him.

PROFESSIONAL AND TRADE SOCIETIES.

SOMERSET ARCHÆOLOGICAL SOCIETY. — The members, to the number of 50, of the Axbridge branch (principally from Weston-super-Mare) of this society had an excursion to the Sedgemoor churches last week. The party proceeded in brakes from Bridgwater to Chedzoy, where the church dedicated to St. Mary was inspected, Lieut.-Col. Bramble explaining the chief points of interest. The many curiously-carved quaint oak bench ends were pointed out, whilst the finely-worked altar frontals, made from an ancient cope discovered under the pulpit during the restoration of the church, and a 15th-century brass were admired. On a buttress on the south side of the church is a sandstone, on which scythes were sharpened by the rebels previous to the battle of Sedgemoor. The tower is a fine one, and there are also several dedication crosses in good condition. The company then drove past the site of the battle of Sedgemoor to the church of St. Mary, Western Zoyland, where Colonel Bramble pointed out there was the typical Somerset waggon roof and the compass roof side by side. The carved oak benches and the beautiful tower which this church possesses were also explained. It was in this church that hundreds of the rebels were imprisoned after the Sedgemoor fight, and the curious charges for food, &c., for the use of those confined are set forth in an ancient book belonging to the church. Another couple of miles drive brought the archæologists to the Church of the Holy Cross, Middlezoy, which is an interesting edifice. It has an oak Jacobean pulpit of 1606, a carved oak wood screen (early 14th-century work), a font of the same date, and a hagioscope. The tracery in the chancel window is said to be the finest of any church in Somerset.

A very large building, composed principally of iron, wood, and glass, is to be erected at Exmouth for horticultural purposes. The structure will be over a quarter of a mile in length, and of an ornamental character, with dome in centre, nearly 80ft. high, with towers at intervals about 45ft. high. The width of the building in the centre will be 44ft., and at the narrowest part 26ft., and it will be heated with hot water. Mr. Ernest E. Ellis, of Market-street, Exmouth, is the architect.

The foundation-stone of a new Welsh Calvinistic Methodist Chapel was laid in Crwys-road, Cardiff, on Wednesday week. The building will seat 650 persons, and is described by the local press as "a revolutionary departure in chapel architecture," and as "a spasm of ornate Dissent." The architect is Mr. J. H. Phillips, of Cardiff.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

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RECEIVED.—H. G.—M. L. S. Co.—W. R.—E. K. M.—L. A. F.—N. F. and Sons.

Correspondence.

VERY LIMITED COMPETITION!

To the Editor of the BUILDING NEWS.

SIR,—Might I venture to bring the inclosed interesting communication before you, the result of a number of unqualified persons practising in this town under-rating and under-selling the profession? The client who requests the attention of architects is the owner of a small public-house, and the contract, if let, would run to £1,200. I need not tell you that the qualified practitioners in this town returned the letter—with thanks!—I am, &c., R. M. LOGAN.

Francis-street, Dundalk, July 6.

[COPY.]

94, Park-street, Dundalk.

DEAR SIR,—I purpose to have erected two business-houses on site of my own and adjoining house in Park-street and Rampart-lane, for the wine and spirit business, with grocery and provisions if I feel inclined. A neatly-fitted bar, with shop windows in each street, and door on the corner. Rooms and kitchen on ground floor, cellar or basement for storing spirits, first floor drawing, dining, and bedrooms, with bedroom attics.

The second house to be a lock-up shop, with small room at rear on ground floor; a hall entrance to be provided between the shop fronts in Park-street, to lead to rooms on first floor of second house, which can be used for offices or otherwise. The usual sanitary arrangements for each house. A certain portion of the entire rear to be spaced off for stabling, and stores over same, and the remainder for an open yard, with gate entrance from Rampart-lane. A hall entrance to licensed house adjoining gate entrance in Rampart-lane. The facings of the houses can be done in stock brick, with terracotta fancy facings if required. Two stories, with attics. Queen Elizabethan style suggested.

I have indicated above what are my requirements for the houses, so far as I can see at present. I require a plan and design for the two houses and offices, with specification and bill of quantities, and estimates of the probable cost. I shall pay for the design, plan, specification, and bill of quantities I consider most suitable, £5 5s., and reserve the right to make terms with designer as to carrying out the work under his supervision or direction. The design, plan, and specification I accept to be my sole property. The premises can be inspected and measured at any time during the coming week.

I shall receive designs, plans, specifications, bills of quantities, and estimates until May 10, 1899.

Your obedient servant,
CATHERINE HEARTY.

TOXTETH GUARDIANS v. ELLISON.

SIR,—I shall be glad if you will, in your next issue, correct some inaccuracies that you have published in your issue of to-day.

1. I was not employed to watch the defendants and builder; nor did I act as detective, *vide* official referee's summing up to the contrary.

2. It was proved beyond doubt that the plaintiffs had not got value for their money, *vide* verdict, and defendant's own figures, £1,065 excesses in quantities.

3. The statement brought forward *after* putting in defence and counter-claim was one that was merely imaginary, and which was rejected.

In my own defence, I may say that everything I did was fair, square, and above board, and with the full knowledge of both defendants and builders, and litigation was never thought of until long after the completion of the works, when the defendants wrote and said the contractors were making no claims for extras, although the board had given orders to the amount of nearly £100.

Thanking you in anticipation.—I am, &c.,
HENRY HALLARD, Clerk of Works.
Everton, Liverpool, July 7.

Intercommunication.

QUESTIONS.

[12264.]—**Blue Colour in Wall Stones.**—A contractor allowed a load of sand from a gasworks to be mixed with the mortar, and now it begins to turn the wall stones a blue colour. Is there anything to be done to bring the stones to their natural colour? Any information would be gratefully accepted.—MORTAR.

[12265.]—**Water in Cellar.**—I am a young fellow, who some two years ago sunk my all in the erection of two houses on a plot of land, one of which I live in. The builder (a friend) designed the plans. Apparently it seems impossible to get the cellars clear of water, and now dry rot has started in them. The latter are not connected with the main drain, but a tile drain round the cellars is. The problem is, where does the water come from, and how to stop it? The builder has studied and done his best to solve the problem. Can anyone offer help?—OLEV.

[12266.]—**Pine.**—Can any correspondents give reasons why more Carolina, Oregon, or Indian pine is not used in London for joinery than at present? The wood is sound, and can be obtained in large sections free from centres, and clean. The writer is anxious to know if there is any objection to this wood, if it decays more rapidly than yellow deal, is affected by dry rot, warps or twists, or if the surface becomes uneven by shrinking?—D. H. G.

[12267.]—**Stone Heads.**—One very often sees door and window openings of considerable width covered by straight stone heads, sometimes in one stone. The same thing occurs in Classic porches, where the columns are widely spaced. Are these heads merely an exterior casing to iron girders at the back, and which really carry the weight over? What should be the maximum span to be covered by a straight Bath stone head in one piece, without any ironwork at the back?—DOUBTFUL.

REPLIES.

[12260.]—**Sea Sand.**—The best method of preparing sea sand for building purposes is to burn the salts out by building a stack of sand and small coal, or other combustible material, in alternate layers of, say, 9in. of sand and 4in. of fuel, and firing the lot. The sand can afterwards be screened. Any quantity can be prepared in this way at little expense.—FRANK WRIGHT.

Coroner Yates investigated last week at Northwich the circumstances attending the mysterious death of Owen Thomas (45), of Northwich, treasurer to the local branch of the Amalgamated Society of Carpenters and Joiners. His disappearance on Wednesday led to inquiries, and ultimately to the discovery of his body in the river Weaver. The widow stated that the deceased had never recovered from influenza. Secretary Smith found about £124 of the society's funds missing. Another witness said the deceased was upset about a dishonoured cheque for £120. A verdict of suicide while temporarily insane was returned.

The guardians of Greenwich Union have purchased a site of 60 acres at Halfway-street, within ten minutes of Sidcup station, at a cost of £15,000, to erect schools on the cottage homes principle for about 6,000 children of the Sutton and Banstead-road schools, by order of the Local Government Board. The guardians have instructed Mr. Thos. Dinwiddy, F.S.I., to design the necessary buildings.

LEGAL INTELLIGENCE.

Right to Lateral Support.—The hearing of actions against the Warwick Revolving Tower Company, Morecambe, by three adjoining property owners (which had occupied the attention of Mr. Justice Wills and a special jury at Lancaster for two days) was concluded on Saturday evening. Mr. Joseph Fawcett, solicitor, owner of No. 4, Highfield, claimed £532 10s. 9d. for depreciation of the house, No. 4, Highfield, and £282 10s. 9d. for repairs, whilst the tenant, Mr. Frankland, claimed £85 19s. for repairs he had had to execute and for direct loss; Messrs. Nelson and Webster claimed £188 for depreciation of the value of No. 3, Highfield, and £33 17s. 8d. for special damages; and Dr. Tidswell, owner of No. 4, Highfield, claimed £150 for depreciation of the value of the house; and Henry Hutton, the tenant, claimed £27 17s. 4d. for repairs for which he had paid. The case for the plaintiffs was that the erection of the revolving tower—a structure of great weight—on unsuitable soil and in the midst of the houses, had had the effect of depressing the soil on which it rested, and, dragging the soil from underneath the houses, had caused cracks in the outer and inner walls, and caused the houses to become more or less dilapidated. Mr. Frankland also claimed damages for the loss of a crop of grapes caused by the glass of his vinery being made opaque as the result of the discharge of liquid impregnated with oxide of iron from the defendant's tower. The defence was that the tower was put upon a suitable bed, on hard marly soil, that there had been no settlement or subsidence of the tower buildings, and that there was no appreciable vibration. It was also contended that the houses were slight in construction, that the gable wall was faulty in regard to its foundation, and that the cracks and damages to the houses recently observable were due to the subsidence of the foundations through moisture being withdrawn from the land in the tower excavations, but which the defendants could not be held responsible for. A number of expert witnesses were called, including Mr. I. Moore and Mr. S. Wright, of Morecambe, for the plaintiffs, and Mr. Wainwright, Liverpool, and Mr. Hall, London and Scarborough, for the defendants, The jury returned a verdict for the plaintiffs, and awarded Mr. Frankland £65 4s. 8d., Mr. Fawcett £482 7s. 9d., Messrs. Nelson and Webster £133 17s. 8d., Mr. Hutton £27 17s. 4d., and Dr. Tidswell £75—or £784 12s. 5d. in all.

Commercial Value of a Sea View.—In the case of Simmons v. The Duke of Devonshire, the plaintiff, Henry Mandy Simmons, the owner of certain freehold property, Nos. 1, 2, 3, and 4, Mostyn-terrace, Eastbourne, claimed damages for breach of certain covenants contained in four indentures, dated July 5, 1880, under which the duke's predecessors undertook not to build or allow to be erected between the said houses and the sea any building except summer-houses or ornamental pavilions not exceeding 10ft. in height. The defendant, while denying his liability, paid the sum of £600 into court. The case arose out of the erection at Eastbourne of the Terriss Memorial Lifeboat House, which was subscribed for by the public after the murder of the late William Terriss, the actor. The plaintiff was the proprietor of the Alexandra Hotel, and of the two adjoining houses, and he claimed that his property had been seriously deteriorated owing to the fact that uninterrupted sea views command fancy prices. At first it was supposed that the memorial had been erected on War Office property, but afterwards it was discovered that a mistake had been made. The plaintiff was called, and stated that he had paid £18,000 for the property. He considered that the annual loss he had sustained was £350. Experts were called, who fixed the annual loss at from £250 to £350 per annum, and the gross value at from £5,500 to £5,750. A tenant of one of the houses said that last year he lost £60 owing to the obstruction of his "view." While Mr. Bray, Q.C., was opening the defence, the jury stopped the case, and assessed the damages at £200, subject to the memorial being slightly lowered, as had been already agreed upon. Judgment accordingly, the question of costs being reserved.

The London County Council's Building Regulations.—On Monday, at the Surveyors' Institution, Westminster, a tribunal of appeal, consisting of Mr. Arthur Cates (chairman), Mr. J. W. Penfold, and Mr. A. A. Hudson, heard the appeal of Mr. R. H. Barnes, the owner of property at York-road, Lambeth, against the refusal of the Building Committee of the London County Council to pass his plans for rebuilding his premises. Mr. Stuart Bevan represented the applicant; and Mr. Seymour Berry appeared for the London County Council. The appellant is the owner of the lease of 54 and 56, York-road, Lambeth, the property of the Ecclesiastical Commissioners. No. 56 is at present a public-house, and the appellant proposed to pull down both properties and rebuild them as licensed premises. In April last he instructed Mr. Robert Sawyer, F.R.I.B A., to draw out plans, which he submitted to the local surveyor, and at his invitation sent to the London County Council. These plans were declined by Mr. Wyatt, acting for the County Council; and accordingly amended plans were sent in, which were no more successful. It was against the refusal of the Council to pass these amended plans that the appeal, under Section 41 and 43 of the Building Act, was made. The premises had a frontage of 54ft. to York-road, and a return frontage of 40ft. to Vine-street, on which it was proposed to build a large dining-room. They had provided an open space of 150ft., which was all they were legally required to do. The licensing justices had considered the plans and had agreed to sanction the scheme. Mr. Seymour Berry, for the London County Council, urged that the appellant should so notify his plans as to give an equivalent air space to that at present existing. The chairman said the members of the tribunal, having viewed the premises, thought they might rightly and properly allow the appeal. They made no order as to costs.

Advances on Uncompleted Contracts.—Fry Brothers v. Corbett.—This action was recently heard in the Queen's Bench Division before Mr. Justice Grantham and a special jury. The plaintiffs were a firm of engineers and contractors, and the defendant was Mr. Cameron Corbett, M.P., who has a large building estate near Lewisham. The action was brought to recover £4,372, being the balance alleged to be due on a contract for making up roads on this building estate. The question of amount was not in dispute, but the parties desired to have a decision upon the question of principle, as to the mode in which the payment for this contract should be made. The roads had to be laid out to the satisfaction of the local authority, but a certificate could not be given until the buildings had been put up, and therefore the roads could not be completed until then. From time to time the defendant had paid sums on account, but he contended that he was not bound to pay until the roads were completed. The plaintiffs contended that, as completion could not be effected until the buildings had been put up, and as Mr. Corbett could put up the buildings when he pleased, they were entitled to a proportionate payment for the work done. The defendant said that he was not bound to pay anything in advance, but that, as a matter of grace, he was prepared to pay the plaintiffs' out-of-pockets, and he had, in fact, paid £17,000 out of £21,372. No written contract had been made, and the question turned chiefly upon the correspondence. It was mentioned that the business relations between the parties were still maintained. Mr. Justice Grantham, in summing up, asked the jury whether the defendant was to pay everything up to the full value of the work done, as it was going on, or whether he was bound only to make reasonable advances, and whether the advances that had been made were reasonable. The jury found that the defendant was only bound to make reasonable advances, and that he had done so. Upon these findings his Lordship gave judgment for the defendant.

Novel Workmen's Compensation Case.—A novel point, under the Workmen's Compensation Act was raised in the Westminster County-court, by the case of Henley v. Young and Co. Henley is a carpenter, and, having finished the job he was engaged on, was given notice. According to the rules of the trade he was entitled to one hour's notice for collecting his tools and one hour's pay for grinding them. It was during the hour allowed for collecting the tools that he fell down a hole and hurt his ribs. The respondent contended that the accident did not occur while he was working for them. He could have collected his tools at once, drawn his money, and left the job. The Judge held that during that hour a workman was still in the service of the employers, but in this case the accident was not in the course of any service to the employers, and therefore there would be judgment for the respondents.

A Leaky Reservoir.—A common jury was empanelled at the Assizes at Chelmsford last week to try an action brought by William White, cement manufacturer, Abergavenny, Wales, against Thomas Smith, surveyor, Springfield, to recover £183 9s. 6d., alleged to be due for goods sold, wages, and expenses in connection with cementing the bottom of a pond at Great Baddow. Defendant counter-claimed for £343 9s. 6d., damages alleged to have been sustained through the failure of the plaintiff to make the pond water-tight, as agreed. The defendant entered into a contract to make water-tight a pond belonging to Mr. H. W. Smithers, of Baddow Court, and for that purpose he used some of the plaintiff's "Hygeian rock" composition. The composition was supplied by the plaintiff, who at first estimated that four tons, at £5 per ton, would be required; but this was admitted afterwards to have been an erroneous calculation, and ultimately 29 tons were used. The composition was put down by one of the plaintiff's men named Pugh, and when the job was completed it was found that the pond was not water-tight; hence the present action. Plaintiff contended that the leakage was due to the faulty foundation, and to the composition being spread over it too thinly; and that the man who did the job was simply lent to the defendant, under whose orders he worked. For the defendant, it was urged that the plaintiff contracted to make the pond water-tight for £20, and that the man who did the work was his servant. Plaintiff stated that he merely agreed to supply the composition at a certain sum per ton, and that its thickness in the pond was only ⅜in., instead of being ½in. or ¾in., as he had written to the defendant that it should be. The work was very badly done, and he admitted that he told Pugh that he "ought to have six months" for doing it so badly. He had, however, nothing to do with the way in which the work was executed, as Pugh took his orders from the defendant. Defendant said he was told by the plaintiff that four tons of the composition would be sufficient. He never interfered with Pugh, and when Pugh had finished it looked all right, but not a single yard of the stuff was now water-tight. Mr. H. W. Smithers, of Baddow Court, also gave evidence. In reply to Mr. Lowe, he admitted that he wrote that Pugh had attended diligently to his work, and performed it under circumstances which must have been most difficult. Defendant was not often at the reservoir; at other times he ordered the bricks to be placed closer than they ought to have been put; and he seemed to interfere with Pugh. His Lordship, in summing up, said there seemed to be no ground for thinking there was a guarantee that four tons of the composition would be sufficient. An unfortunate mistake was made; but that would have been corrected had the defendant read the plaintiff's trade pamphlet. He asked the jury to say whether there was a guarantee by the plaintiff that four tons of the composition would suffice, and whether there was a positive contract on the part of the plaintiff to make the pond watertight; and, if so, had he broken it? The jury answered both questions in the negative; and judgment was entered for Mr. White on the claim and counter-claim.

Private Streets Works Appeal.—Twickenham Urban District Council v. Munton.—Judgment was given in the Court of Appeal last week by the Master of the Rolls, the President of the Probate Division, and Lord Justice Romer in an appeal by the defendants, Mr. F. K. Munton and others, from a decision of Mr. Justice Stirling's, dated December 10 last. The plaintiffs claimed that they were entitled under section 13 of the Private Street Works Act, 1892, to a charge on certain houses and lands vested in the defendants and situate in Montpelier-road, Twickenham, for the apportioned amount of expenses incurred by the plaintiffs in executing private street works under section 6 of the above-mentioned Act, together with interest, and for consequential relief. The Private Street Works Act, 1892, was duly adopted for the district of Twickenham and came into operation on February 22, 1893. On June 27, 1895, the plaintiffs resolved with respect to Montpelier-road to do the various street works mentioned in section 6 of the Act, with the exception of lighting. The defendants gave no notice of any objection; but another owner did give such notice, and on January 1, 1896, the justices held that a part of Montpelier-road was a street repairable by the inhabitants at large, but that the remainder was a private street within the meaning of the Act, and they amended the plan, estimates, and apportionment so as to limit the operation thereof to the latter portion of Montpelier-road. The justices did not direct any fresh notices to be served, and no further notices were served. The defendants were willing to pay the sums mentioned in the summons provided the whole of Montpelier-road was repaired, but they objected that the repair of the portion to which the scheme of the plaintiffs had been limited by the magistrates was detrimental to them so long as the rest of the road remained unrepaired; and for this reason they resisted the summons on the grounds stated in his Lordship's judgment. It was decided by Mr. Justice Stirling, first, that the justices had not exceeded their jurisdiction in taking upon themselves the duties of the urban authority—that the amended resolutions, plans, &c., were meant to take effect as if they had been duly passed by the urban authority itself; and, secondly, that in depriving the defendants of all opportunity of taking objection to the works proposed to be executed the justices had a discretion which they had exercised, and were within their jurisdiction in so doing. From that decision the defendants now appealed. Their Lordships, without calling upon the respondents' counsel to argue, affirmed the decision of Mr. Justice Stirling, and dismissed the appeal with costs.

The warming of Myrtle-street Baptist Church, Liverpool, having been very unsatisfactory for a long time, it was decided to place the matter in the hands of Messrs. John King, Ltd., engineers, Liverpool, who recommended that the old apparatus be entirely removed, and that the church be fitted with their latest improved hot-water heating apparatus, and the work is now in progress.

Our Office Table.

Serious results are apprehended if the stone used by Lord Grimthorpe in his "restoration" of St. Alban's Abbey continues to show inability to resist atmospheric influences. A good deal of patching of new work has already taken place; but evidences on every hand point to decay in the new stone portions of the exterior. His lordship's "Roman" tiles are in no way affected by the atmosphere.

The gems of the Marlborough collection acquired by the British Museum at the recent sale are now on view in the Gold Ornament Room. Among those which belong to the Roman Age is a sardonyx cameo $8\frac{3}{4}$in. by 6in. The design is two busts confronted, apparently representing a Roman Emperor and Empress—probably Julian the Apostate and Helena—in the character of Isis and Jupiter Ammon. Next in size is a chalcedony representing the apotheosis of Trajan's sister Marciana, who, in the character of Juno, is being conveyed on the back of a peacock to the abode of the gods. Another is a sardonyx cameo of Agrippina the elder in a setting of the Cinque-cento period; and, fourthly, a cameo of the Emperor Claudius in sardonyx. Among the later gems is a double cameo with a head of Hercules on one side and of Omphale on the other; the latter head is believed to be Classical work, and that of Hercules to be an addition in Renaissance times. It is framed in a gold setting studded with diamonds and rubies, and enriched on the edge with a tracery in black enamel. Another mounted cameo is of 16th century work, and represents an emperor—possibly Lucius Verus—set in enamel and jewels arranged in intricate open work. Yet another Cinque-cento gem is a head from the hand of Il Greco, set in a pierced mounting enamelled with flowers.

In accordance with a scheme approved by Viscount Esher, secretary to H.M. Office of Works, the equipment of the reorganised fire brigade at Windsor Castle is being completed. A new engine-house has been erected, furnished with a fire-engine and appliances. The members of the brigade have been furnished by the Office of Works with serviceable uniforms. The brass helmets bear the Imperial monogram "V.R.I.," and the uniform tunic bears a badge containing the Royal Arms and the name "Windsor Castle Brigade." The newly-organised brigade will be periodically drilled by a superintendent of the Metropolitan Fire Brigade. The cost of the maintenance of the equipment and appurtenances of the brigade will be borne by the Office of Works.

At the meeting last week of the School Board for London, the Works Committee reported that they had given further consideration to the question of the unsatisfactory sanitary and drainage arrangements at the Brentwood Industrial School. In February last the Board considered reports of the committee on the same subject, in which the committee recommended the Board to confirm their action in calling upon Mr. Bradfield, the assistant architect for repairs, who was concerned with the sanitary arrangements of the school, to submit his resignation. The matter was referred back to the committee, and at a later stage the Home Office was requested to furnish the name of a surveyor or sanitary expert who might inquire and report to the Board as to the report of Mr. Bradfield, and as to the sanitary condition of the school. The Home Office nominated Mr. H. T. Seward, and upon his report the Works Committee now recommended that no further action should be taken with reference to Mr. Bradfield. The motion was agreed to.

The Palestine Exploration Fund held its annual meeting on Tuesday at the Royal Institution. Sir Charles Wilson described a recent journey he had made in Moab and Edom, and said that unless researches were rapidly made now, much that remained from the past would be lost in the transformation which Palestine was undergoing. The report, read by Canon Dalton, gave an account of the excavations on the historical site of Tell-es-Sâfi, supposed by many Biblical students to be the ancient Gath, begun successfully by the fund under Dr. Bliss and Mr. Macalister. The report acknowledged the services to excavators to Palestine of Professor Flinders Petrie by his researches in pottery at Tell-el-Hesy in 1890. During the last year £3,000 was contributed to the fund, but further help was needed. The excavations and researches of modern scholars had largely supported statements in the Bible, and the results went back to times even anterior to those of Scripture and reached even the prehistoric age. The report was adopted.

Old Sauchie Mansion House, a fine old roofless ruin adjoining the estate office at Sauchieburn, for a long period has been gradually getting into a dilapidated and ruinous condition, the result mainly of the luxuriant growth of the ivy clothing its walls. Miss Maitland has decided to preserve it. In carrying out this work, it was found necessary to tie the walls of the entrance hall together with malleable iron tie-rods. Parts of the walls which had fallen down, and other parts which had become loose, had to be taken down and rebuilt. The whole of the walls outside and inside were pinned and pointed with Portland cement. The accumulations of many years had to be removed from the top of the vaults, which were levelled up and covered with concrete to preserve the arches. The work is now nearing completion, and shows a very fine specimen of Domestic architecture of the latter end of the 16th century. When erected, the house had occupied two sides of a square, with the door in the angle, and consisted of an entrance hall, with the main stair leading up to the first floor. The rest of the ground floor was arched over, and the light penetrated the vaults from slits in the external walls. Over the vaults were placed the living-rooms, and over these the bedrooms. Turrets with fine moulded corbellings are placed on each of the corners of the north elevation, while in the centre of the east wall a bow window, carried on similar corbelling, contained the turnpike stair which led to the bedrooms. Another turret had at one time existed on the south-west corner of the entrance hall, but this had been removed at some previous alteration. The kitchen and offices of the old mansion have been incorporated into the present estate office; but the kitchen fireplace still remains, and is large enough to have roasted an ox whole at one time.

At the last meeting of the Conway Town Council the resignation was accepted from Mr. T. B. Farrington of the office of borough surveyor, and it was decided to advertise for a successor at £150 a year. A vote of thanks was passed to Mr. Farrington for his faithful services during the past twenty years, also a further motion that the services of Mr. Farrington as consulting engineer be retained at a fee of £20 a year, and a commission of 4 per cent. upon any work supervised. The committee recommended that Mr. Farrington be paid £50 for services rendered in connection with the Gyffin sewerage. Mr. Farrington said he considered this inadequate. Neither was he satisfied with the £20 a year retaining fee. There was no guarantee that he would be employed to complete the work, the plans of which he had prepared. His self-respect was worth more than £20 a year, which he must decline, at the same time thanking the members for their kind remarks.

In reporting to the Glasgow Corporation on the past year's working of the tramways, Councillor Paton said that during the next eighteen months the very large reserve funds, about £170,000, would probably be all swallowed up by the conversion of the system from horse to electric traction. They looked forward to the disposal of the present cars and horses with very little fear of any loss. With the electric cars they had earned 1s. 2d. per car mile as against $11\frac{1}{2}$d. with the horse cars. With the introduction of electric traction, the traffic had increased enormously. Another result of the introduction of electric traction was just as extraordinary—namely, that the working expenses per car mile were only $6\frac{1}{2}$d. as compared with $8\frac{1}{2}$d. with horse traction, and as the system was extended it would show still better results. Bailie M'Cutcheon mentioned that the silver and copper coins handed over by the conductors to the treasurer of the tramways in the course of last year weighed 291 tons.

The Lodge of Edinburgh (Mary's Chapel) No. 1 having completed its minutes for three hundred years, celebrated the unique event by a grand banquet in the large concert hall, George-street. The room was decorated in a very pleasing manner, and excellent music was provided. A number of ladies were admitted to the gallery, and pipers of the Gordon Highlanders paraded the room at intervals. The chair was occupied by the Master, Mr. P. L. Henderson, architect, and among the guests were the Right Hon. the Earl of Haddington, Admiral Campbell, the Right Hon. the Earl of Rosslyn, Sir Lewis McInn, Mr. W. W. Robertson (architect for Scotland Office of Works), and Mr. Hippolyte J. Blanc, F.R.I.B.A. The toast of "The Sister Grand Lodges" was responded to by the senior English Mason present, Mr. Henry Lovegrove. The old minutes contain interesting references to the past and the rise of speculative Masonry. During the evening telegrams were received from the Prince of Wales, the Duke of Abercorn, and others.

At Boston, Mass., crude oil has been pronounced a failure in laying the dust on the driveways in the parks. Because of its successful use in allaying the dust nuisance on railroad beds, and its use on highways in some Western localities in hardening muddy spots, it was thought to effect an economy by substituting it for water on the parkways. But the important fact was overlooked that railroad trains run on tracks. When the oil was applied to the park roadway it was found that the compactness which is the result of the use of water on dust was absent, and that as soon as traffic began to go over the road the ground assumed a disagreeable "mealiness." People also began to complain of the odour which arose from the oil, and to say that if the oil was used extensively the park would not be an agreeable place in which to drive. The bicyclists, too, had a grievance, and said that the oil would injure the tires of their wheels. So, considering everything, the Park Commissioners decided to make no more experiments with crude oil.

A recent issue of an American trade journal contains a paragraph on the growth of the Portland cement industry in the United States, in which it is said that "During the past year, the leading manufacturers of Portland cement have begun to cultivate systematically the export field, and there is no question that soon American Portland cement will be laid down in large quantities in many foreign markets." Cement is, says Mr. Rufus Fleming, the U.S. Consul at Edinburgh, in a recent report to his Government, extensively used in Scotland. The imports of this article at the port of Leith are annually from 55,000 to 65,000 tons. It comes chiefly from England, although Belgium furnishes a considerable quantity. A commission agent called at this consulate a few days ago to make inquiry about American manufacturers of Portland cement. I gave him the names of several companies. If the article can be delivered here at a reasonably competitive price, it should soon get permanently into the market, as American roofing slates have done during the last ten months.

CHIPS.

A new organ, built by Messrs. Samuel and Twyford, of Dalston, was opened last week in the recently-restored parish church of Tacolnestone, Norfolk.

The Dawlish Urban District Council received on Monday 44 applications for the vacant post of surveyor and sanitary inspector. After reducing the list to ten, the meeting was adjourned until Tuesday next. The salaries quoted ranged from £80 to £275, and amongst those applying were a plumber, a mason, and a foreman carpenter.

At St. Giles's Parish Church, Newcastle-under-Lyme, a new font, erected at the cost of Mr. J. Griffith, town clerk, has been given. The basin is of alabaster, standing on eight shafts of red Devonshire marble, with alabaster caps and black marble bases, a base and platform of polished Hopton Wood stone. The work has been executed by Mr. Robert Bridgeman, sculptor, of Lichfield, from designs of Mr. John Lewis, architect, of Newcastle-under-Lyme. The old font has been refixed at the west end of the south aisle.

The foundation-stone of the new hospital at Boscombe, Bournemouth, was laid on the 28th ult. The building is being erected from plans by Mr. G. A. Bligh Livesay, F.R.I.B.A., of Boscombe, and was illustrated in an issue of March 24 last. The portion in course of erection consists of ward pavilions Nos. 1 and 2, their kitchens and office, and an isolation block, and parts of main corridor. The ward pavilion blocks are designed to take a second floor over in the future, thereby doubling the number of beds, and ultimately reaching a total of 66 beds. The whole of the buildings, with the exception of the administration block, will be built on arches, keeping the main floor level 6ft. above the ground. The builders are Messrs. Miller and Sons, of Bournemouth, whose contract was accepted at £8,940.

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SPRINGBURN HALLS, GLASGOW. — TECHNICAL SCHOOL, TROWBRIDGE.—PORTION OF A DESIGN FOR MUNICIPAL BUILDINGS.

Our Illustrations.

SPRINGBURN HALLS, GLASGOW.

We publish to-day the three premiated designs for the new public halls for Springburn and Cowlairs. These were chosen from nineteen designs submitted by architects practising in the city of Glasgow. By comparing the plans of the three chosen schemes an interesting comparison may be made as to their respective merits, and being so diverse in their arrangement, the plans will be found of special interest.——*The Selected Design.*—The committee, with the assessors and the curator, unanimously selected from a leet of three the set of plans sent in by Mr. William B. Whitie, architect, as being best suited for the district. Their recommendation was made to the corporation, and was unanimously confirmed. The building will occupy a prominent site at the corner of Millerbank-street and Keppochhill-road, and the drawings which illustrate this design show the two halls placed together longitudinally on the site, and so arranged that while the entrances, exits, and retiring rooms for each are quite separate and distinct, they may be let together and used *en suite* when occasion requires. The level of the principal floor has been placed a few feet above the level of the adjoining streets, to permit the proper lighting and ventilation of rooms in basement. The main hall measures 77ft. by 50ft., exclusive of crush hall and orchestra, and provides comfortable seating accommodation for 1,209 persons. The principal entrances are from Millerbank-street, and open into a spacious crush hall, from which any part of the hall may be reached. Ample exit accommodation is provided at each end of the hall, both from area and gallery levels. The total widths of exits measured at the outer doorways is 27ft. in the clear—a space of more than 10ft. in excess of that demanded by the building regulations. In the dividing wall between the two halls are two sets of double doors, which will be opened when both halls are used *en suite*. The platform entrance is from Kappochhill-road, and communicates by means of a corridor under the platform with the retiring rooms which overlook the lane. On the ground floor a committee-room is shown, which will be used as a platform- or green-room, while immediately above are situated the dressing-rooms for the lady and gentlemen artistes. A staircase, starting from the platform corridor, gives access to these, and also the platform, from a half landing. An access to platform is also shown at south end of platform corridor. The platform entrance will also serve as entrance for reserved portion of area. Lavatory accommodation is provided to all retiring-rooms, and a public lavatory will communicate with the crush-hall. There is a cloakroom in connection with the ladies' and gentlemen's retiring-rooms in basement, placed so that the attendant is able to overlook both of these rooms. Access to ladies' and gentlemen's rooms from crush-hall is by means of the north and south staircases respectively. In the basement under the main hall a large store for forms, &c., is provided, together with three committee-rooms, which are placed so that they are lighted and ventilated to an area to Keppochhill-road. It is proposed that these rooms should be divided by movable partitions. Access may be had either from the platform entrance or the south exit in Millarbank-street. This allows these rooms to be let separately even when the main hall is occupied. The lesser hall measures 52ft. by 27ft., and provides seating accommodation for 408 persons. The principal entrance is from Millarbank-street, and from the entrance hall a staircase leads upward to the gallery and downward to basement. There are emergency exits at each side of the platform. These communicate with corridor which leads direct to lane. The artistes' room, with ladies' and gentlemen's lavatories, is situated in basement, and is reached by means of a stair from lobby on north side of platform. From this lobby a flight of steps leads up to platform level. The cloak-room accommodation is arranged with access from entrance hall, similar to, but on a smaller scale than, that for main hall. The kitchen is placed in the basement under lesser hall, and the necessary gas-cooking apparatus is indicated, while a lift for the convenience of purveyors is provided from the kitchen corridor to the service lobby at south side of platform. The corridors in basement are of ample width, and are so arranged as to facilitate communication with the various staircases. It is proposed to heat the building by low-pressure steam in pipes, coils, and radiators. Electric fans placed in roof will draw off the foul air, and fresh air will be admitted behind the heating coils. All sanitary appliances will be of the latest type. The main roofs will be carried on steel principals, and it is proposed that balconies should be supported on steel cantilevers built into the wall. The materials for the exteriors will be red freestone for masonry and green Westmoreland slates for roofs. The cubical contents of the whole building, calculated accurately in the manner required by the conditions, amount to 456,196ft. The elevations and view show the external treatment adopted. The work is to be proceeded with at once.——*Premiated Designs.*—Messrs. John Thomson and R. D. Sandilands, the authors of one of the two premiated designs, which we understand were placed equal in merit, have located their large hall 7ft. above the street level and the small hall about 7ft. below, in order that the big hall, which is the essential part of the scheme, should not be interfered with by the smaller hall and the committee rooms. The cloak-rooms are placed right and left of the principal entrance in Millerbank-street. The exits are numerous, and there are four staircases from the gallery—two at each end. The entrance-hall to the small assembly-room is reached by a flight of steps from Kappochhill-road. The artists' rooms are placed next the platform, and are entered from the same thoroughfare. The front and side walls are intended to be built of ashlar. The back gable and all internal walls are proposed to be built in brick. Cast-iron pipes were suggested for all drains. Red pine to be used for joists, and white pine for the roof spars and sarking. The hall roof-trusses to be in steel built-up framings. Elterwater green slates are proposed for the roof coverings. The estimated cost is set down rather below the sum of £12,000. Messrs. Watson and Salmond, the authors of the other premiated design, write as follows:—"Before deciding on our scheme for the above, we tried to meet the views of the corporation and give them the two halls side by side. In our opinion the ground at their disposal was not suited for such an arrangement, being too narrow, thus making it necessary to dispense with side corridors if the halls were to be so placed. We therefore decided on an octagonal plan for the large hall, which we believe is adapted to the squareness of the site, while giving a good floor area with convenient gallery. It also admits of the small hall being placed on the ground level. The elevations are treated in a simple manner, expressing the nature of the building, and depending on the general mass for effect, as the cost of the buildings is limited. The drawings herewith reproduced will otherwise fully explain themselves."

TROWBRIDGE TECHNICAL SCHOOL.

The drawing shows the principal entrance and staircase windows, &c., of the building, the materials being Bath stone for the wall facing, and red tiles for the roofs. We illustrated the plans and general drawings of this school in the Building News for Aug. 5, 1898. Mr. Linsey, of Trowbridge, is the builder. The architect is Mr. Thomas Davison, of Great Ormond-street, W.C.

PORTION OF A DESIGN FOR MUNICIPAL BUILDINGS.

This drawing, by the same architect, is an enlargement of a part of a design submitted in competition, local stone and red tiles being the materials proposed.

COMPETITIONS.

Frome.—The School of Science and Art competition at Frome was settled a short time since, the first premium being given to Messrs. Silcock and Reay, of Bath, and the second premium was awarded to Mr. Robert E. Brinkworth, F.S.I., of Chippenham. The cost is stated at rather more than £2,000 for the building.

Okehampton.—Six months ago, acting under the advice of the Local Government Board, Okehampton Board of Guardians resolved to build a new workhouse in preference to the erection of a new hospital and tramps' ward. Advertisements were issued for competitive plans, a premium of 50 guineas being offered for the best plan, and 25 guineas for the second. Eleven sets were sent in, and on Saturday the Guardians awarded the first prize to Messrs. H. W. Wills and John Anderson, A.R.I.B.A., of Postern Buildings, 40, Castle Bailey-street, Swansea; and the second prize was awarded to Mr. J. P. Kay, of 34, Prudential Buildings, Park-lane, Leeds. The new building will be a plain one, and will be erected on the present site. The cost will be about £8,000.

CHIPS.

Memorial-stones of new Baptist Sunday-schools in High-street, Old Basford, Nottingham, were laid the other day. A central hall to seat 1,000 persons is included in the scheme of the buildings, which are estimated to cost about £3,500.

Messrs. Vickers, Sons, and Maxim, Limited, have purchased the famous Atlantic liner *Alaska*, built by John Elder and Co. for the Guion Line, in her day the greyhound of the Atlantic, with a view of utilising her moored in the docks at Barrow as a floating home for about four hundred of their workmen. There is a very great scarcity of house accommodation at Barrow.

The foundation-stone of a new church in connection with St. Augustine's Mission, Lillie-road, Fulham, was laid last week by the Marquess of Lorne. The portion of the church now to be built includes the nave, aisles, and baptistery, and will cost £7,000, of which about £5,000 has already been raised. Messrs. Cutts are the architects.

Hughenden Manor, the seat of the late Earl of Beaconsfield, is undergoing extensive alterations, and the historic residence is also being enlarged by the erection of a new wing, upon which Mr. Coningsby Disraeli, M.P., is expending a considerable sum of money.

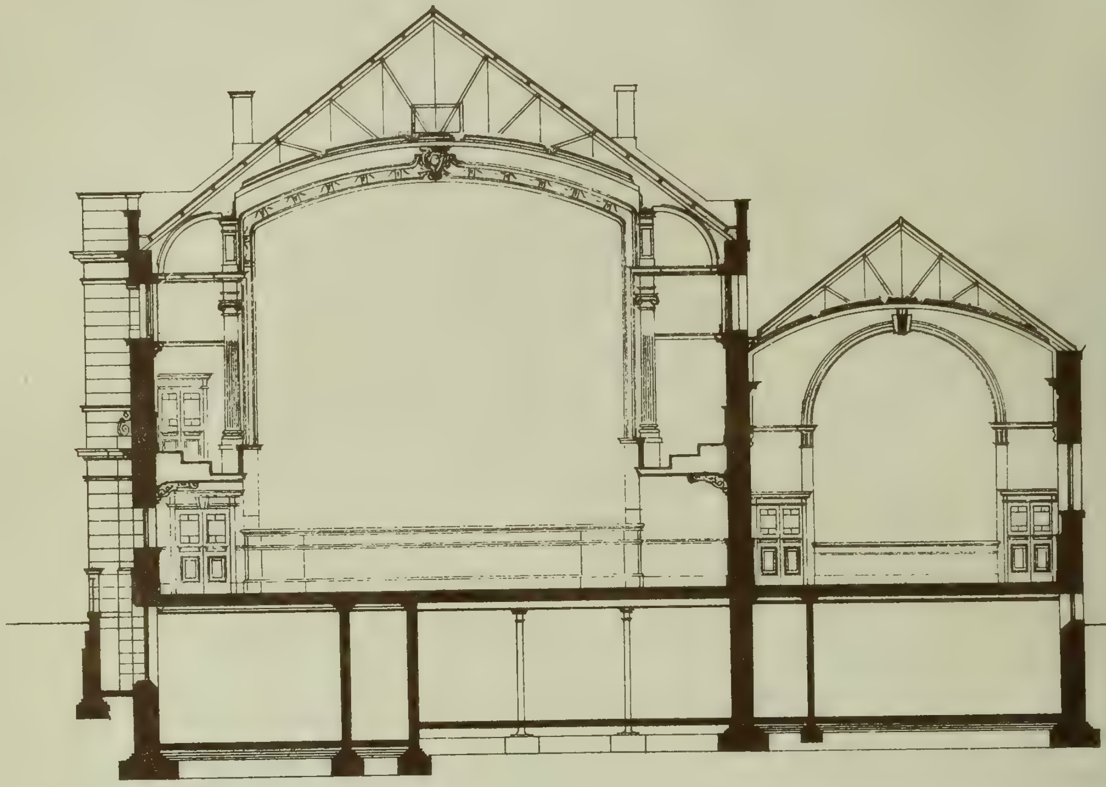
The foundation-stone of new artisans' dwellings was laid in Wyggeston-street, Burton-on-Trent, last week. Each block will contain a living-room 120ft. square, kitchen 11ft. by 9ft. 3in., and pantry on the first-floor bedrooms, the chief one being 15ft. by 12ft. The fronts of the cottages will be of red facing bricks and the roof covered with red tiles. They are built to let at 4s. a week. Mr. T. Jenkins, of High-street, Burton-on-Trent, is the architect, and Mr. Henry Edwards, of the same town, is the contractor.

The City Council of Liverpool have adopted plans for three new district fire stations proposed to be erected in Boundary, Grafton, and Harper streets. Application will be made to the Local Government Board for sanction to the borrowing of £28,650, the amount required to carry out the works.

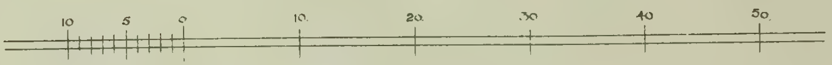
Owing to the dilapidated state of the old vicarage at Egloshayle, near Wadebridge, it is about to be replaced by a new one. Plans (prepared by Mr. Edmund Sedding) have been approved by the Ecclesiastical Commissioners, and a grant of £1,000 has been given towards the new building, which is to cost £1,300. During the removal of the old vicarage, part of a 13th century window was found built up in a thick internal wall. A nearly complete 16th-century window had been built up on the north side, and a cusped-headed 15th century window has been also preserved, which was found in another part of the same wall. It is proposed to introduce these fragments of old stonework into the new building.

The London County Council again discussed on Tuesday the Works Department, which was shown to have involved the Council since 1892 in a loss of £45,000. It was pointed out, however, that under the present management there had been a saving.

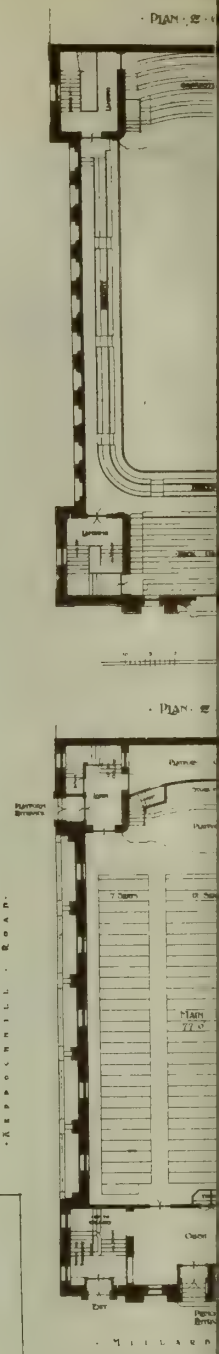
·SPRINGBURN HALLS GLASGOW·

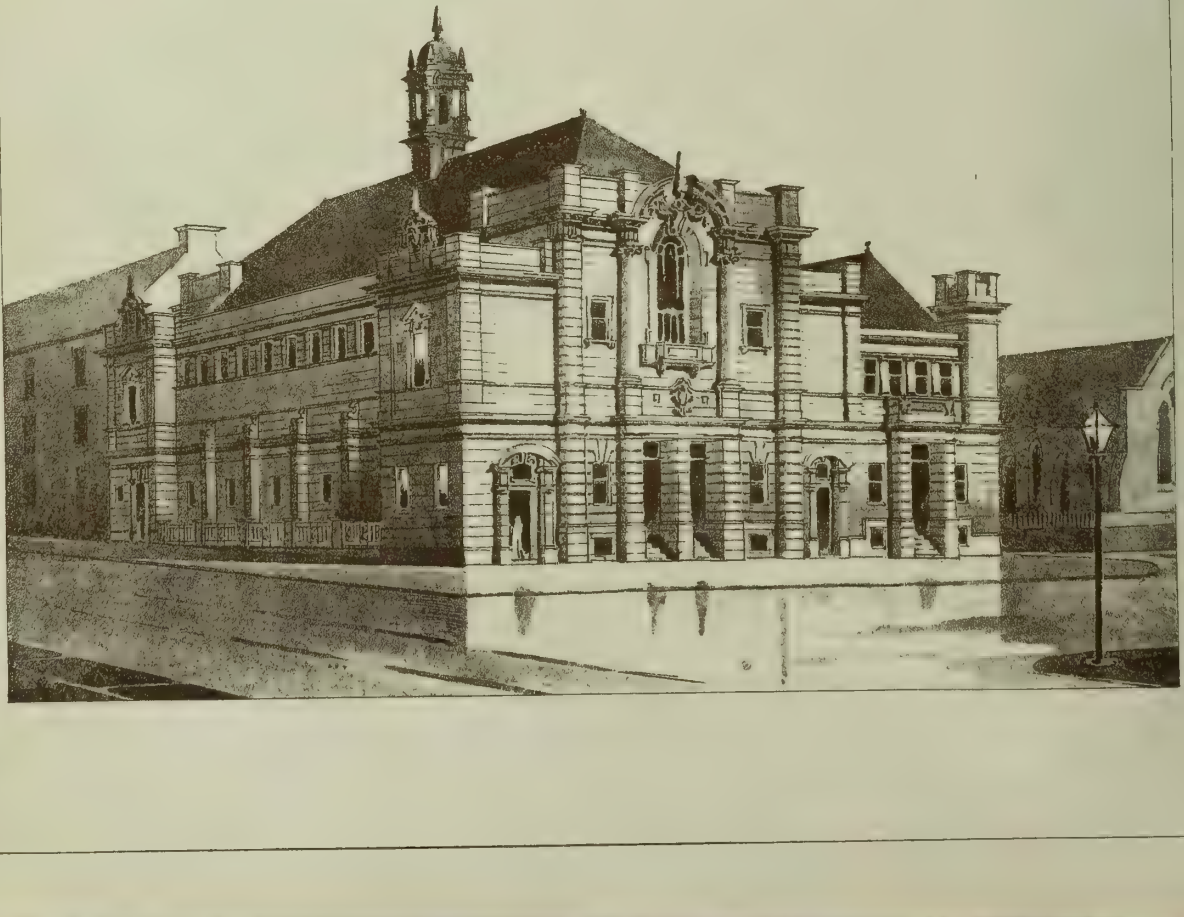


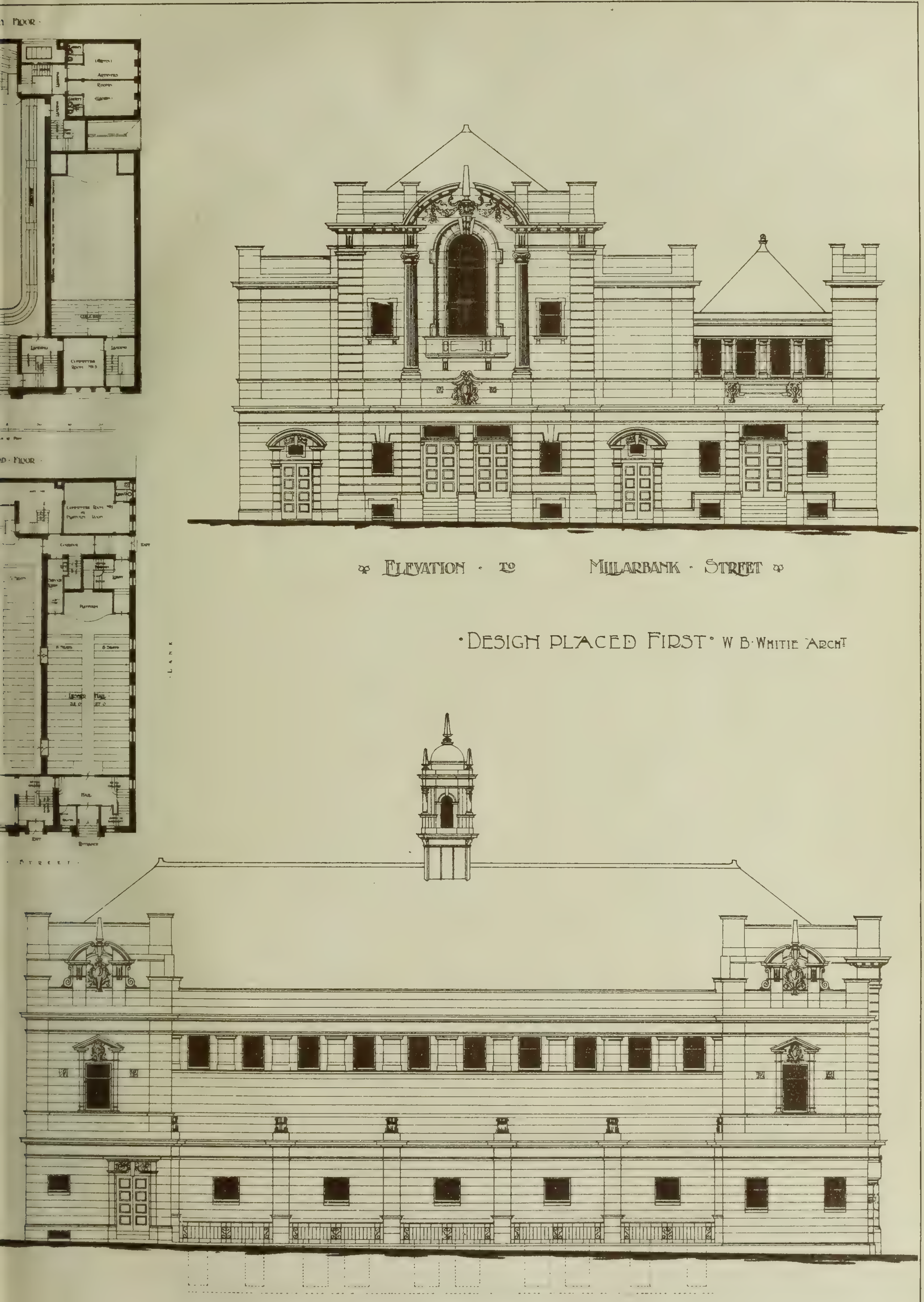
CROSS · SECTION



· SCALE · OF · FEET ·





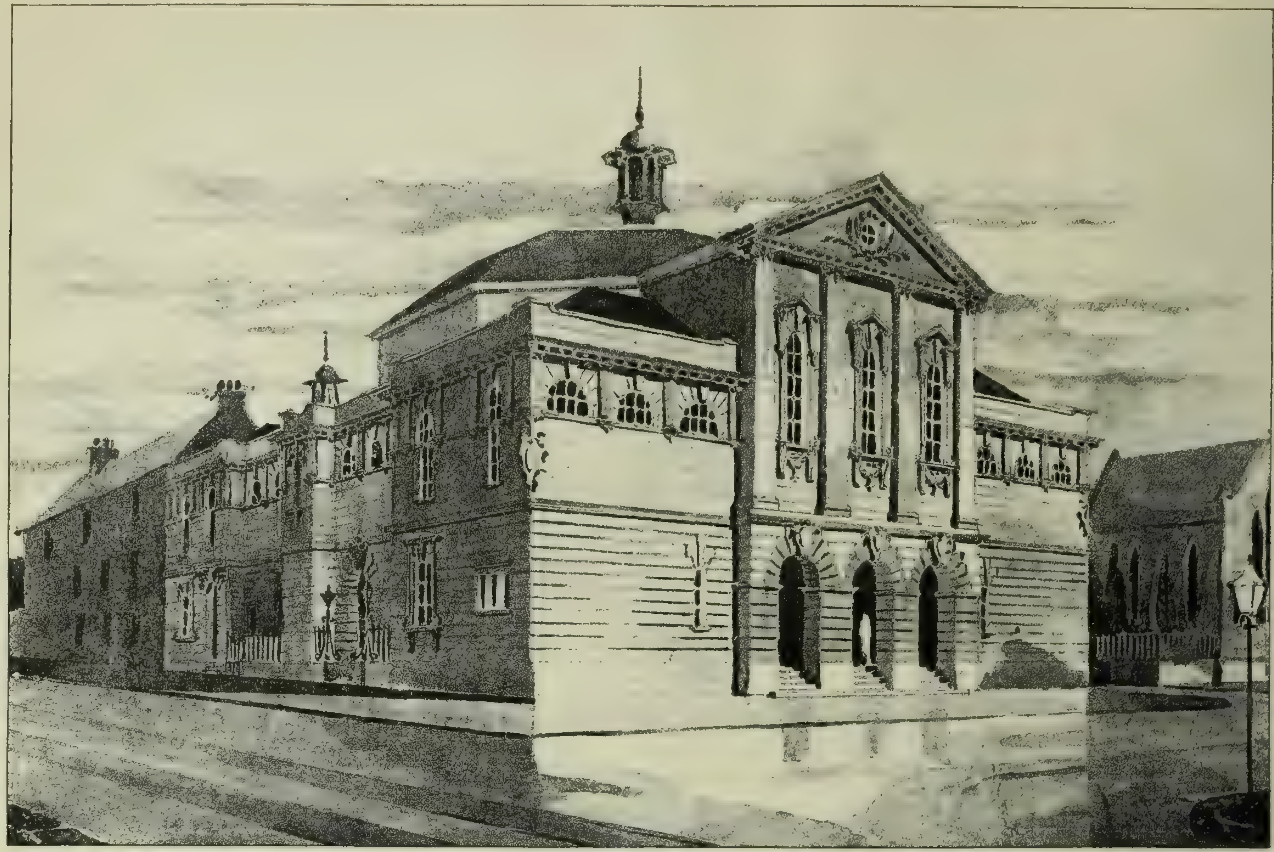


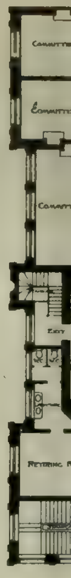
Elevation · to Millarbank · Street

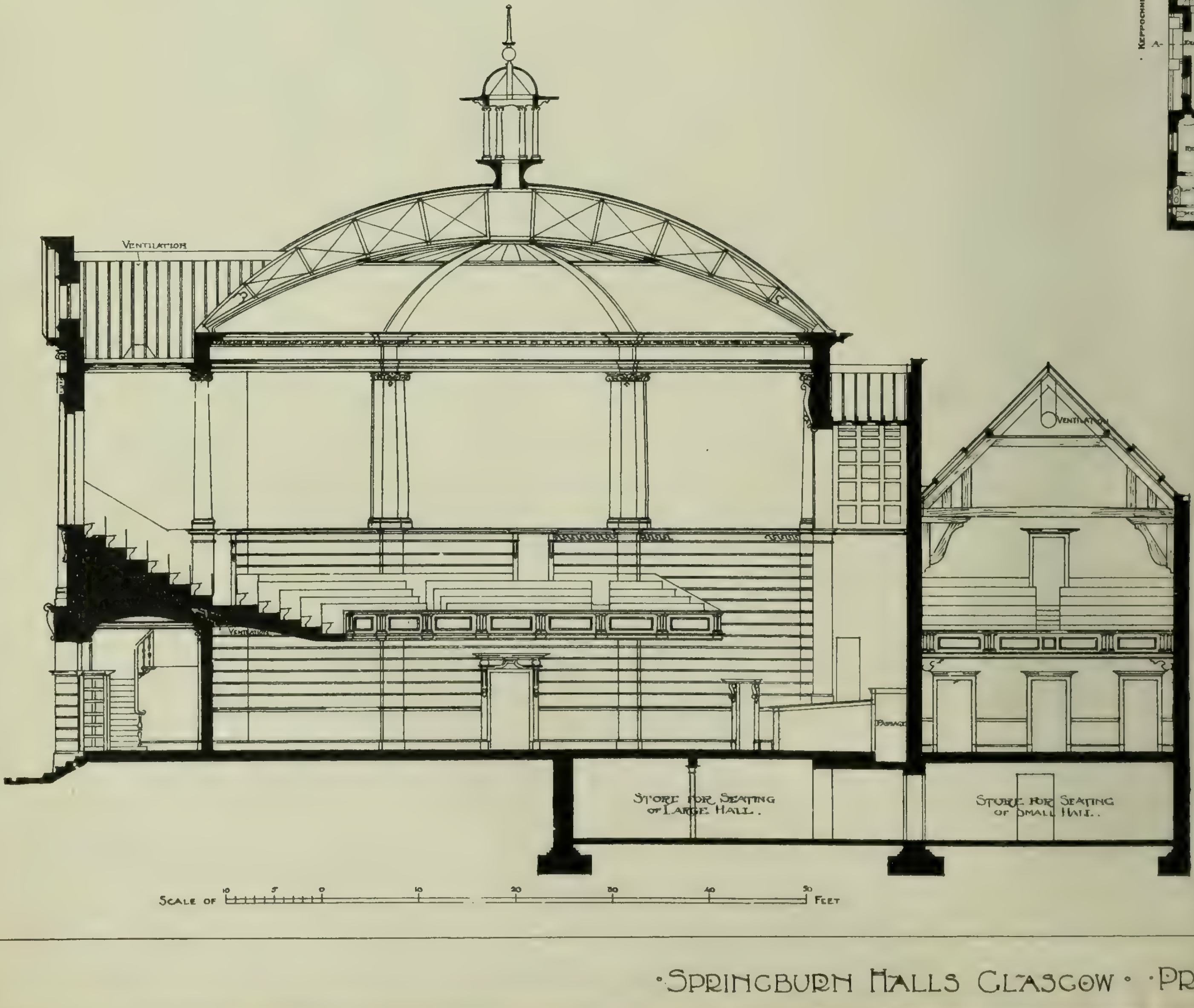
·Design Placed First· W. B. Whitie Archt

Elevation · to · Keppochhill · Road

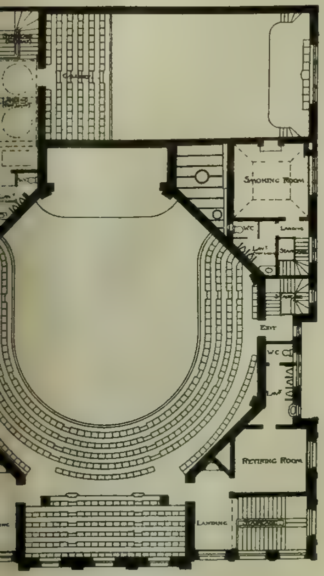
"Photo Tint" by James Akerman 6 Queen Square London W.



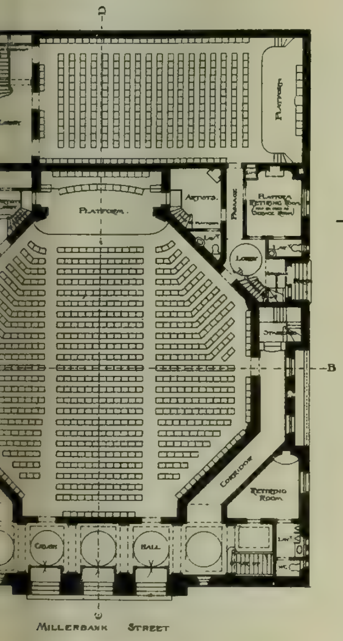



Ventilation
Ventilation
Ventilation
Passage
Store for Seating of Large Hall.
Store for Seating of Small Hall.
Scale of 10 5 0 10 20 30 40 50 Feet

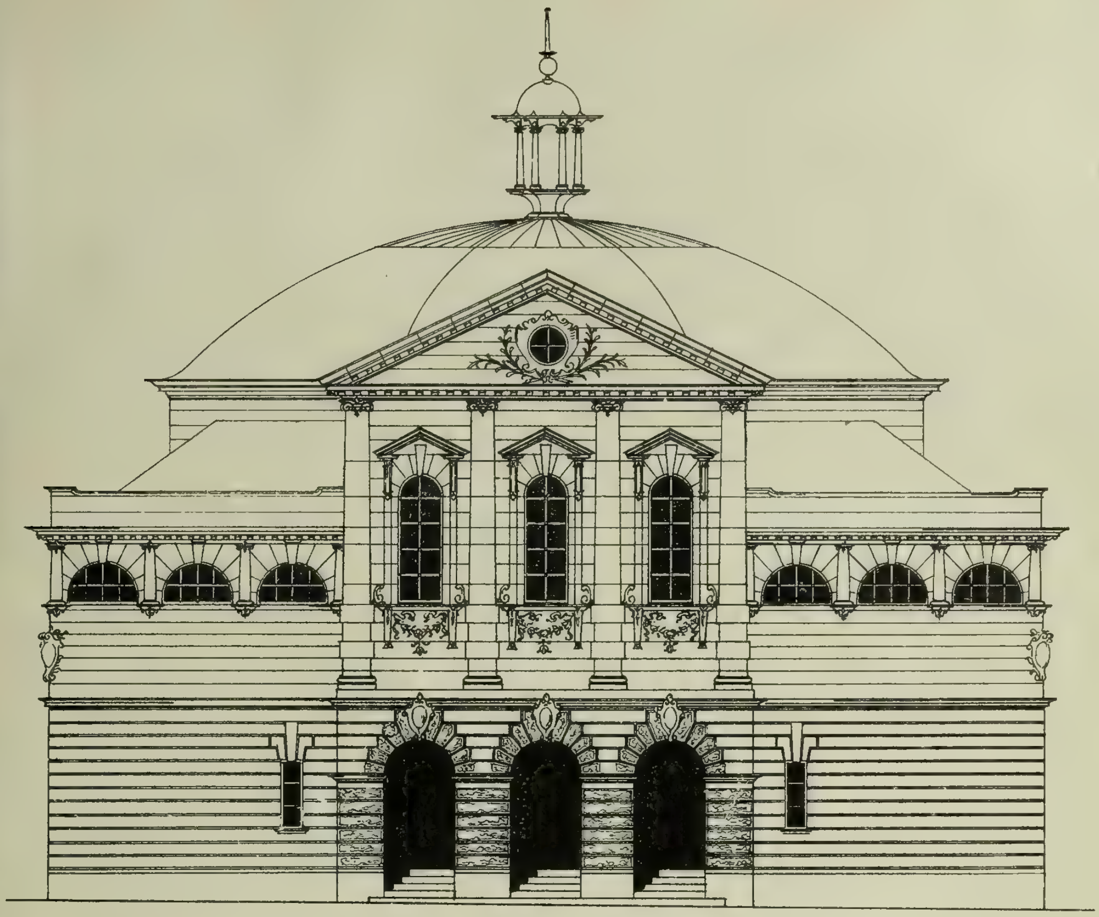
·SPRINGBURN HALLS GLASGOW· ·PRE



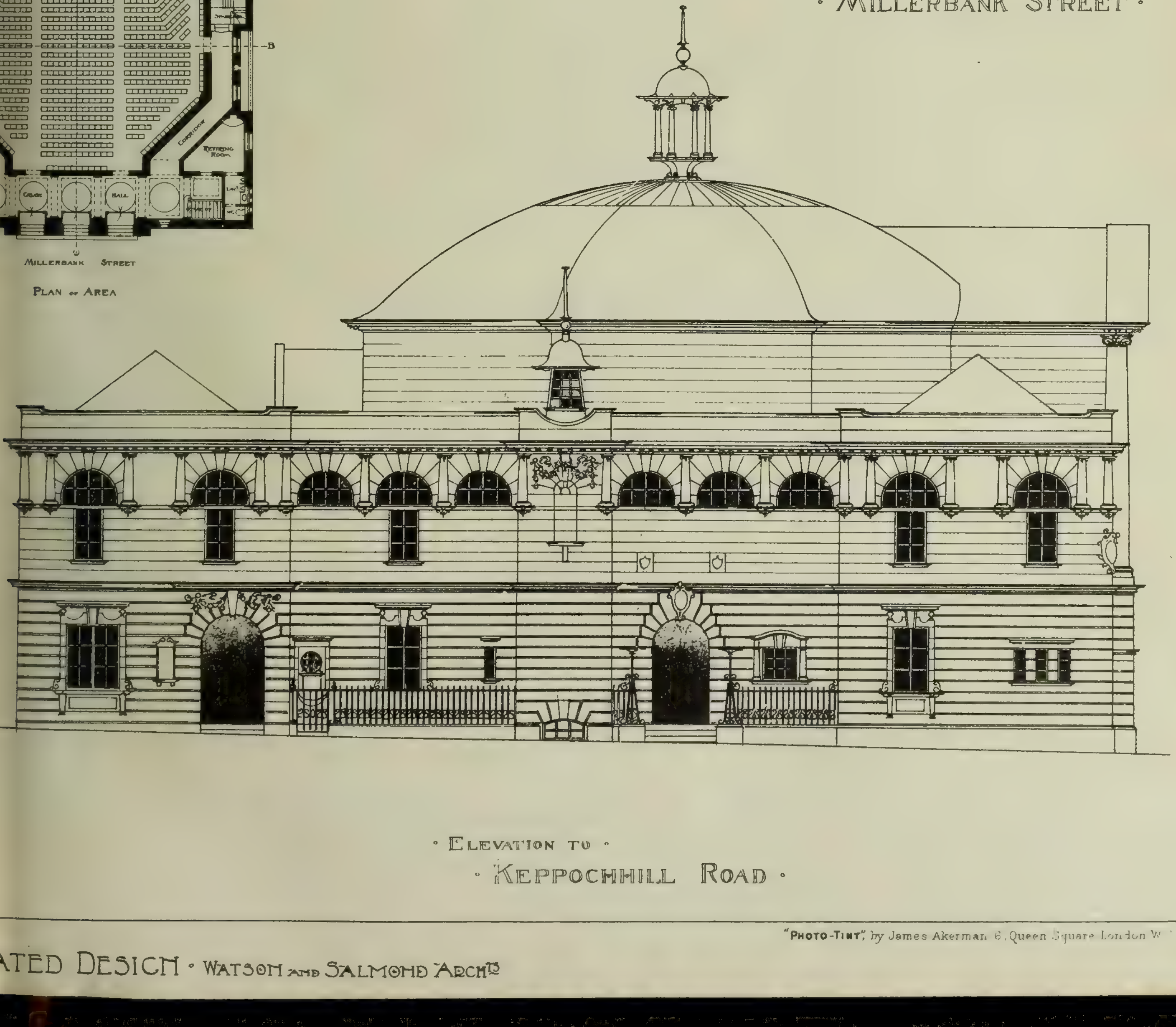
PLAN OF GALLERY



PLAN OF AREA



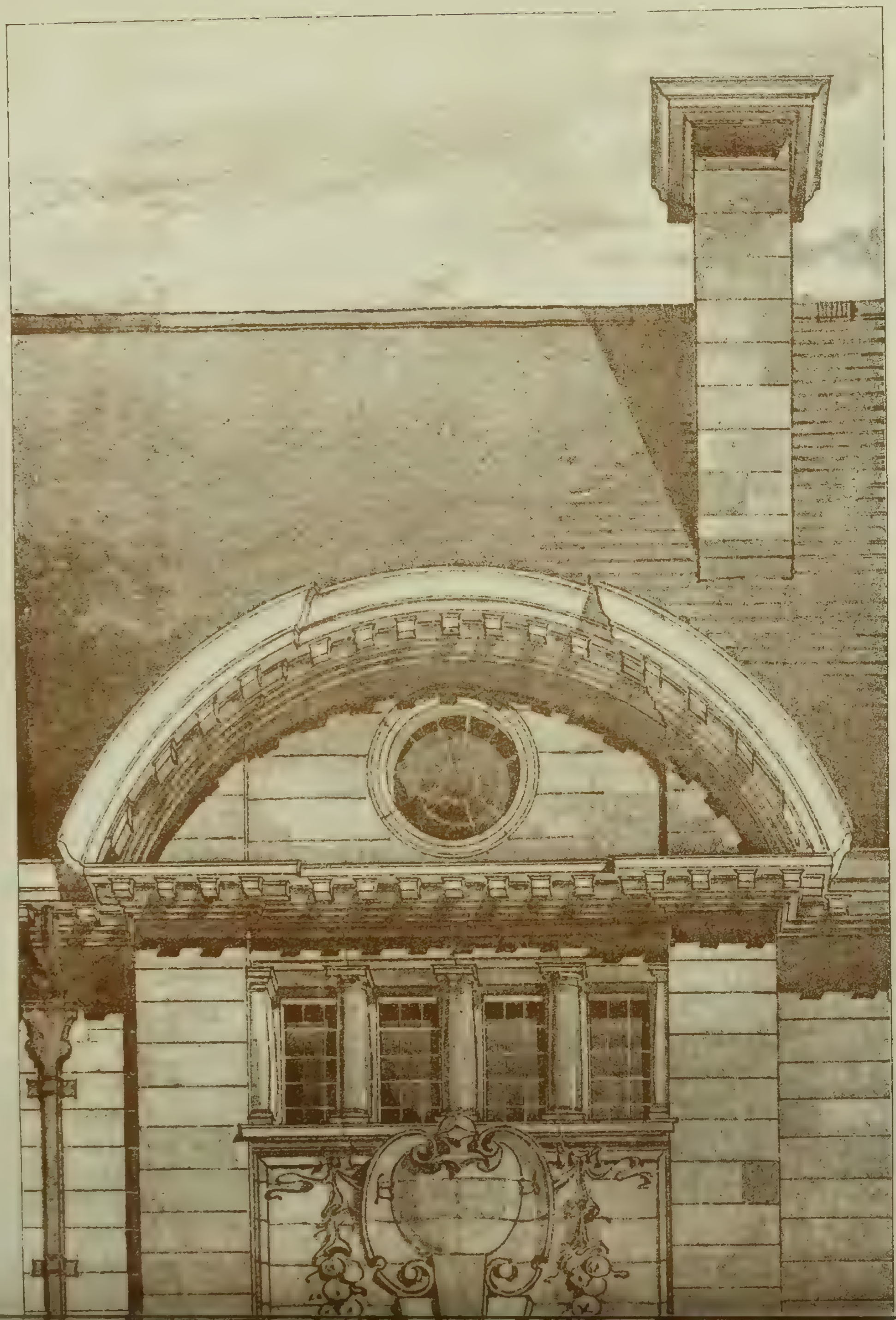
· ELEVATION TO ·
· MILLERBANK STREET ·

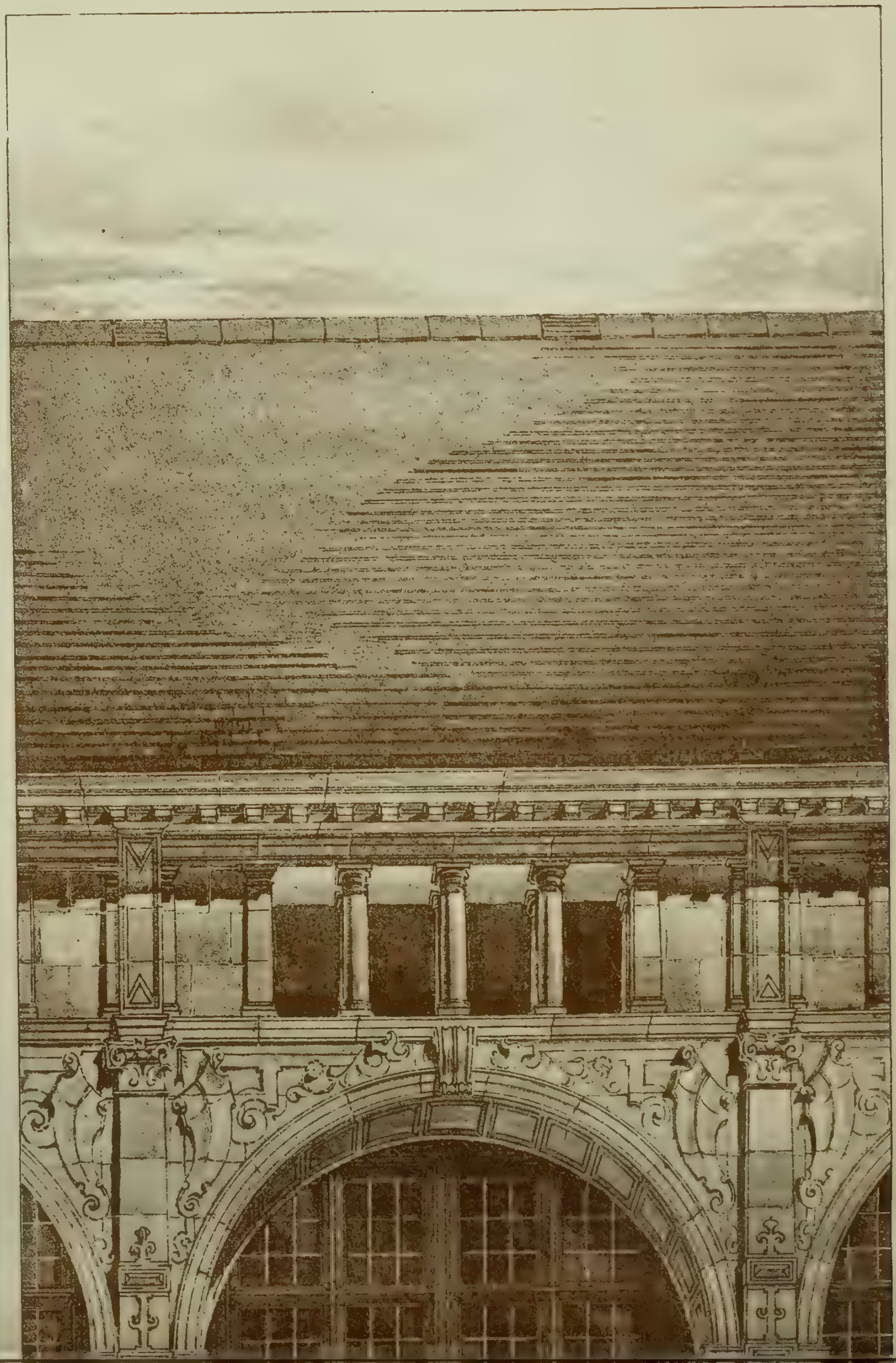


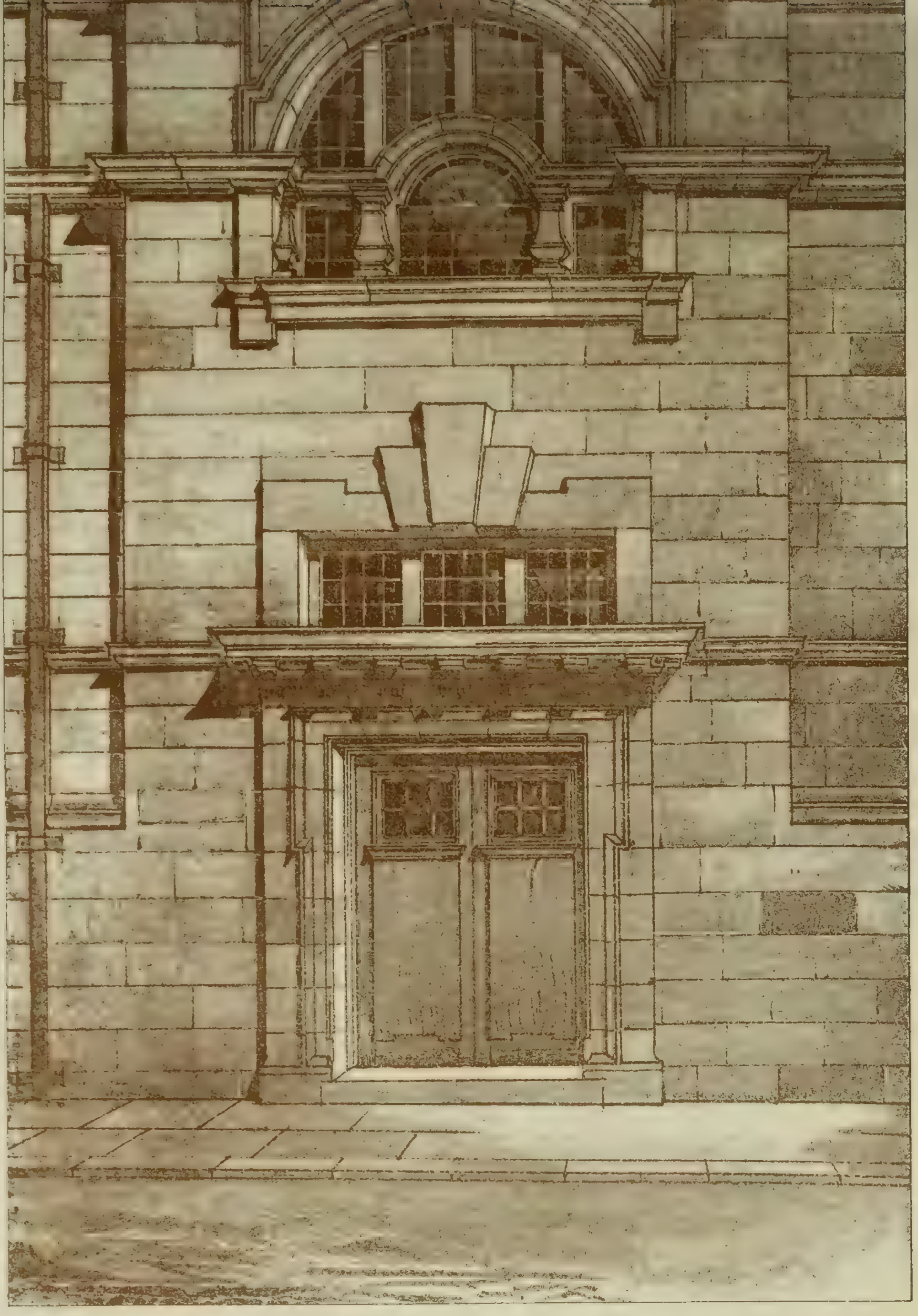
· ELEVATION TO ·
· KEPPOCHHILL ROAD ·

"PHOTO-TINT," by James Akerman, 6, Queen Square London W.C.

ATED DESIGN · WATSON AND SALMOND ARCHTS







·PART OF TECHNICAL SCHOOL, TROWBRIDGE·

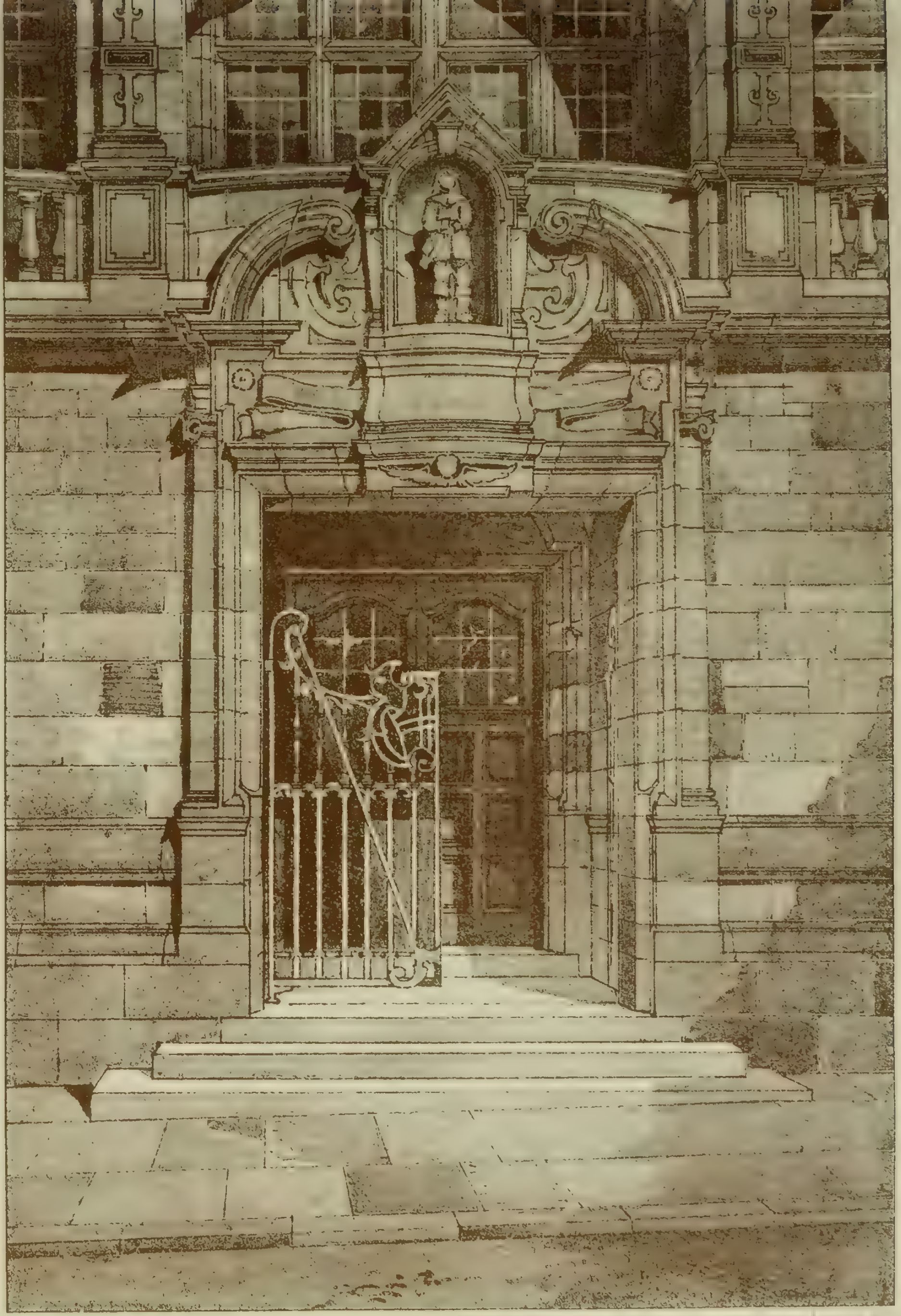
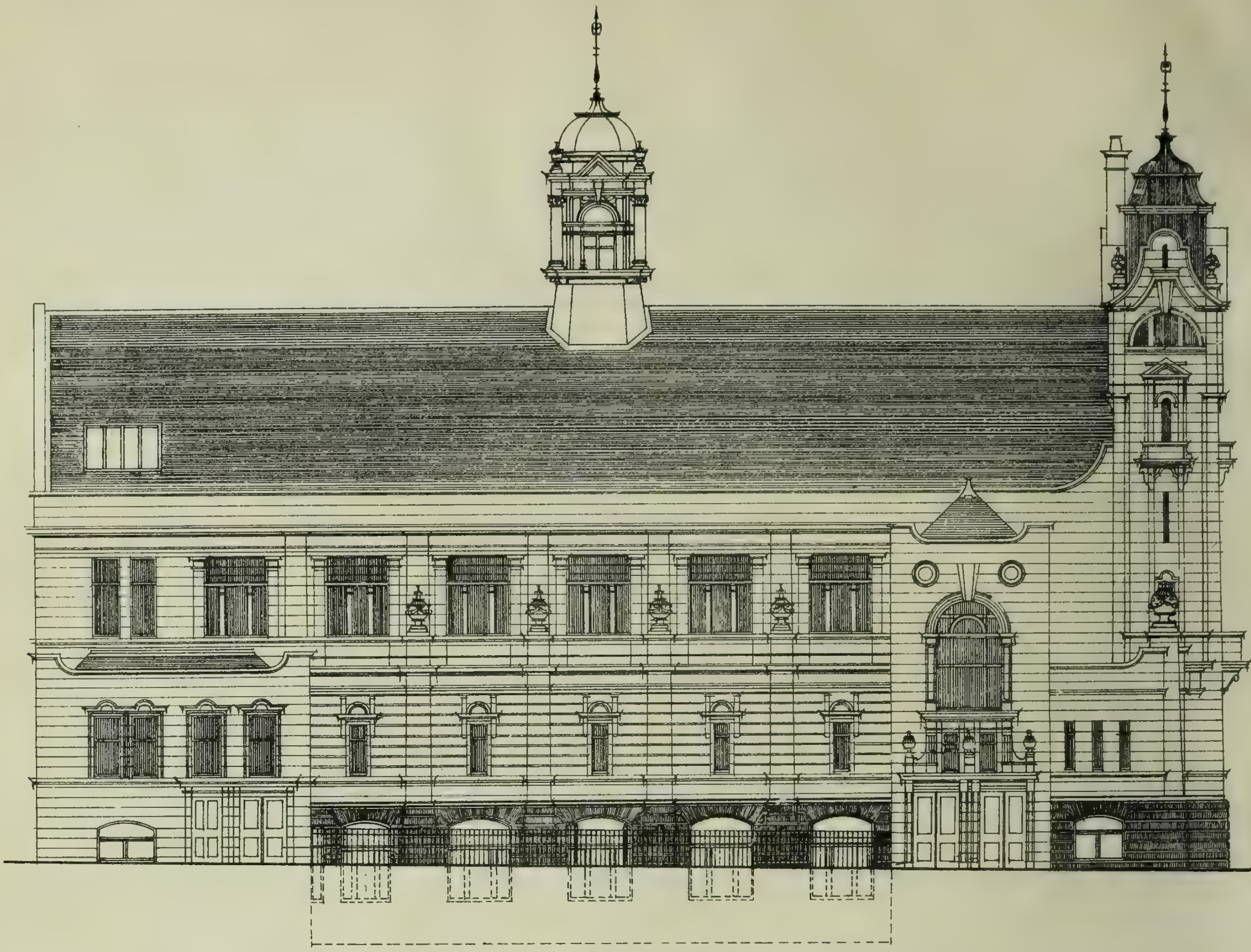


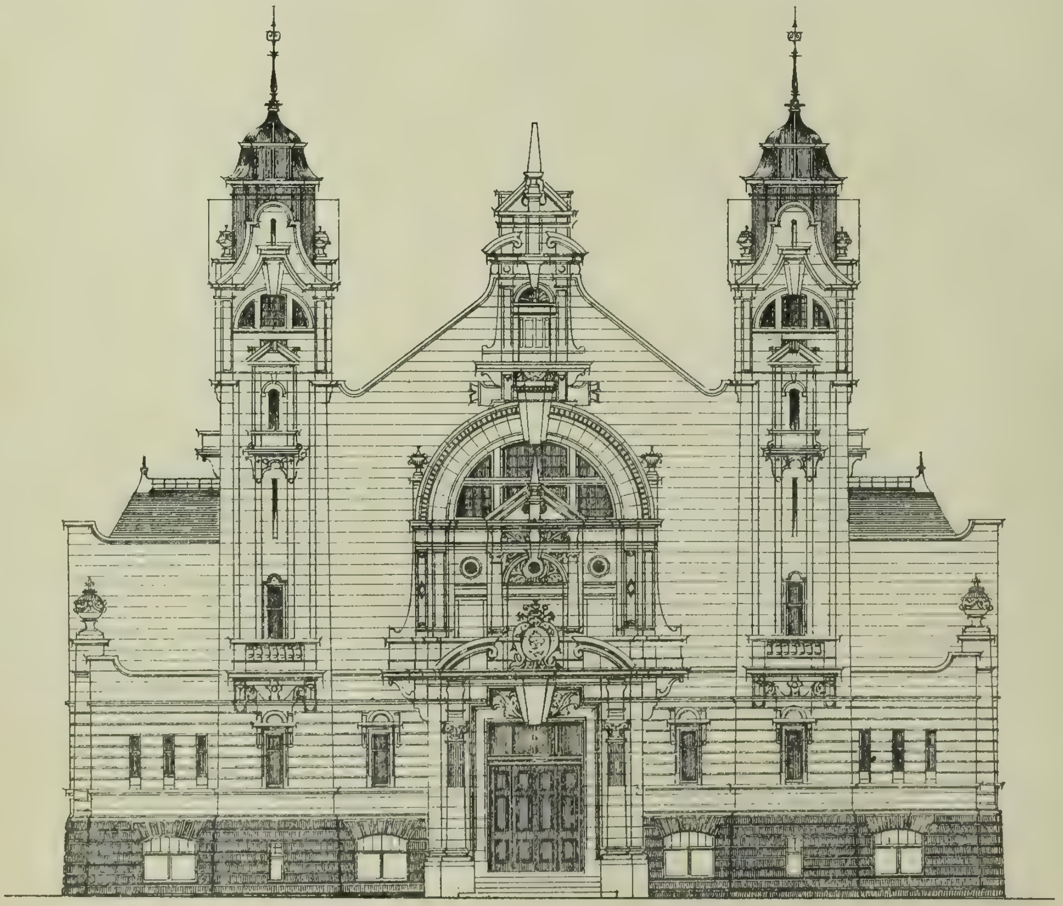
PHOTO TINT [illegible]

PART OF DESIGN FOR MUNICIPAL BUILDINGS

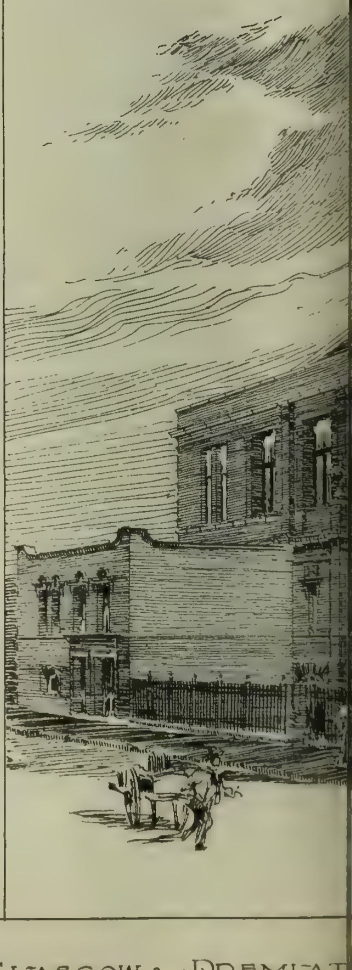
THOMAS DAVISON ARCHT



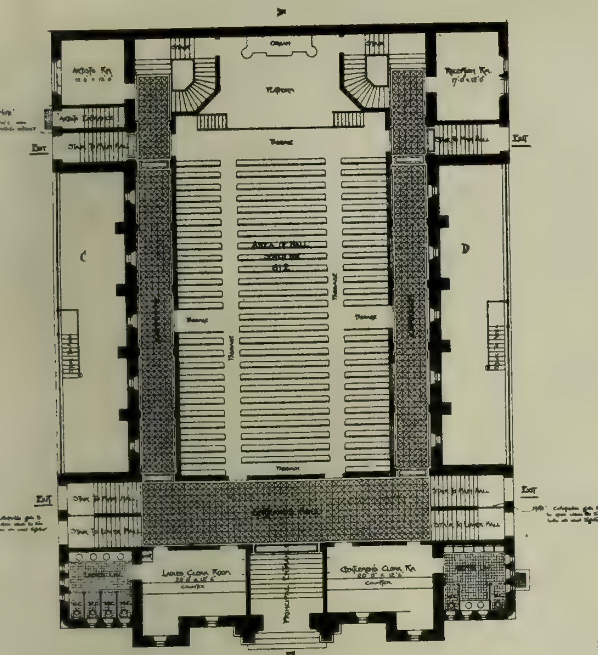
ELEVATION TO KEPPOCHHILL ROAD



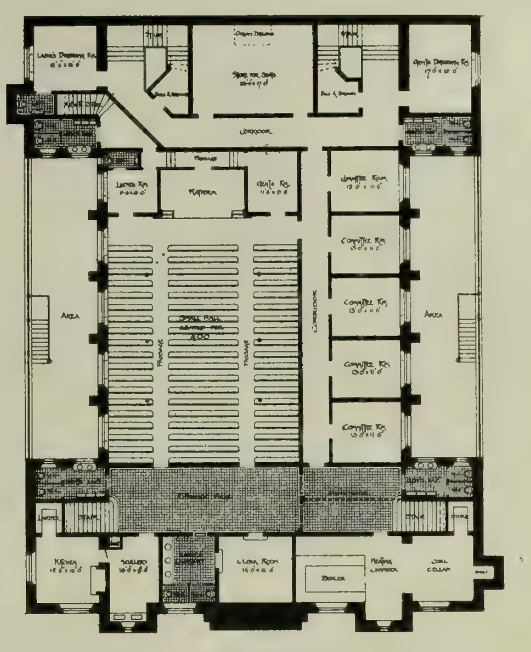
ELEVATION TO MILLARBANK ST.



·SPRINGBURN HALLS GLASGOW· ·PREMIAT


ORGAN
PLATFORM
ARTISTS RM. 12'6" x 12'0"
RECEPTION RM. 17'0" x 12'0"
ARTISTS ENTRANCE
STAIR TO MAIN HALL
EXIT
PASSAGE
AREA OF HALL SEATED FOR 812
C
D
CORRIDOR
ENTRANCE HALL
STAIR TO LOWER HALL
LADIES CLOAK ROOM 20'6" x 12'6"
GENTLEMEN'S CLOAK RM. 20'0" x 12'6"
COUNTER
PRINCIPAL ENTRANCE

GROUND FLOOR PLAN



BASEMENT FLOOR PLAN

SCALE OF 10 5 0 10 20 30 40 50 60 70 FEET

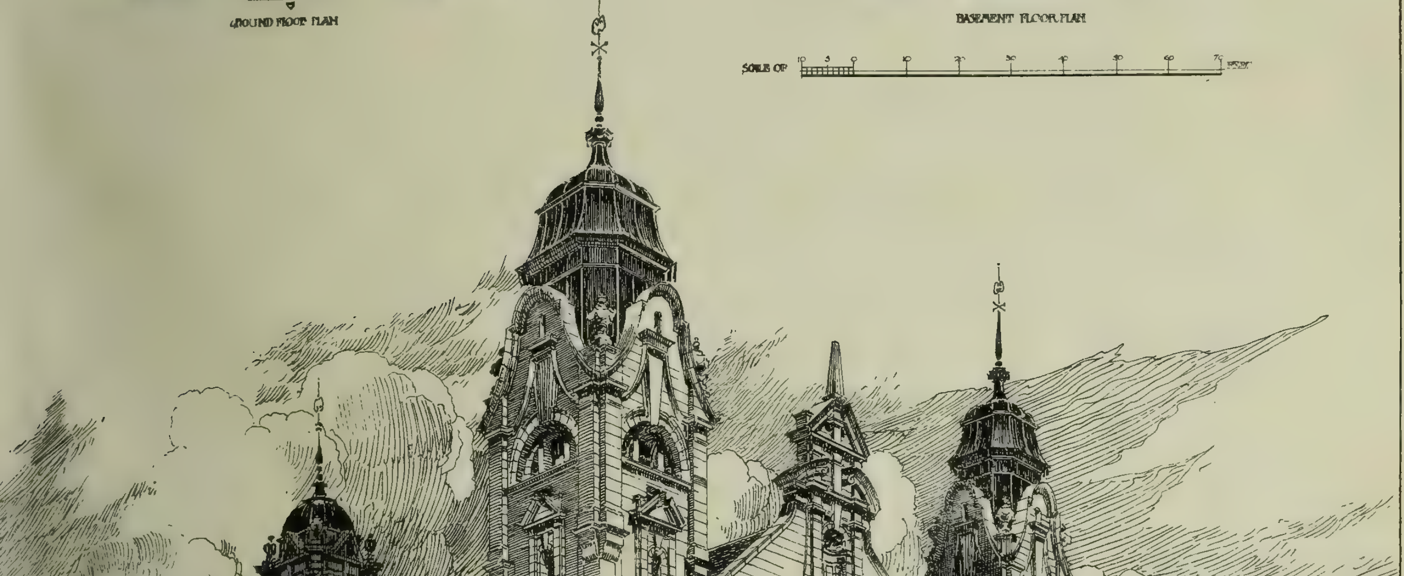


Photo-lithographed & Printed by James Akerman, 6, Queen Square W.C.

D DESIGN · J THOMSON AND R D SANDILANDS, ARCHts

STATUES, MEMORIALS, &c.

CANTERBURY.—The Benson Memorial in Canterbury Cathedral was on Saturday unveiled by the Duchess of Albany. It takes the form of an altar tomb erected against the wall of the north-west tower, close to the spot where rest the remains of Dr. Benson—the first Archbishop buried in the Cathedral since the interment of Cardinal Pole. The altar tomb is surmounted by a slab of Irish black marble on which the effigy lies under a lofty canopy. The sides are enriched with carved panels inlaid with black marble and containing three shields of enamel bearing the arms of the See and of the late Archbishop. In the pediment of the canopy is a group in high relief representing the resurrection of our Lord. The panelling at the back under the canopy is painted and gilded and bears on scrolls texts and mottoes for which directions were left by the late Archbishop. Against this background of blue and gold is outlined the sculpture in statuary marble. The Archbishop is represented clad in the Westminster cope, with pastoral staff, the hands together raised in the attitude of prayer. The monument was designed by Mr. T. G. Jackson, R.A ; Mr. T. Brock, R.A., designed the figures in the canopy ; the enamels were made by Mr. Nelson Dawson.

WATER SUPPLY AND SANITARY MATTERS.

THE WELSH WATER SUPPLY FOR BIRMINGHAM.—The members of the city council of Birmingham visited Frankley, near Rubery, to inspect the receiving reservoir and filter-beds in course of construction there to receive the impounded head waters of the Elam and Claerwen. The visitors were received by Mr. Ernest Mansergh, and by Mr. F. W. Macaulay, resident engineer at Frankley. Work was commenced upon the reservoir nearly two years ago, and the contract is to be finished in three years from the present time. The site slopes towards Selly Oak, and is traversed by a small watercourse known as Merritt's Brook. Upon the higher portion there is being scooped out of the red marl a semicircular space. The excavation involves the removal of about 750,000 cubic yards of soil. The bank, already raised to about half its height, is concrete, backed with earth, and rising about 35ft. above the general level. A concrete wall of similar height will divide the reservoir into two, while each division will be further subdivided by a dwarf wall, so that any subdivision may be emptied for cleansing. The entire floor of the reservoir is to be covered with concrete, with a layer of asphalte to secure complete imperviousness, while the whole of the sides will have upon the asphalte a lining of blue brick in cement. The reservoir will have a water area of about 25 acres, and a depth of from 30ft. to 35ft., its capacity being 200 million gallons, or about ten days' supply at the rate of 20 million gallons a day. The reservoir provides this storage as a precaution against any accident upon the aqueduct, and the water will be improved by a short period of rest before passing on to the filter-beds. About 600 men are employed on the undertaking, and the contractor is Mr. Abram Kellett, of Ealing.

King's College Hospital, Portugal-street, W.C., will be closed for two months from to-day (Friday), that the whole of the wards may be refloored and fitted with electric light.

Wesley's Chapel in the City-road was reopened with much ceremony on Friday last, after renovation, effected at a total cost of £4,000. At a cost of £2,450 new buildings have been erected near the chapel, containing reception-rooms, retiring-rooms, and cloak-rooms ; £1,057 has been spent on internal decoration ; the front has been pointed down and cleaned, and the portico, with its six medallions bearing the dove and olive-branch, has been cleansed. Messrs. Gordon, Lowther, and Gunton, of Blomfield-street, E.C., were the architects.

The shareholders of the Great Eastern Railway Company, at a special meeting have unanimously given their approval to a Bill now before Parliament authorising the London, Walthamstow, and Epping Forest Railway Company "to construct a new railway to connect with the Great Eastern Railway and to abandon a portion of their authorised railway." The projected line, which will be 13¾ miles in length, will run from South-place, Finsbury, to High Beech, Epping Forest, and will have junctions with the Great Eastern Railway Company near Tottenham and Clapton, so as to enable trains from Palace Gates, Enfield, Walthamstow, Hertford, and the Cambridge main line to run to South-place. It will also have a junction near Hoe-street, which will admit of Great Eastern trains running between Liverpool-street, Fenchurch-street, and Stratford to have access to High Beech ; and Great Eastern trains will be able to run to Chingford from South-place. The junction at Tottenham will also give access to South-place off the Tottenham and Hampstead line.

MEETINGS FOR THE ENSUING WEEK.

SATURDAY (TO-MORROW). — Architectural Association. Visit to Græme's Dyke, near Harrow Weald (R. Norman Shaw, R.A., architect). Train leaves Euston 2.20 p.m.

Trade News.

WAGES MOVEMENTS.

BUILDING TRADE DISPUTE. — The conference which the National Federation of Building Employers proposed to hold with the representatives of the Plasterers' Union has been postponed. At Manchester last week the masters suggested that the meeting should take place on Wednesday in this week in London, but Mr. J. A. S. Hassal, the masters' secretary, received a letter from Mr. N. Dellar, stating that he had been unable to arrange the attendance of representatives of his society without consulting his executive council. The masters are pledged to the consideration of the question of a national lock-out should the proposed conference not take place, or, if arranged, the proceedings should prove futile.

GALASHIELS.—The journeymen gasfitters and plumbers are to have an advance in their wages from 7½d. to 8d. per hour. The rise will come into effect on October 2.

NEWCASTLE-ON-TYNE.—At a meeting of joiners on strike held at the Central Hall, Newcastle, on Saturday, it was announced that two firms had signified their intention to grant the advance of wages asked, and this caused 70 men to be at their old employment on Monday.

New schools are being erected at Long Eaton, Notts, from the designs of Mr. A. Wills, architect, Derby, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

Arising out of the Local Government Board's provisional order for street improvements, an inquiry took place at the Royal Hotel, Bristol, on Tuesday, in respect of a claim of £3,000 compensation for premises in Bragg's-lane.

The funeral service of the late Professor Banister Fletcher, who, as we mentioned last week, died on the 5th inst., took place at noon on Monday at St. Mary's Church, Abbey-road, Kilburn, N.W., and the interment at Hampstead Cemetery.

A feature in the business of last week at the London Auction Mart was the demand for land, both building and agricultural. In regard to land of the latter character, a great improvement in value has come about, particularly in respect to land in Essex ; what could have been bought for £5 per acre a few years ago is now fetching from £12 to as high as £80. Building land in the Metropolitan portion of the same county also sold well, some inclosures at Walthamstow being disposed of at from £215 to £240 per acre. Small class investments met with a ready sale. The week's total amounted to £298,627, which is £7,600 in excess of last year's figures.

Messrs. Wm. Potts and Sons, clock manufacturers of Guildford-street, Leeds, and Town Hall Buildings, Newcastle-on-Tyne, have just erected at the Darlington Town Hall, Co. Durham, four new skeleton cast-iron dials, 7ft. each in diameter, filled with the white opal glass for illumination in the tower of the town-hall, Darlington, for the mayor and corporation, and to the orders of the borough surveyor and engineer, Mr. T. Smith ; also new quarter-chimes and bell to Spennymoor Church, near Durham, to the memory of Mrs. Duncombe Shafts ; and a new illuminated clock at the Yorkshire Penny Bank, Middlesbrough ; and illuminated clock, with two dials, at Dewsbury-road, Leeds.

Mr. Robert Tretheway, for over forty years past the superintendent of Messrs. Luke's china, clay, and stone works at Goonamaris, near St. Dennis, Cornwall, died very suddenly on Thursday in last week.

Mr. Daniel Brady, late of 52, Queen's-walk, Nottingham, a builder 76 years of age, shot himself through the temples while walking by the Trent side on Tuesday in last week. At the inquest a verdict of suicide whilst of unsound mind was returned.

Raphael House, Moorfields, erected by Messrs. Raphael Tuck and Sons, was opened on the 6th inst. The premises have a frontage to Moorfields of 96ft., to Tenter-street of 74ft., and to White-street of 137ft. Portland stone and red brick have been employed. A feature of the interior is the marble dado of Verde Antico, from the recently rediscovered quarries near Volo, Greece, which adorns the grand staircase. A passenger-lift is also provided as means of access to the five upper floors. Mr. W. Hilton Nash was the architect, and Messrs. Patman and Fotheringham were the builders.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	7 5 0	,,	8 5 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£10 15 0	...	£11 0 0
Best ditto	11 5 0	...	11 10 0

	Per ton.		Per ton.
Cast-Iron Columns	£6 10 0	to	£9 0 0
Cast-Iron Stanchions	6 10 0	,,	9 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	11 10 0	,,	12 10 0
Cast-Iron Sash Weights	4 12 6	,,	4 15 6
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 7 6	to	£6 12 6
4in. to 6in.	6 2 6	,,	6 7 6
7in. to 24in. (all sizes)	5 12 6	,,	5 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	15 2 6	,,	16 2 6
Pig Lead, in 1cwt. pigs	15 7 6	,,	16 7 6
Lead Shot, in 28lb. bags	19 0 0	,,	20 0 0
Copper Sheets, sheathing and rods	83 0 0	,,	84 0 0
Copper, British Cake and Ingot	79 15 0	,,	80 5 0
Tin, Straits	125 0 0	,,	126 0 0
Do., English Ingots	127 0 0	,,	128 0 0
Spelter, Silesian	25 12 6	,,	26 2 6

TIMBER.

Teak, Burmah	per load	£13 5 0	to	£16 5 0
,, Bangkok	,,	11 5 0	,,	15 5 0
Quebec Pine, yellow	,,	4 7 6	,,	6 10 0
,, Oak	,,	4 10 0	,,	6 5 0
,, Birch	,,	2 5 0	,,	3 0 0
,, Elm	,,	3 17 6	,,	4 17 6
,, Ash	,,	3 2 6	,,	4 7 6
Dantsic and Memel Oak	,,	3 5 0	,,	4 0 0
Fir	,,	1 10 0	,,	3 10 0
Wainscot, Riga p. log	,,	3 15 0	,,	6 5 0
Lath, Dantsic, p.f.	,,	4 10 0	,,	5 10 0
St. Petersburg	,,	4 0 0	,,	6 10 0
Greenheart	,,	7 15 0	,,	8 0 0
Box	,,	4 0 0	,,	15 0 0
Sequoia, U.S.A	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5	,,	0 0 7½
,, Honduras	,,	0 0 4½	,,	0 0 6
,, Mexican	,,	0 0 3½	,,	0 0 4
,, African	,,	0 0 3½	,,	0 0 5
Cedar, Cuba	,,	0 0 4	,,	0 0 4½
,, Honduras	,,	0 0 3¾	,,	0 0 4½
Satinwood	,,	0 0 10	,,	0 1 9
Walnut, Italian	,,	0 0 3	,,	0 0 7½

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£19 0 0	to	£25 10 0
,, 2nd	14 0 0	,,	17 5 0
,, 3rd	6 5 0	,,	10 5 0
Canada Spruce, 1st	8 5 0	,,	10 5 0
,, 2nd and 3rd	7 0 0	,,	8 5 0
New Brunswick	7 0 0	,,	7 15 0
Riga	8 5 0	,,	9 5 0
St. Petersburg	10 0 0	,,	14 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 15 0	,,	10 10 0
White Sea	11 0 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 11 6	,,	£0 14 9
2nd ditto	0 10 0	,,	0 10 9
Other qualities	0 5 3	,,	0 6 6
Staves, per standard M :—			
Quebec pipe	—		—
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per ton.	£20 15 0	to	£21 0 0
Rapeseed, English pale	,,	23 0 0	,,	23 5 0
Do., brown	,,	21 15 0	,,	22 0 0
Cottonseed, refined	,,	16 5 0	,,	17 5 0
Olive, Spanish	,,	30 0 0	,,	32 0 0
Seal, pale	,,	18 0 0	,,	18 5 0
Cocoanut, Cochin	,,	28 5 0	,,	28 10 0
Do., Ceylon	,,	25 0 0	,,	25 5 0
Palm, Lagos	,,	24 0 0	,,	24 5 0
Oleine	,,	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 3	,,	0 7 6
Petroleum, refined	,,	0 0 6	,,	0 0 6½
Tar, Stockholm	per barrel	1 0 0	,,	1 6 6
Do., Archangel	,,	0 18 0	,,	1 0 0
Turpentine, American	per ton	28 15 0	,,	29 0 0

LIST OF COMPETITIONS OPEN.

Plumstead—Municipal Buildings and Public Library, Glossop-road (cost £40,000; E. W. Mountford, F.R.I.B.A., Assessor)	£100, £75, £50	Edward Hughes, Clerk, Vestry Hall, Maxey-road, Plumstead	July 27
Halifax—Twelve Shops, Commercial-street	£50, £25	Barstow and Midgley, Solicitors, 8, Harrison-road, Halifax	Aug. 1
Watnall Chaworth and Watnall Cantelope—Sewerage Schemes		C. J. Spencer, Clerk, Public Offices, Basford, Notts	„ 17
Kircaldy—Infectious Diseases Hospital, Fosterton Farm	No premium	Alexander Beveridge, District Clerk, Kircaldy	„ 17
Wharfedale—Isolation Hospital	£30 (merged), £15	C. V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	„ 1
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 30
Dunoon, N.B.—Sheriff Court House (£5,000) and Police Buildings (£3,500)	£30, £20	M. Sinclair, County Clerk, Lochgilphead	—
Crystal Palace—Bandstand (Assessor)	30gs., 15gs., 7gs.	W. Gardiner, Sec., Crystal Palace Co., Sydenham, S.E.	—
Beeston—Church and Sunday Schools		C. Nichols, St. John's-grove, Beeston, Notts	—

LIST OF TENDERS OPEN.

BUILDINGS.

Chequerbent - County Police Station	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	July 15
Blackwood—Repairs to English Baptist Chapel		J. Edwards, the School, Blackwood, Mon.	„ 15
Halam—Four Cottages	George Tinley	Sheppard and Harrison, Architects, 17, Kirkgate, Newark	„ 15
Clara Vale—Seven Houses	Stella Coal Co.	The Colliery Office, Clara Vale, Ryton-on-Tyne	„ 15
Northfleet, Kent—Rebuilding Edinburgh Castle		H. J. Webber, 55, Dawes-road, Fulham, S.W.	„ 15
Drumsurn—R.C. Church	Rev. E. Loughrey, P.P.	Daniel Conroy, Architect, 2, Bishop-street, Londonderry	„ 15
Merthyr Tydfil—Boiler Houses, &c., at Workhouse	Board of Guardians	E. A. Johnson, F.R.I.B.A., Abergavenny	„ 15
Bridlington Quay—Additions to 9, Midway-terrace	James Wild	Samuel Dyer, Architect, Bridlington Quay	„ 15
Llanelly—Alterations to Station Hotel		W. Griffiths, Architect, Falcon Chambers, Llanelly	„ 15
Admaston—Caretaker's Cottage at Sewerage Work	Urban District Council	Myles Morley, Surveyor, 45, Walker-street, Wellington, Salop	„ 15
Steartfield—Additions at Steartfield	W. M. G. Singer	Bridgman and Bridgman, Architects, Bank Chambers, Torquay	„ 15
Great Horton—Shops, &c.		S. Spencer, Architect, 344, Great Horton-road, Great Horton	„ 15
Dartmouth—Slaughter-House	James Coursens	E. H. Back, M.S.A., Dartmouth	„ 15
Waterside—Three Houses, Meehan's-row		Neal Carlin, Cross-street, Waterside, Ireland	„ 15
Helligan—Repairs and Additions to Farmhouse	H. H. Hooper	T. H. Andrew, Architect, 1, Trevarrick Villas, St. Austell	„ 15
Canterbury—Foundation Works, &c., at Electricity Works, Northgate-street	Lighting Committee	Henry Fielding, Town Clerk, 15, Burgate-street, Canterbury	„ 17
Banbury—Wards at Workhouse	Guardians	H. Hopkins, Architect, Southam-road, Banbury	„ 17
Dewsbury—Two Semi-Detached Houses, Savile Town		C. H. Marriott and Son, West Park-street, Dewsbury	„ 17
Cwmtynrheol - School	Llangeinor School Board	P. J. Thomas, Architect, Bridgend	„ 17
Tipton—Cart Shedding, Workhouse-lane	Urban District Council	Wm. H. Jukes, Surveyor, Public Offices, Owen-street, Tipton	„ 17
Bristol—Relief Depot, Mill-lane	Guardians	W. S. Skinner, Architect, Baldwin-street, Bristol	„ 17
Newark—Pair of Residences, Boundary-road		Saunders and Saunders, Architects, Arcade Chambers, Newark	„ 17
Beckenham—Electric Light Station	Urban District Council	John A. Angell, Engineer, Beckenham	„ 17
Rowley Regis—Extension of Offices, Lawrence-lane	Urban District Council	Meredith & Pritchard, Architects, Bank Buildings, Kidderminster	„ 17
Cymmau—Alterations at C M Chapel		William Lewis, Cymmau	„ 17
Old Trafford—Six-Stalled Stable	Stretford Urban District Council	John Bowden, Architect, 14, Ridgefield, Manchester	„ 17
Wimbledon—Public Baths, Latimer-road	Urban District Council	R. J. Thomson, A.R.I.B.A., 47, Hill-road, Wimbledon	„ 17
Alnwick—Alterations to Property in Market-place	C. E. Purvis	W. Robson Hindmarsh, jun., Architect, Alnwick	„ 17
Fishguard—House, High-street		Capt. James Thomas, Kensington-street, Fishguard	„ 17
Leeds—Alteration to Shop and Office, Lands-lane	Charles Appleton	Thomas Winn, Architect, 92, Albion-street, Leeds	„ 17
Barnoldswick—Isolation Hospital	Urban District Council	W. Bennett, Surveyor, Council Offices, Barnoldswick	„ 17
Pellon—Foundry		T. H. Tyson, Architect, Fountain-street, Halifax	„ 17
Castleford—Residence, Pontefract-road	S. Sidwell	Arthur Hartley, Architect, Carlton Chambers, Castleford	„ 17
Stamford—Workhouse	Guardians	J. H. Morton, F.R.I.B.A., Architect, 50, King-st., South Shields	„ 17
Camborne—Two Shops and Houses, Trelowarren-street		J. Bond, Outfitter, 100, Trelowarren-street, Camborne	„ 17
Old Hill—Extension of Offices	Rowley Regis U.D.C.	Meredith and Pritchard, Architects, Bank Buildings, Kidderminster	„ 17
Bolton-on-Dearne—Police Station	West Riding County Council	J. Vickers Edwards, County Surveyor, Wakefield	„ 17
Warrington—Electric Light Station and Central Sanitary Depot at Wharf Meadows	Electric Lighting Committee	James Deas, C.E., M.I.M.E., Municipal Offices, Warrington	„ 18
Dewsbury—Fletcher Homes	Corporation	F. W. Ridgway, Architect, Bond-street, Dewsbury	„ 18
Bridlington Quay—Additions to 7, Prospect-street	J. A. Andrew	J. Earnshaw, Architect, Wellington-road, Bridlington Quay	„ 18
Wargrave—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 18
Dover—Additions to Car-Shed	Town Council	Henry E. Stilgoe, Borough Engineer, Town Hall, Dover	„ 18
Newstead, Halifax—Nineteen Houses		T. H. Tyson, Architect, Fountain-street, Halifax	„ 18
Dorchester—Alterations and Additions to Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 18
Lowestoft—Electric Light Station	Corporation	A. E. Pridmore, Architect, 2, Broad-street Buildings, E.C.	„ 18
Tredegar—Colliers' Cottages (150) at McLaren Colliery	Iron and Coal Company	The Secretary, 7, Fenchurch-avenue, E.C.	„ 18
Aberdare—Alterations to Cwmbach Co-operative Stores		Evan Jones, 2, Pitt-street, Aberaman	„ 18
Dundee—Fire Station	Town Council	W. Mackison, F.R.I.B.A., 91, Commercial-street, Dundee	„ 18
Wallsend—Seven Houses	Industrial Co-operative Society	The Secretary, Carville-road, Wallsend	„ 18
Abercrave—Board School (300)	Ystradgynlais Lower School Board	Philip Williams, Ty'r Gorof, Ystradgynlais	„ 18
Keighley—Three Houses		Wm. Rhodes Nunns, Architect, Market-street, Bingley	„ 18
Dewsbury—Twenty-Seven Houses, Salter-square Estate	Pioneers' Indus. Soc.	Holtom and Fox, Architects, Westgate, Dewsbury	„ 18
Westbury—Stable at Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 18
Merthyr Tydfil—Shops, &c.	Howfield and Sons	C. M. Davies, 112, High-street, Merthyr Tydfil	„ 19
Wakefield—Four Houses		Willie Wrigley, Architect, 6, Westgate, Wakefield	„ 19
Fareham—Steam Laundry	Steam Laundry Co.	W. Cobbett, A. M.I.C.E., West-street, Fareham, Hants	„ 19
Walsall—Depot, Wolverhampton-street	Corporation	John R. Cooper, Town Clerk, Walsall	„ 19
Drogheda—Repairs to Labourer's Cottages at Killally, Clonmore, and Kearneystown	Rural District Council	T. Turley, Architect, Drogheda	„ 20
Swindon—Additions to 1, Commercial-road	Permanent Building Society	W. H. Read, M.S.A., Corn Exchange, Swindon	„ 20
Bridlington Quay—Detached Residence, Cardigan-road		J. Earnshaw, Architect, Carlton House, Bridlington Quay	„ 20
Stairfoot—Box Factory	Rylands' Glass and Engineering Co.	Joseph Firth and Sons, Architects, 67, Vulcan-road, Dewsbury	„ 20
Irchester—Additions to Wesleyan Chapel and School		N. H. Boney, Architect, 124, Chancery-lane, London, W.C.	„ 20
Folkestone—New Wing to Victoria Hospital	Committee	H. Percy Adams, F.R.I.B.A., 28, Woburn-pl., Russell-square, W.C.	„ 20
Surfleet—Partial Restoration of Church		The Vicar, Surfleet, Spalding	„ 20
Manchester—Alterations at Abattoirs, Water-street	Corporation	The City Surveyor's Office, Town Hall, Manchester	„ 20
Standon—Cottage Hospital		George A. Craig, Architect, Market Drayton	„ 20
Earlsheaton—Infectious Diseases Hospital	Dewsbury Joint Hospital Board	Holtom and Fox, Architects, Westgate, Dewsbury	„ 20
Burton Dassett—Master's Residence at North End	School Board	Francis P. Trespess, Architect, 8, Jury-street, Warwick	„ 21
Sutton Coldfield—Depot, Riland-road	Corporation	W. A. H. Clarry, Borough Engineer, Town Hall, Sutton Coldfield	„ 21
Wolverhampton—Pupil Teachers' Centre	School Board	T. H. Fleming, Architect, 102, Darlington-street, Wolverhampton	„ 21
Downpatrick—Slating Porch, &c.	Guardians	J. W. Montgomery, Clerk, Board-room, Downpatrick	„ 21
Leeds—Brewhouse at Alfred House Inn	B. R. Child	A. E. Dixon, Architect, 5, Park-lane, Leeds	„ 21
Carlisle—Enlargement of Head Post Office	Commissioners of H.M. Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	„ 21
Bella Vista—Detached Villa, Park-street		Edwin Foster, Architect, Bella Vista	„ 22
St. Ewe—Schools, &c.	School Board	Walter Giles, Architect, South House, St. Austell	„ 22
Beccles—Engine-House, &c., Castle Flour Mills		N. W. Pells, Beccles	„ 22
Tredegar—Additions to Primitive Methodist Chapel		Rev. J. Turner, 1, Rawlinson-terrace, Tredegar	„ 22
Boarden Barn Hill—Villa, &c.	J. Sanson	Procter Sherwin, Architect, Manchester-street, Boarden	„ 22
Robin Hood's Bay—Additions to Police Station		Walker Stead, M.I.C.E., County Surveyor, Northallerton	„ 22
Winchester—Additions to High School for Girls, North Walls		Thos. Stopher, F.S.I., Architect, 57, High-street, Winchester	„ 22
Dartmouth - Cart-Shed	Corporation	T. O. Veale, Surveyor, Dartmouth	„ 24
Croydon—Cowsheds, Beddington-lane	Town Council	R. M. Chart and Son, Architects, Katharine-street, Croydon	„ 24
Mynyddislynn—Additions to Schools	School Board	R. L. Roberts, Architect, Abercarn	„ 24
Dartford—Technical Schools	Urban District Council	G. H. Tait, M.I.C.E., Architect, Lowfield-street, Dartford	„ 24
Glasgow - Tenements in Stobcross, Clyde, and Piccadilly Streets	Corporation	The City Engineer, 64, Cochrane-street, Glasgow	„ 24
Hastings—School, St. Helens	School Board	Arthur Wells, F.R.I.B.A., Queen's Chambers, Hastings	„ 25
Whitechapel, E.—Enlargement of Fire Station	London County Council	The Architect's Department, County Hall, Spring Gardens, S.W.	„ 25
Catford, S.E.—Enlargement of Town Hall	Lewisham Board of Works	The Surveyor's Department, Lewisham Town Hall, Catford, S.E.	„ 25
Hucclecote—Schools	School Board	W. B. Wood, Architect, 14, Queen-street, Gloucester	„ 25
Exmouth—Detached Villa, Cyprus-road	Capt. Arthur	Philip Kerley, Architect, Exmouth	„ 25
Oxford—Girls' Central School, New Inn Hill	School Board	F. P. Morrell, Clerk, 1, St. Giles, Oxford	„ 25
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	„ 26
Grimsby—Goods Warehouse and Office	Great Central Railway Co.	The Engineer's Office, London-road Station, Manchester	„ 26

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TECHNIC AND ÆSTHETIC QUALIFICATIONS.

TWO kinds of architectural teaching beset the student. He is confronted on one side by the technist, who is ready to cram him with all kinds of technical knowledge relating to the properties and conversion of building materials, the use of tools, and workshop practice; while, on the other side, the art instructor is equally zealous to instil into his mind ideals of design, historical phases of the art of architecture, theories of colour and decoration. Which of these two apostles is he to follow? Each of them looks only on one side of the shield, and thinks his scheme of instruction complete without the other. To one class of students there is a prejudice for the mechanical side of building; they take an interest in all mechanical and ingenious problems, and they naturally incline to the technical branch. To a student of this kind, measurement, weight, and mechanical execution has an attraction, and the superintendence of buildings is naturally more to his liking than studying on paper the effects of different arrangements of composition and detail from an artistic point of view. The draughtsman and designer studies building from a totally different standpoint. He looks at the subject as a whole synthetically; mechanical details of workmanship are not his *forte*—a reason why so few draughtsmen can look at details with the eye of a practical man, and why so few become clerks of works.

This diversity of taste is bewildering if not distracting to the ordinary student who is entering the profession; he finds the schools putting forth both claims for his allegiance, the literature he studies is equally divided and equally distinct in their teaching; one class of books put into his hands or recommended deals exclusively with building materials, with trades, with mathematical principles, with processes of manufacture; he finds nothing in such guides that will give him any information as to the design of structures, whether of stone, brick, wood, or iron. They teach plenty about weights and stresses, and how to calculate them under given, often very ideal, conditions, but absolutely nothing as to their application to buildings of the simplest kind. The tables and formulæ and diagrams appear seldom to apply to actual building problems. The reason of this is because the authors or compilers of our treatises on construction are either pure and simple "book-makers," or are men who have had only one kind of training—generally teachers of mathematics or engineers, who devote their time to writing such books. We want mathematics and construction, if possible, treated from an architect's or builder's point of view, a necessity we seem to be unable to satisfy in these days of independent study and specialism, because the architect's education has been deficient in such matters. Nor is the student better off when he tries to obtain practical instruction from works on architecture or art. He finds no information about plan, about details of construction, and how such-and-such a design is executed. If it is the design of an iron structure it is drawn to a small scale, and the details are shirked or left to the imagination, while elaborate drawings are published of brick and stone buildings without the slightest information as to how the bond is worked or the stone cut and jointed. Volumes of elaborate interior decorations or historic buildings are brought out that give no working sections or explain the material or composition of the ornamental details. The elementary treatises are often mere compilations of older books by well-known authors. If it is a work on carpentry, the author is content to repeat the examples of roofs which Tredgold published early in the century: they are all common king-post or queen-post trusses; no examples of Mediæval roof-framing are furnished. Should our architect want to see how a flêche or a timber cupola is constructed, he has to wade through volumes of the "B. N." for details of such work; there is nothing to be found in the ordinary treatise or textbook. Stonework, terracotta, brick, and iron details have all been published in profusion, but only as architectural sketches or scraps of mouldings and the like, without any attempt to give sections to show the jointing or the construction. In this manner we have theoretical treatises that ignore actual construction or application to modern work, books and compilations on the trades, which repeat old examples, and art and architectural works which leave the student in the dark as to the modes of construction adopted.

To a certain extent the Technical and Art Schools supply the deficiencies, but not in the best form, or at the right moment. In the technical class room the instructor is not likely to interrupt his demonstration by showing how certain applications can be made to different conditions of structure, or how a formula or a stress diagram can be applied to certain forms of vaults or roofs. In the workshops also limitations are imposed; the subjects discussed have reference to set questions and answers for examinations. Demonstrations, to be of practical use, require to be made in the architect's office, or on the building when, in fact, the emergency arises. Both the technical school and workshop, as now in operation, are intended to test the student's knowledge of principles; so the art training of the school is intended to test the proficiency of the pupil in drawing or scale work. The exercises in design in various materials are taught apart from actual building or the workshop, so that we have many exhibits of admirable ingenuity and cleverness, many beautiful arrangements of ornament and detail which have no relation to anything else. Again, many of these essays are suggested by other designs for similar objects, and do not represent the student's power to create or evolve spontaneously from actual conditions.

In the remarks made by Mr. G. F. Bodley, A.R.A., after the presentation to him of the Institute Gold Medal, that gentleman asserted, with much weight, that the system of examinations would have the tendency to make the architect less of an architect, and his work less artistic and more professional and scientific. In this opinion we share, if these tests are conducted on the lines we have indicated. Technical and scholastic art courses, useful as they are as a discipline, are distractive, and discourage the student from pursuing his own resources and inclinations. They present to his mind opposite and independent courses of study having nothing in common—no united aim, and dissuade him from profitable and personal effort, in which he can see and understand the relations of design to material and workmanship.

Though not so definitely related to architecture as the technic and æsthetic, the importance of estimation and valuation must not be underrated in the scheme of the architect's education. Measurement and valuation of artificer's work is so intimately mixed up with the architect's requirements, that any neglect of this branch is a serious defect in his education. But it has a special value apart from its immediate use: it enables the architect to estimate the relative value of materials and labour, and to design his details with some regard to the cost. It will be found that the most careful designers of buildings are men who have learned to take out quantities, to analyse items of workmanship, and to assess their proper value. They will not throw away a lump of stone in a cornice if they are acquainted with the way the stone is cut up into beds economically, nor will they so thoughtlessly design a roof with a wasteful expenditure of timber if they have learned to measure and value the material in the different scantlings. The process of measuring labour in stone or wood will make him more careful in his details in apportioning it to the best advantage. The extravagant and redundant design is generally the work of men who have not learned the cost of material or the expenditure of labour.

To acquire each of these varied branches in a sense of due proportion is not a very easy task. They are perplexing and troublesome when each has to be learned in the order of their necessity; but when all three are put before the student at the very threshold of his studies, they become positively distasteful to the pupil who has been taught to regard architecture as one study instead of several. At present there is a want of unity of aim and direction in the modes of teaching these matters, exceedingly irksome to the student not endowed with large intellectual capacities.

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BUILDING SUPERINTENDENCE.

THERE is no Royal road to the knowledge of a building superintendent. He is generally a man who has learned his art on the building and in workshops, so that any attempt to lay down definite rules would be superfluous. He must be guided by circumstances. Nevertheless, it may be useful as far as possible to systematise the knowledge acquired by architects, clerks of works, and others engaged in superintending buildings, and there are many papers and articles read at societies that would furnish the staple of a set of directions. A recent writer in the *Technograph*, an annual published by the University of Illinois, Mr. Edwin B. Clarke, gives some useful advice on the subject. The superintendent is a person who comes in between the design and the execution of the building, or between the architect and builder, and his appointment is an inference that misinterpretations of the drawings and specifications or mistakes are liable to be made. The imperfect or unexplained plan is one of the chief sources of disagreement. The drawings are hurriedly prepared, and omissions and inaccuracies are the result. The builder finds the plan does not agree with the elevation on some point, as the position of a window, or that there is a discrepancy between the general scale and the dimensions given thereon or figured in the details. Every well drawn-up contract has a clause which refers to these discrepancies, providing which directions are to be followed, or referring the disagreement to the architect. The first duty of the superintendent or clerk of works, as we generally call him, is to examine and compare the plans, details, and specifications before the work is commenced so as to discover any omission or discrepancies that may occur, and to have them adjusted. The drawings should be full and complete, so as to show every part of the building. Two elevations are not sufficient if every side of the building is to be properly treated, and if the builder is to have no opportunity left for guessing. One section is generally inadequate to show the construction, and omitted detail drawings lead to all kinds of blunders. Mr. Clarke recommends numerous sectional drawings which shall show any unusual or special features, and also sufficient dimensions given to prevent mistakes and after-calculation. We believe it safer to put all dimensions on plans and sections than to trust to scale alone, which often leads to slight alterations and diminution; but some care is necessary that the general dimensions tally with the smaller dimensions of rooms and wall thicknesses, as when there is a discrepancy the builder prefers to take the dimension which favours himself. Mr. Clarke says, in figuring dimensions, it is "an advantage to give a string of distances between centres of main features, with subordinate lines of dimension for the separate parts of those features; and also to note on each plan the bays or dormers which are to centre with some other feature of the building above or below them." This course is followed in all well-prepared plans, especially as regards the "centring" of features. Cross-dotted lines marked "centre of dormer," or "centre of bay below or above," with the dimensions marked from a general axis, are sufficient. The setting out of the brickwork on each story is immensely facilitated by this method. We may also notice here the importance of dimensioning the widths of narrow piers and openings with reference to the bond of brickwork when possible.

The author of the paper we refer to also recommends a "building line," "usually the line of the first story above the water table,"—probably the ground-floor level is intended—as a base line from which to figure heights to be indicated by a red dotted line. It is a great convenience to the superintendent to have common lines of height marked on all the elevations and sections. Indeed, a few days spent in figuring and checking dimensions on the drawings will save many delays and costly mistakes, and render the pricing of the work easier. Vagueness in the documents is a source of uncertainty to the contractor who, to meet contingencies, adds a percentage to his estimate.

Mr. Clarke says the superintendent should have a complete set of drawings and specifications—a suggestion hardly necessary on this side of the Atlantic, as every clerk of works is furnished with such a set, and with all working drawings and agreements. Referring to "laying-out" the building, Mr. Clarke offers some good advice. A steel tape should be used in setting-out the work, and for a long line of dimensions it is more reliable to hold the ring end at a certain centre, marking off seriatim the several dimensions from the plan—a procedure that prevents accumulative errors. For regulating the widths of trenches and the building-line, a notched stick with a plumb-line is the best and easiest method to adopt, the latter being dropped from the stretched building-line. The superintendent should decide on all the necessary chases and channels for pipes and flues for gas, water, and wastes, if these are not shown in the plans, and a notebook in which all details, orders, extras, and agreements should be entered is, of course, essential, the dates invariably accompanying these entries. Frequent visits to the foundry, pattern, and modelling shops ought to be made to inspect the work in progress, and to explain points of detail.

These suggestions are of general value in most cases, and may be usefully followed by superintendents. Generally the clerk of works depends too implicitly on the accuracy of all plans and details; he does not think he is employed to check and alter the architect's design, but to insist on their being carried out at any cost—a view that may lead to serious disputes. Of course, he should consult the architect before any alteration or correction of importance is made, or, if left to his own resources, endeavour to get over any discrepancy in the best way he can. The experienced superintendent is seldom at a loss in these emergencies; but by a careful preliminary examination of the drawings, he makes himself master of the situation.

ESTIMATES.—XIV.

CARPENTER—(*Continued*).

IN most of our calculations we have priced the items for "mixed Swedish" yellow deals at about £10 to £11 per standard at the dock sales. The current prices vary considerably, as much as from £17 to £10 per standard; the latter price is for "fifths." Battens are about £1 10s. to £2 less. We have spoken of waste in sawing, and this element ought to be remembered in those items where the timber is sawn into scantlings of the required size. Mr. Leaning adopts the average of 288ft. of sawing per load, which is equal to about 3ft. cube for waste per load—*i.e.*, if we take that lineal dimension by 1ft. by ⅛in.

In the pricing of labour, the estimator ought to have a knowledge of the time taken to do certain kinds of work, the wage of the carpenter and joiner, how the work is planed, how fixed, and how nailed. The labour and nails to fir joists, to framed floors with girders, binding, bridging, and ceiling joists to common joists, and labour and nails to quarter partition and roofs, common and framed, can only be priced by experience of other similar work. The use of constants of labour at per foot cube or foot superficial will be found indispensable.

We give a few constants for labours on fir timber.

	Hours.
Cube fir bond	·50
Ditto, framed	·75
Ditto truss framed	1·00 to 1·6
Ditto framed and chamfered	1·50
Ditto wrought and framed	1·75
Ditto wrought and rebated	2·25
Ditto and ditto and beaded	3·00
Proper door cases	3·50

These constants are multiplied by the rate of wages per hour, or we may use constants which represent days and decimal parts of the day, in which case the factor applied is the rate of wages per day. Some of these are as follows:—

	Days of a carpenter.
Labour, fitting, and fixing fir in ground joists	·050
Ditto framed-in in floors with bridging joists and trimmers	·066
Ditto ditto framed in double framed floors	·090
Ditto on quarter partitions	·090 to ·100
Ditto ditto and trussed	·123
Ditto ditto in roofs	·090
Ditto ditto in roof trusses	·123

To apply some of these constants to floors and roofs:

	£	s.	d.
Cube fir in groined joists	0	1	6
Labour (carpenter, fitting and fixing), ·050 at 8s. 4d.	0	0	5
Nails, say	0	0	0½
Per cube foot (say 2s.)	0	1	11½

The same item worked out by the constant representing the rate per hour, or 10d.—viz., ·50 × 10d. = 5·0 = 5d., the same amount for labour.

30ft. cube, fir framed-in floors:—

	£	s.	d.
Cost of fir, say	0	2	2
Labour of carpenter (constant ·066 by rate of wages per day, or ·066 × 8s. 4d. = ·066 × 100d. = 6·6	0	0	6½
Nails	0	0	0½
Per cube foot	0	2	9

If multiplied by the constant per hour ·75, it would be ·75 × 10d. = 7·5 = 7½d. for labour.

130ft. cube fir framed-in roof trusses:—

	£	s.	d.
Cost of fir, say	0	2	2
Labour of carpenter (constant ·123) at current rate	0	1	4
Hoisting	0	0	1
Per foot	0	3	7

The constant per hour gives about the same for labour.

In the pricing of wrought timbers it is necessary to understand how the timbers have been taken and measured, whether they have been specifiedto be of the "*finished* sizes as fixed in the building," or whether the timbers are to finish less than the specified dimensions. If the specification provides that the sizes provided are the finished sizes, an allowance is made for planing by measuring the timber ⅛in. larger each way. The wrought or planed surfaces are measured by the foot superficial; but it is necessary that the estimator should know whether the measurement is for wrought face and includes waste in planing or not.

138ft. cube. Fir framed in roof-trusses, wrought and beaded, 3 faces.

One way, and perhaps the most satisfactory, is to take out the cube feet of timber in one truss carefully, the wrought or planed faces, beading, and other labours, pricing them at fair prices; the cube timber at 2s. 2d., the planing at 1d. per foot super., the beading at 1d. per foot run, waste, hoisting, &c., as before, and then to divide the total sum by the number of cube feet in the truss for the price per foot cube; but the simplest way is to apply the constant for labour for work of this description, as for example:—

	£	s.	d.
Cost of fir per foot cube	0	1	6
Labour of carpenter (constant 3·00 per hour), fitting and fixing, or 3·00 × 10d. = 30 = 30d.	0	2	6
Labourer's time, say	0	0	3
Per foot cube	0	4	3

Laxton prices this at 4s. 8d.

Or the value of the planing may be taken at, say, ¾d. to 1d. per superficial foot, the constant for which is ·010, and the beading or chamfering at ·003 day of a carpenter per foot run.

The constants for grooves are ·003 for a ploughed groove, and one 2in. girth across grain ·009; circular ditto, ·012; rebated are the same.

Mouldings,	2in. girth,	per foot run	·012
"	cross grain	"	·018
"	circular	"	·024
"	over 2in. girth...	"	—
"	straight	"	·072
"	cross grain	"	·108
"	circular	"	·144

If stopped, the constant is increased one-half.

182ft. cube. Fir in roof-trusses, wrought and framed.

These may be priced at from 3s. to 3s. 9d. per foot cube; add hoisting. These trusses are in large scantlings, and would have to be cut out of balk timber. We may price the items thus:—

	£	s.	d.
Cost of timber, say, £3 15s. per load in docks per foot cube	0	1	6
Cartage	0	0	[illegible]
Sawing at 3ft. in every load, say	0	0	1½
Waste, 10 per cent.	0	0	2
Hoisting and labour, putting together...	0	1	4
Per foot cube	0	3	4½
Profit	0	0	3
Say	0	3	8

The pricing may be simplified by using the constant as in item above.

The constant of labour for roof trusses is ·123, or equal to about 1s. 3d.

310ft. cube. Fir framed in ceiling joists.

These can be cut out of battens or deals.

	£	s.	d.
Cost of cube foot, as before	0	1	6
Cartage	0	0	2
Sawing, say	0	0	2
Waste, 5 per cent.	0	0	1
Labour (constant ·100)	0	0	10
	0	2	9

372ft. cube. Fir framed in partitions.

It is desirable to know, before pricing this item, whether the partitions are to be properly framed—that is, whether the vertical posts and studs are tenoned into the heads and sills or merely nailed. The tenoning of quarters is seldom done.

The timber can be cut from deals or battens.

	£	s.	d.
Cost of deals at £10 per standard, or £3 2s. 6d. per load, say	0	1	3
Cartage	0	0	2½
Sawing	0	0	2
Labour (constant ·090), say	0	0	9
Waste, 10 per cent.	0	0	1½
	0	2	6

420ft. cube. Ditto, all the quarters tenoned.

In this item all the timbers are tenoned, and therefore the labour will be more. Add, say, 2d. to the last = 2s. 8d. Some price this at 2s. 10d.

300ft. ditto. Ditto in trussed partitions.

Add 3d. to the last. In these partitions the trussed part is all framed—that is, the king or queen posts are framed or tenoned into head and sill, also the braces. If there is hoisting to be allowed for, an addition of 1d. or 2d. to any of these items.

62ft. cube. Fir in flèche, wrought and framed according to detail.

Before pricing an item like this, it is necessary to examine the detail carefully, to see how much is framed or trussed, the quantity of wrought or planed face, &c.

The items may be put down generally as follows:—

	£	s.	d.
Cost of timber at £3 15s. per load, per foot cube	0	1	6
Cartage	0	0	3
Waste, 10 per cent.	0	0	2
Labour, hours of a carpenter 1·75 = 17·5 =	0	1	5½
	0	3	4½
Add hoisting and fixing, say 70ft. from ground, say	0	0	1½
Per foot cube	0	3	6

230ft. cube. Fir in half-timbered work, wrought on all exposed faces, and grooved to receive plastering, framed as shown, and put together with oak pins, &c.

	£	s.	d.
Selected timber, say, per foot cube	0	2	2
Labour, constant 1·75 = 17·5 = 1s. 5½d.	0	1	5½
Oak trenails	0	0	1
	0	3	8½

82ft. super. Centring to trimmer arches.

Rough-sawn boards are used for the arches, and the material may be put down at 3d. per foot super.; labour about the same, say 7d.

12ft. super. Centring to apertures.

As the rough centres can be used again, a small price is sometimes put—say 6d. per foot super.

14ft. run. Centring to soffits 9in. wide.

This consists of two rough-cut ribs, with fillets nailed crosswise. Price this at 6d. per foot run.

14ft. run. Ditto to 14in. soffit.

Price this at 7d. The ribs would be the same for this, but the fillets would be longer.

5 squares 80ft. super. Flat-boarded centring to concrete floors.

	£	s.	d.
Boarding, per square	1	0	0
Constant days of carpenter ·60, days of labourer ·60, for fixing	0	10	0
	1	10	0

160ft. cube. Circular ribs to roof-trusses, including grooved and rebated joints, and dowelling with oak dowels.

	£	s.	d.
Cube fir, per foot	0	1	6
Labour, constant of carpenter ·250 = 25·0	0	2	1
Hoisting	0	0	1
	0	3	8

8 squares 80ft. super. Slate battening to roofs for Countess slating; battens 2½in. by ¾in.

This may be put at 6s. 6d. per square, including profit per square. The fixing only may be valued by constant ·17 day of a carpenter, which is equal to about 1s. 6d. per square.

3 squares 10ft. super. ¾in. sound-boarding and fillets to floors.

Put this at £1 per square. The constant for fixing is ·80, equals 6s. 8d. per square.

3½ squares super. Inodorous felt to roofs.

F. McNeill and Co.'s patent asphaltic roofing felt, 3/16in. thick, laid complete, including laps, is priced at 1s. per yard super., or about 11s. per square.

67ft. super. Wrought face on fir.

Price this at ¾d. or 1d. per foot.

40ft. super. Gutter-boards and bearers.

If these are 1in. deal, price at 6d. or 7d. The constant for fixing is ·030 = about 3d. per foot.

40ft. super. ¾in. deal feather-edged eaves-board.

This is worth about 2½d. a foot for material and ¾d. a foot for fixing—say 3½d.

36ft. run. Tilting fillets.

Price at about ¾d. per foot run.

60ft. run. 2in. rounded roll for lead.

Say 1½d. per foot run, if done by machinery. Fixing will cost about another 1d. per foot.

462ft. run. 2in. by 1½in. herringbone strutting, spiked to joists.

If we suppose there is about 2ft. 2in. of rough fillet to the foot run:—

	£	s.	d.
Fillet, 2ft. 2in., at ⅝d. per foot lineal, say	0	0	1¼
Four splayed ends cut to joist	0	0	0½
Labour and nails	0	0	1½
Per foot run	0	0	3¼

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SOCIETY OF ENGINEERS.

A VISIT was made by over fifty members and associates of the Society of Engineers on Tuesday, July 18, 1899, to the Folkestone Pier Extension Works and the Dover Colliery Works. These works comprise the extension, widening, and strengthening of the existing pier. They are being carried out from the design and under the control of Messrs. Coode, Son, and Matthews, Mr. Wm. Rigby being the contractor for the work, Mr. H. T. Ker the resident engineer, and Mr. J. Grice the contractor's agent. The existing pier is being extended for a length of 900ft., 300ft. of this being in continuation of the line of the present work, and 600ft. canted at an angle of 36 degrees, so as to form a sheltering arm. The extension of the pier is composed throughout of Portland cement concrete blocks, weighing on an average 17 tons, the heaviest blocks used being 20 tons. The work is built from a staging, covering the width of the pier, in two spans of 53ft. The centres of the spans longitudinally are 40ft. apart. When the work covered by the innermost bay has been completed, and the girders are available, the staging is taken down and re-erected at the outer end. Piles, 18in. square, in clusters of four and six, are driven to form dolphins, this being accomplished by steam winches from cantilever pile engines. When the dolphins have been completed, the lattice girders, which have been removed from the inner end, are floated out on a barge, and lifted by the piling winch into position. The road on top of the girders is then laid, and the pile engines are ready to be run out for the next bay. Upon the top of the staging there are four travellers or Goliaths. The two outer ones, from which the diving-bells are suspended, are capable of dealing with a working load of 30 tons. The two inner travellers are used for block-setting only, and their maximum working load is 20 tons.

The mode of procedure adopted for preparing the foundation is as follows:—The sand, shingle, and soft material are removed by 1¾ cubic yard grabs, worked from the 30-ton travellers. After the soft material has been removed the bells are lowered, with four men in each, to excavate the hard stratum and to level it so that the foundation blocks may be set on a perfectly level and even bed. The diving-bells are 12ft. 9in. by 10ft. 6in. by 6ft. 6in., and weigh 26 tons. When the beds have been prepared, the 20-ton travellers, which in the mean time have been working at a higher level, are brought forward to set the foundation blocks, after which the bells resume work.

The work is brought up in lengths of about 60ft. at a time. The blocks in the underwater portion of the work are laid block on block without mortar joints, and the face blocks are joggled together, and to the next blocks in from the face, by round concrete joggles, which are deposited in bags by divers. Above L.W.O.S.T., the outer blocks are faced with granite blockers, and the blocks are bedded in mortar and the joints grouted.

Berthing places for the steamers are provided, and these have two landings, one at cope level, for use at high tide, and one at 13ft. below cope level, for use at half and low tide. The upper landing is supported by greenheart piles, which carry girders to form the deck. A sheltering parapet will be built on the west side of the pier, covering the railway platform, for the protection of passengers during rough weather. The level at which the pier is now being founded is 34ft. 3in. below L.W.O.S.T., and at the extreme end of the pier the depth of the foundation will be 42ft. below L.W.O.S.T. The total height of pier at the head, from foundation to top of parapet, will be 86ft. 6in.

The blocks for the pier are made in a yard conveniently situated. The concrete is made by two mixers, each of one cubic yard capacity. It falls from the mixer into a hopper, from which it drops as required into waggons, which run on staging fixed at a height sufficient to allow the waggons to tip freely over the top of the block moulds. The moulds are struck three days after a block has been made, and the block, when six days old, is lifted by the yard traveller and stacked. The blocks remain in the stacking for four weeks, and are not set in the work until they are five weeks old. The cement shed has a capacity for 1,300 tons. It is divided into 100-ton bins, and each bin is large enough to give room for turning.

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SOME BEDFORDSHIRE BUILDERS.

IT has been said times and oft that nearly all the best men in the building trades in "London town" hailed originally from the provinces. The record of a comparatively small shop in a Bedfordshire village is no mean one, but perhaps it may be beaten by others known to some of our readers. Kempston is a scattered village, less than two miles from Bedford's historical county town, the old home of the renowned John Bunyan. Passingly we may observe that Kempston is one of the most remarkable villages in England. It is no less than seven miles long, and to walk from one end of it to the other occupies two hours. In the early "sixties" a builder there—the late Mr. John Conquest—did a fairly extensive business, especially in church renovations. The Duke of Buccleugh was at that time restoring most of the churches on his Northamptonshire estate, from the designs of the late Mr. William Slater, architect, of 4, Regent-street, S.W. Mr. Slater had originally been managing clerk for the late Mr. Carpenter, senior. He ultimately, at the latter's death, took to the practice, and brought up the late Mr. R. Herbert Carpenter, his former employer's talented son. Some time after Mr. Slater's sudden death at his residence, near Claremont-square, N., on the afternoon of Tuesday, December 18, 1872, Mr. Ingelow, a senior member of the staff joined young Mr. Carpenter in partnership—a union that lasted until the latter's early and comparatively recent decease. When Mr. Conquest, after a lingering illness of consumption, passed away, the business at Kempston was continued by the late Mr. Winn, his outdoor foreman—a bricklayer by trade—in conjunction with young Mr. Samuel Foster, who had been articled to Mr. Conquest. Later on, Mr. Winn died, and ever since Mr. Foster has had a large and extensive experience as an enterprising provincial builder at the same premises. Looking back 36 years this very month (in 1863), a visitor to the first woodworking shop in Mr. Conquest's yard might have espied at the first bench a dapper bright-eyed little joiner named Thomas Boyse, who is at present the popular Mayor of Buckingham, and a high-class prosperous builder in that county. On the next toiled a painstaking apprentice called Dudley, who afterwards became a large speculating builder on the suburbs of London, and, having made his fortune, is now, in the season, a well-known figure in scarlet riding to hounds. Next to him, again, was a ruddy-faced young fellow named Harry Hems, working then as a journeyman woodcarver—to-day the senior of the widely-known firm of ecclesiastical sculptors, Harry Hems and Sons, of Exeter. A bench further on was a tall, well-built young joiner named George Haines. He afterwards went into business on his own account as a builder in Bedford, and, having obtained a comfortable competency, now lives retired in his fair native town. There were others who might have been seen diligently at work under the same roof in 1863, who afterwards went into the world, and made therein successful marks in life's battle. Perhaps the smartest—certainly the longest-headed and best workman of them all in those days—was their foreman, Mr. William Harris; but the ancients used to say, "Whom the God's love, die early," and William Harris, able and good man as he was in every varied phase of life, passed away long years ago. His memory is still green, however, and hundreds who read these lines will pause a moment and say: "If ever there was a good all-round craftsman in this world, William Harris was that man!" He died in London, foreman of a large organ manufactory.

H.

THE PROTECTION OF SEA-BANKS.

(CONCLUDED.)

THE whole sea-coast of the Northern Ocean is, as was explained in our former article on this subject, especially open to the incessant assaults of its maritime invader. Different cases of the encroachments of the waves upon the foreshore and the land above it, require different remedies, and the protective works that would be both efficacious and durable in one situation and under certain conditions would be totally inadequate to meet the duty imposed upon them in other localities where the demands were of a more onerous character. Of the three principal modes of construction adopted in Europe for defensive works of the nature under notice, one has been already described and illustrated. The remaining two are examples of the German and Belgian systems, which are designed upon special lines of their own, and vary both in form and principle from those of Holland, and those in other more distant countries also. The peculiarity of the German type of sea-wall is that it is invariably built as represented in Fig. 1, with a curvilinear profile or contour consisting of a double curve commencing from a common tangent. At the summit of the upper curve the wall becomes little less than a broad ledge or area of so much pavement, constructed in the same manner as the rest of the defensive work, but of slighter proportions. Thus in Fig. 1 the flat portion is lettered A and the two curves B and C respectively, the former being convex and the latter concave. A comparison between this example and that illustrating the Dutch type of wall in our previous article will be instructive for two reasons. In the first place the form is totally different, and in the second, so is the mode of construction. It is, however, to the intimate relation existing between these two distinguishing characteristics that particular attention should be directed. In other words, when the form of wall is altered it follows as an inevitable necessity that it must be built upon altered lines. This relation may be mathematically expressed by stating that the one is an independent and the other a dependent variable, and if we call one x and the other y, we shall always have the equation—

$$y = F(x).$$

The type of wall shown in cross-section (Fig. 1) cannot be divided into more than two separate parts, as, except as regards mere dimensions, the greater portion of it displays a remarkable degree of uniformity in its erection. There is what may be termed the wall proper, extending from the solid high land at S to the first or inner row of piles P, driven at the toe, and further secured, so as to form part and parcel of the whole in a manner to be subsequently explained. Between the inner and the outer rows of the toe-piles, P and P, the remaining part of the wall or apron is built of a different contour, and with different materials to those used in the upper part. The apron, commencing the description of the structure from its seaward extremity, is constructed in the following manner:—After the rows of inner and outer piles, P and P, have been driven down to the required depth, a flooring of rough unhewn timbers and fascines is laid upon the sloping bed of the foreshore as showh at D in Fig. 1. By the action of the waves, the sand perpetually advancing and receding, becomes intercepted in the interstices and meshes of the fascicular framework, and ultimately the whole mass assumes the consistency of a thorougly well incorporated and permanent consolidation. If this platform or flooring were exposed after its complete amalgamation to the influence of the flowing and ebbing of the tide, it would, in a very brief period, become utterly disintegrated, and would, in fact, go to pieces. In order to prevent all chance of its rapid dissolution in this untimely manner, the surface is protected by a solid facing, which may consist of concrete blocks or the same material *en masse*, of rubble or a more expensive description of stonework, or of plain brickwork set on edge. In fact, any hard, dry, clean, and sound material may be used for this purpose, and the sample selected will depend altogether upon what means and facilities the neighbourhood and district possess for furnishing a supply of one material or the other. The double-curved wall itself is built upon a concrete foundation, or, rather, bed, as the depth to which it is sunk is comparatively insignificant. Upon the concrete a double course of bricks on edge is laid, and the whole well run in with Portland cement grouting.

FIG. 1.

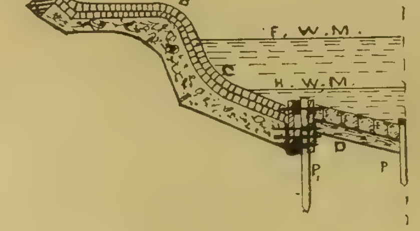


FIG. 2.

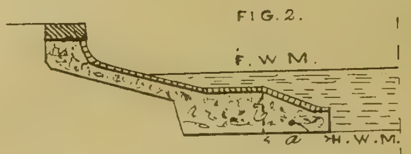
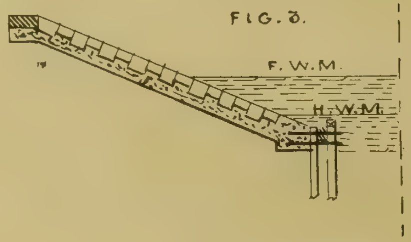


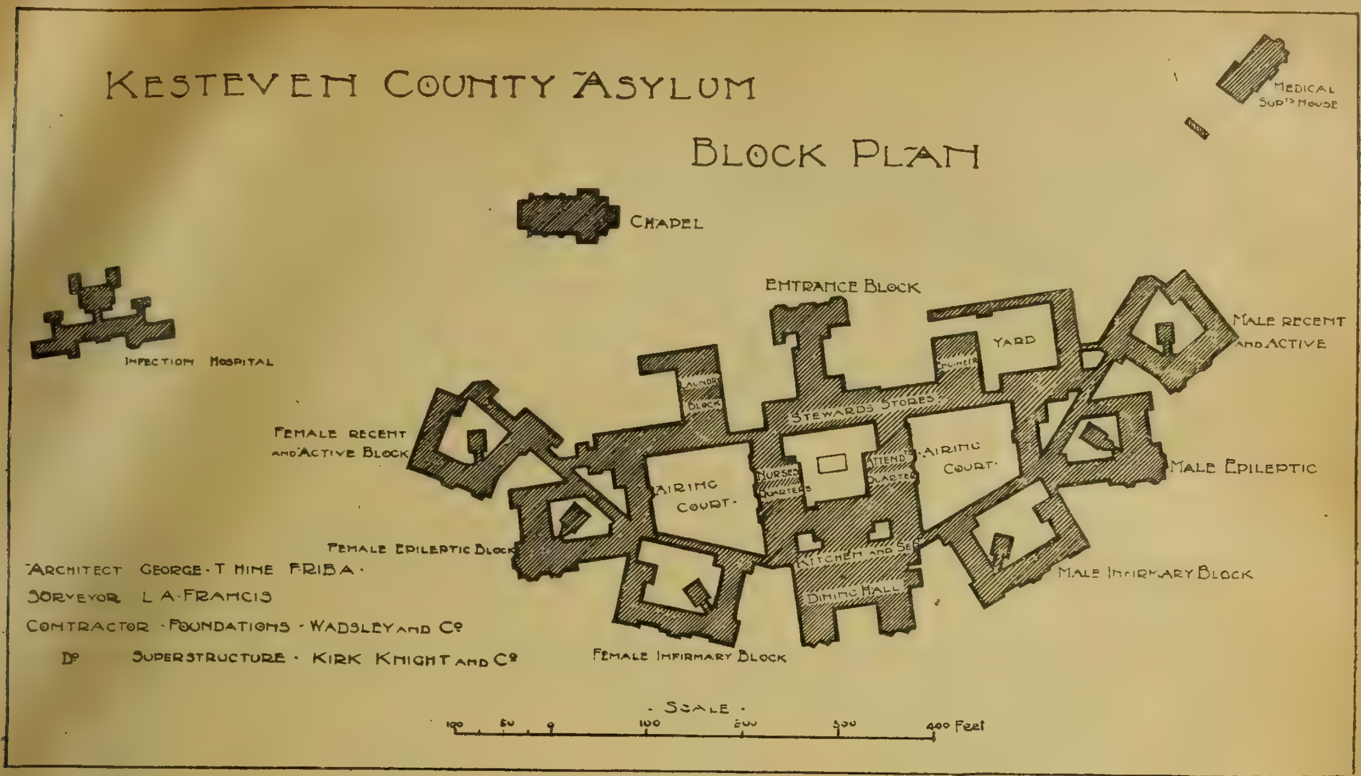
FIG. 3.



An important feature in the construction of the German system of sea-walling is the necessity of making a strong, rigid, and perfectly durable connection between the sea-wall proper and its apron and toe part. A reference to Fig. 1 will indicate how these two separate portions of the entire fabric are made one. Upon the outer face of the inner row of piles P, a series of planks are spiked or, preferably, bolted to them, while on the inner face a pair of longitudinal waling pieces are fixed, and behind them there is a series of inner longitudinal planks. Bolts, which should not be less than an inch in diameter, connect together at top and bottom the two rows of planks, the inside waling pieces, and the inner row of toe-piles. The apron is furthermore directly attached to the concrete bed of the wall by a pair of longer bolts shown in the figure. In the example selected the ordinary high-water and flood-water levels are indicated by their respective letters. There is a modification of the German system, which is sometimes employed in cases where the difference of level between high and flood water is comparatively small, and where the foreshore has a very flat slope. While in these instances the general contour of the double curved type is adhered to, the apron is much longer, and is built in a different manner. Instead of the timber and fascines covered by a solid facing being simply inclosed within two extreme rows of piles, as in Fig. 1, a number of intermediate piles are driven under the apron, as its greater length requires. It is unnecessary to trespass upon our available space by giving a cross section of this particular form of wall, as, with the exception alluded to, the construction is perfectly similar to that already described. We may now proceed to the consideration of the third and last type, which is the Belgian, and one which differs in many important features from the other two.

This system of coast defence is represented in Fig. 2, and it will be at once observed that it dispenses altogether with the use of timber, which is largely employed in the majority of other similar structures. It is built entirely of concrete, with a stone facing for which brickwork is often substituted. The duty performed by the toe-piles in supporting the wall in Fig. 1 is carried out in the design in Fig. 2 by the short sloping apron of concrete marked *a* in the cut, and, in fact, the whole structure is retained in position partly by its own great insistent weight, and partly owing to the small angle at which it slopes seaward. There is scarcely any tendency towards slipping, or any sliding action, such as is apparent in the type shown in Fig. 1. All the various designs of sea-walls may be included between two extremes, the one being the vertical, and the other the long shape, or *pierre-perdue* principle, which may have almost any angle with the horizontal short of zero. An example of the latter form, which is much used, is given in Fig. 3, in which a double row of piles are driven to support the wall at the end of the long slope. The concrete mass of the wall and the timber work are tied together by long bolts in much the same manner as is done in Fig. 1, but not quite so elaborately. A combination of the two systems was represented in our last article, in which the apron of the wall was constructed upon the long-slope method; but the face of the wall itself was curved with an upward slope of about two to one.

An accurate and clear comprehension of the nature and theory of wave-motion is indispensable to those engaged in the designing and practical construction of sea-walls and coast defences. A considerable amount of judgment and discrimination must also be exercised in the selection of the particular type of wall, which is the best adapted to suit the contours of the coast line, the depth of water, the height of flood level, and the character and consistency of the foreshore. It may seem a little curious, but it is no less true that many persons who possess undoubted claims to scientific knowledge entertain very erroneous opinions respecting the theory of waves and the cause of their tremendous violence. There are many varieties of waves, but the two which have more immediate bearing upon our subject are the two known as waves of oscillation or undulatory waves, and waves of translation, and it is in the confounding of these two that has given rise to so much and serious misunderstanding. It may be stated briefly, that the advocates of the vertical-wall principle contend that in deep water, for which this system is especially applicable, the waves are simply those of oscillation, and possess little or no impactive force. In other words, they never break, and so pass into waves of translation, which subject every impediment in their way, whether natural or artificial, to violent impact and concussion. Nautical men, while agreeing generally with this statement, have maintained that, from various causes, waves of oscillation do sometimes break in deep water, and thus become converted into waves of translation. The manner in which the waves act upon vertical and inclined walls will be apparent from the following facts, which are convincing. It has been frequently observed at Portland that when the waves meet the circular heads of the passage between the two breakwaters, which consist of vertical walls, twenty-four below the level of low-water mark, they rise ahd fall in a perfectly gentle manner, while only some 200 yards off, where the long slope wall occurs, the sea runs up and down with great fury and violence. The waves of oscillation in the first instance are converted into waves of translation in the second, and it has been deduced by Mr. Scott Russell, from actual experiment, that a wave of oscillation will become changed into one of translation when the height of the



wave equals the depth of the water. As an additional coast protection, groynes are often attached to sea-walls; but that is a subject which we may consider subsequently. T. C.

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KESTEVEN COUNTY ASYLUM.

THIS extensive asylum now in progress is situate at Rauceby, near Sleaford, in the county of Lincoln, and is being built for the Kesteven County Council from the plans of Mr. George T. Hine, F.R.I.B.A., of Westminster. The foundations have been completed by Messrs. Wadsley and Co., Billingborough, Falkingham, and the contractors for the superstructure are Messrs. Kirk, Knight, and Co., of Sleaford. Some very interesting photographs of a complete character were taken of the whole of the foundation works, and a set was kindly sent us for illustration by Mr. W. F. Peacock, of Billingborough, with the plan given herewith. We have been unable to reproduce the views, owing to their smallness of detail; but the block plan illustrates the extent and ingenious character of the plan with the main airing courts right and left of the administration building, the whole group being united by a continuous corridor. The asylum, when completed, will accommodate 150 males and 150 females, of which 25 females and 25 males will be paying patients. Provision is made for extending the accommodation for 200 more inmates. The chapel will seat 300. There is a farm and bailiff's house, an infection hospital, and medical superintendent's house separated from the main buildings. The works are being carried out with all the best and latest improvements in warming, lighting, cooking appliances, and washing apparatus machinery, drainage, water service and storages, &c.

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TIMBER FOR PILES AND SLEEPERS.

WHILE it will be universally admitted that there are several varieties of forest trees which furnish what may be termed a "good all-round timber" for various constructive purposes, yet it is nevertheless equally incontestable that some species are better adapted to certain kinds of work than they are to others. Of all the situations in which timber may be located—and they are exceedingly numerous and always will remain so in spite of the enormous use of iron and steel—the two severest and most exacting are when the material has to act in the capacity of piles and railway sleepers. It is quite true that, to a great extent, the introduction and extensive employment of cement concrete has relieved timber piles of a considerable amount of hard service which in earlier times was imposed upon them. The best historical example of the value and durability of timber piling is to be found in pile-built Venice, the old Queen of the Adriatic, whose wooden supports and foundation enthroned her on her hundred isles. In the case of the pile, after the great whole balk, or the smaller half-timber has been shod with iron at the foot, and ringed at the head, the *peine forte et dure* commences, and only ceases when the wooden column has been forcibly driven down to its bearings by an unremitting succession of repeated hard blows. At the same time, the operation of driving is not by any means always successful by "the first intention." It is not at all an uncommon occurrence for a pile to be drawn, reshod, rehooped, and redriven, although the whole process is both troublesome and tedious, and consequently not resorted to except under circumstances of emergency by any of the parties charged with the supervision and execution of the work. It is perfectly well known to all those who have been engaged on pile-driving on a large scale—take the walls and floors of a graving dock as an example—that a considerable number of piles which are "got down" to all appearance with perfect success leave their shoes behind them in the upper strata. The shoes get wrenched, twisted out of all shape, and otherwise torn off during the descent of the pile by being violently forced into contact with stones and boulders encountered *in transitu*. Some years ago, when the piles of an old dock at Genoa were drawn and laid partially bare, in order to get in the foundations for a much larger and deeper structure, it was discovered that out of every hundred piles about nineteen were shoeless.

Once "down," however, the subsequent duty devolving upon piles is comparatively light, as the effect of the static load, however great, superimposed upon them is practically of little importance after the incessant violent shocks and dynamical action to which they have been subjected. The case of a railway sleeper is almost the exact antithesis of that we have just considered. After being adzed, bored, and the chairs bolted to it—presuming, as in all English railways, chairs are used in the permanent way—it is fixed in its permanent position, the rails laid down, and the ballast made up to the proper level. It is then that its hard work commences. For the rest of its life it is exposed to the everlasting hammering of the massive driving wheels of countless trains succeeding each other in never-ending continuity, morning, noon, and night.

With one or two exceptions timber that answers well for piles will be nearly equally serviceable for sleepers, though a good deal depends upon the nature of the soil upon which the one is laid and the character of the substrata into and through which the other may be driven. For firm soils, the hard pines, fir, beech, oak, and elm are excellent material for piles, but special precautions are necessary to protect them in tropical and southern climates from their terrible and relentless enemy the *teredo navalis*. Among the different woods used for sleepers—for, in foreign countries it is very often a matter of Hobson's choice—are the fir, the different varieties of pine, the oak, the larch, and the beech, and where money is abundant the eucalyptus and the teak. All these timbers, both in the case of piles and sleepers, may be used under two conditions. They may be employed either native, or after having undergone one or other of the numerous processes of preservation applicable for that purpose. It is not generally known that there is a difference to be observed in the treatment of the trees, accordingly as their timber is to be preserved or not. If the wood is to be used in an unpreserved condition, the best season for felling the trees is in the winter, when the sap is sluggish and inert. But if, on the contrary, it is to be subjected to a preserving process, the proper seasons are the spring and the summer, for the reason that as the sap at those times of the year flows freely, it is the more readily ejected by the forcing operation, and the pores of the wood filled more easily with the antiseptic injection. Both at home and on the Continent, especially in the southern parts of Austria-Hungary, sleepers of native larch have performed duty for upwards of thirty years, and the blue gum under the same conditions has proved equally serviceable.

Were it not for the high price, sleepers of oak would be used, to the exclusion of many other woods. Experience on many lines has shown that when altogether of heartwood, the sleepers will last for over twenty years, and even when accompanied by the permissible amount of sapwood—for a certain percentage of sapwood is allowed in all specifications and contracts—they are good for rather more than half that time. By creosoting oak sleepers, their life is prolonged, as a maximum, to nearly fifty years, and if chloride of zinc be the preserving solution there will be only a few years' difference in their longevity. Beech possesses many advantages as a timber for both sleepers and piles. It costs less in the first place than either oak or pine, it lends itself with greater facility to processes of injection, and beechen forests have a more rapid growth than those of the other two woods. It is, however, absolutely necessary that this timber be subjected to some preserving solution, for if it be not, its life as a sleeper will be limited to a very few years. When thoroughly well creosoted, sleepers of beech have been known to last for fully 25 years. Fir makes but a poor sleeper, preserved or unpreserved, but its place is well supplied by one or other of the pine tribe. When laid native, pine sleepers will do good service for ten or twelve years, and well creosoted for about double that time. Injections of both chloride of zinc and sulphate of copper will give a lease of life of about 15 years. It has been found that in some instances the addition of a certain quantity of crude creosote to the former solution very notably augments the efficiency of the preservation. New sleepers are invariably laid down in the first place upon the main tracks of a railway, but it must not be supposed that the life of a sleeper ceases when it is taken up from that position. Quite the contrary, as it is then transferred to paas the rest of its existence in doing duty on sidings, shunts, loops, and side lines, where it will last for another five or six years. Under any circumstances, the life of a sleeper is comparatively a brief one; but timber piles, under certain conditions, and in certain situations, are practically indestructible, and may in ordinary parlance be said to last for ever.

T. C.

IPSWICH NEW WORKHOUSE.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATION.]

By the courtesy of Mr. H. Percy Adams, F.R.I.B.A., the architect, we are able to give our readers a view of the new buildings which the Ipswich Board of Guardians have erected near Rushmere Heath for the housing of the poor. The buildings, the main lines of which follow the points of the compass, are of simple design, and constructed of local red bricks, with Welsh slate roofs. On the right of the principal entrance stand the vagrant wards, which are quite isolated, with quarters for the official who has charge of the tramps. Vagrants of both sexes are provided for, the rooms partaking mostly of the nature of cells, some of which will accommodate several casuals. On the upper floor of the vagrant wards are rooms in which to store the clothing of inmates when taken from them on leaving the receiving wards for their respective places in the workhouse. The central portion of the main block of buildings comprises the administrative area, including a committee-room and offices, master's residence, dining-hall, kitchen, sculleries, laundry stores, and serving-rooms. The dining-hall has an open-timbered roof of pitchpine, with a dado of glazed brick 5ft. high. There is a gallery at one end, at the first-floor level, which is approached from the entrance-hall, thus affording an excellent means of supervision and accommodation for visitors. Immediately behind the dining-hall is the kitchen, lighted from the roof, with steam-jacketed boiling-pans, for soup, tea, and coffee; also steam ovens, carving-tables, with hot dishes, &c., all fitted with steam appliances direct from the main boilers. Corridors running right and left of the administrative block (and cross-ventilated by iron grills only), connect with the two principal wings, designed for the accommodation of male and female paupers, further classification being possible, besides allowing a good measure of comfort for the aged and infirm. Quarters are also provided for old married couples. The infirmary is reached from the main block by a corridor, from which is entered the central portion of the building, and from this point corridors to the left and right lead to the male and female ward pavilions. On the first floor of the central block are lying-in and children's wards, these special apartments being entirely cut off from the main building. On the second floor are situate the nurses' bed and sitting-rooms. The front of the infirmary faces the south, and from it access to large covered balconies at the level of the first and ground floors is possible from all the wards. All the walls of the wards are lined with hard cement, while the bathrooms, lavatories, w.c.'s, &c., are lined with glazed bricks. All the internal angles of walls, and between walls and ceilings, and walls and floors, are quadrants; projections or mouldings are absolutely dispensed with, so that there may be no lodgment of dust, and every part of the building may be swept and kept clean. There are also, for proper ventilation, additional inlet flues, formed of glazed stoneware pipes, at the floor level under each bed, and extract flues at the ceiling level, the whole of which are assisted in their action by the proximity of the smoke flues. The heating of the large wards is by means of central stoves, with horizontal flues in the thickness of the floors, which are supplied with fresh air direct from outside. When warmed, these flues distribute the heat evenly throughout the wards. The cost of the buildings, including engineering work (and all machinery), electric-lighting plant, fire hydrants, and all steam laundry fittings, fences, gates, and everything complete is just over £30,000. The architects who jointly designed the buildings are Messrs. H. Percy Adams, F.R.I.B.A., and W. Lister Newcombe, F.R.I.B.A., and the whole of the works have been carried out entirely under the superintendence of Mr. H. Percy Adams, who has been assisted by Mr. H. Cockrell in his capacity as clerk of works. The contractors are Messrs. Geo. Grimwood and Sons, of Ipswich and Sudbury.

OBITUARY.

Mr. Melvin H. Hapgood, architect, of New York, died last week at the early age of 39 years. Mr. Hapgood was educated in Boston, Mass., where he finally held a position in the office of Mr. Preston. He left to visit Europe, and on his return accepted a position in Hartford, with John C. Mead, designing many important buildings during his stay there. In 1890, at Mr. Mead's death, Mr. Hapgood and Mr. Cook continued the business under the firm name of Cook, Hapgood, and Co. They were very successful, and did a very large business. In 1893 Mr. Hapgood formed a partnership with his cousin, Edward T. Hapgood, under the name of Hapgood and Hapgood, architects, which partnership is now terminated by his death.

CHIPS.

We regret to announce the death of Mr. Douglas Stewart, M.S.A., architect, of Bournemouth, who died suddenly on Sunday night, July 9th, after an operation. Mr. Stewart was in his forty-seventh year, and had been a member of the Society of Architects since 1887.

The partnership which has hitherto subsisted between A. H. Osmond and W. A. Symmons, auctioneers, architects, surveyors, &c., Southampton, under the style of Osmond and Symmons, has been dissolved.

St. Andrew's School Church, South Levensholme, was opened by the Bishop of Manchester on Saturday. It has been erected from the designs of Mr. H. E. Stelfox by Mr. George Macfarlane. The building is of brick, faced with Accrington bricks throughout, with stone dressings. School accommodation is provided for 200 children, and the mission-room provides for over 300 people. The cost, exclusive of furnishing, is about £1,600.

On Tuesday week Col. W. Langton Coke, M.I.C.E., one of the inspectors of the Local Government Board, attended at the town-hall, Ipswich, to hold an inquiry as to an application by the town council for sanction to a loan of £3,000 for the extension of the free library and museum. The town clerk, Mr. W. Bantoft, appeared for the corporation, and others present were Mr. Henry Miller, the architect of the proposed additions to the museum buildings (which will form a wing facing St. George's-street, at the rear of the existing institution), and Mr. Thomas Parkington, the contractor.

At Bagshot parish church, on Sunday, a new organ and two memorial stained-glass windows were dedicated.

The new boys' schools which have been erected at S. Barnabas's, Rainbow Hill, Worcester, were opened last week. The buildings include a schoolroom for 96 boys, and two classrooms, each for 32 boys, lavatories, and cloak-rooms. Messrs. Henry Rowe and Son, Worcester, were the architects, and Messrs. J. S. Wood and Sons carried out the work, the cost of which is £1,300.

A brass eagle lectern has been presented to the Garrison Church, Shorncliffe, to the memory of the late Major-General E. A. Wood, C.B. (Commandant Shorncliffe camp), by his comrades and friends. The lectern has been executed by Jones and Willis, of London and Birmingham.

An interesting collection of mummied animals from the excavations conducted at Dendereh by the Egypt Exploration Fund has been presented to the Natural History Museum at South Kensington. It comprises oxen, birds, dogs, and remains of mammals and reptiles. The embalment is estimated to have taken place about 1400 B C.

The members of the British Archæological Association are holding their annual congress at Buxton this week. The proceedings were opened on Monday by a reception at the town-hall, and on Tuesday Bakewell Church and Haddon Hall were among the places visited.

COMPETITIONS.

Bradford.—At a meeting of the Markets and Fairs Committee of the Bradford Corporation on Monday, the competitive plans for the extension of the Rawson-place market were inspected, and the first premium (£100) awarded to Messrs. T. C. Hope and Sons, architects, of Bradford, and the second (£50) to Messrs. Mawson and Hudson, Bradford. The architecture of Messrs. Hope's plan is in keeping with the present building, and all the three fronts in Rawson-place, Northgate, and James-street will be faced with cleansed ashlar stone. The principal entrance is to Northgate, and over the entrance is a substantial tower, with a dome roof. The proposed hotel occupies the corner of Rawson-square and Northgate. The total cost is estimated at £20,000.

Leeds.—The Leeds Free Library Committee have decided to advertise for designs for a branch library at Stocks Hill, Armley. The cost of the building is not to exceed £5,000. In addition to the library, there is to be a general reading-room, a boys' reading-room, and a ladies' reading-room.

Totnes.—At a meeting of the cottage hospital subscribers, held on Wednesday week, the chairman stated that the committee had offered a premium of ten guineas for the best design for a new cottage hospital. Mr. W. Henman, of Birmingham, was engaged as assessor, and recommended the adoption, from 22 sets of plans submitted, of the design with the motto "Workable" (Mr. Richards, Torquay), and to him the committee awarded the premium. The assessor estimated the cost would be £1,500, but Mr. Richards had, in accordance with his suggestions, made some modifications, and estimated the cost of the building at £1,350. The chairman moved that the plan be approved, and that the committee be empowered to carry it out, and subject to some alterations as may be approved by the assessor. This was agreed to. The chairman added that building would commence as soon as the agreement with the Duke of Somerset's agent was ratified. The new building will provide for nine beds, with operating-room, bath-room, accommodation for nurses, and a mortuary. The assessor (Mr. Henman) had returned his fee of 20 guineas as a contribution to the funds.

A new institute is being erected at Steeton, from the designs of Messrs. Judson and Moore, architects, Keighley, and special consideration is being given to the ventilation, which will be carried out on the Boyle system.

On Wednesday week the Dean of Windsor laid the foundation-stone of a church house at Hungerford. The site and entire cost of the buildings have been presented to the church in the parish by Sir William G. Pearce, of Chilton Lodge. The buildings will comprise a large lecture-room, a club-room and offices, apartments for a curate, and a caretaker's residence. The architect is Mr. A. C. Blomfield.

The Rochdale Corporation have appointed Mr. W. T. Tomlinson, who has been in their service for over thirty years, manager of the newly-acquired waterworks at Ramsden, and have raised his salary from £300 to £400 a year.

At the Municipal Buildings, Taunton, on Tuesday, Col. A. J. Hepper, D.S.O., R.E., one of the Local Government Board inspectors, held an inquiry into an application by the Taunton Town Council for a loan of £10,000 for the purposes of electric lighting.

After a prolonged discussion the Godalming Corporation have resolved to purchase the undertaking of the Frith Hill, Godalming, and District Water Company, the estimated outlay involved being £72,250.

Mr. John Lambert, of Bristol, a builder, and a prominent worker among the Primitive Methodists in the West of England, has left, besides several amounts to medical charities, £12,000 to Müller's Orphan Asylum, on Ashley Down, and £2,000 to the Bristol Diamond Jubilee Convalescent Home, which is to be opened in November by the Queen.

The Drapers' Company has purchased for the sum of £4,000 a piece of land adjacent to the Poplar Hospital, and intends erecting upon it, at a cost of £10,000, a ward for the treatment, not of accidents, to which the Poplar Hospital has hitherto been exclusively devoted, but of medical cases. In addition, the company has offered to subscribe the sum of £1,000 annually towards the maintenance of the beds. The gift capitalised represents a sum of no less than £50,000. The plans of the additional wing have been already prepared by Mr. Rowland Plumbe, F.R.I.B.A., and the building will be proceeded with almost immediately.

Building Intelligence.

Birmingham.—The General Purposes Committee, in a report to the city council, state that a lease for 999 years of the land bounded by Congreve-street, Edmund-street, Margaret-street, and Great Charles-street, the property of the Colmore trustees, has been executed. It provides that the corporation shall clear the land within five years from March 25 last, and shall erect new buildings thereon at a cost of not less than £100,000 within ten years from that date. The committee propose to provide on the new site for the Health and Water Departments, leaving the rooms now occupied by the former for the extension of the Public Works Department. The ground-floor space estimated to be required by the Health Department is 5,760sq.ft., and by the water department 11,500sq.ft., or a total of about 17,500sq.ft. The total floor space estimated by the Museum and School of Art Committee to be requisite for a new art gallery, which, for lighting purposes, will necessarily be over the proposed Health and Water Departments, is about 16,000sq.ft. The general proposal thus submitted has been approved by the council, and the committee will consult Mr. Aston Webb, A.R.A., in the competition about to be held, and he will report further when he has advised them upon the various preliminary points that must arise.

Cambridge.—Under the auspices of Homerton College, Cambridge, a model school is being erected in the growing suburb of St. John's parish. The building is to be a practising school for the students at Homerton College, and is named after Mr. Samuel Morley, who was one of the founders of the college. The new school is situated in Blinco-grove, and will be of a white brick, with pitch-pine flooring, and will accommodate 240 children. The large room will be 60ft. long, 22ft. wide, and 16ft. high, and will be divided by a movable partition. Two classrooms are divided for, each 30ft. by 20ft., and 16ft. high. The rooms will be ventilated by a flue at ceiling level, carried up with the chimney-stack. There are two entrance porches, one each side, paved with tiles, and two cloakrooms, one each side, each 17ft. by 8ft., fitted with a range of lavatory basins, with water supply. The building is being erected by Messrs. Coulson and Lofts, of Cambridge, under the superintendence of the surveyors to the college, Messrs. Bidwell and Sons, of Cambridge and Ely.

Edinburgh.—On Saturday, the corner stone of a new Episcopal church in course of erection at Murieston-road, Dalry, was laid by Bishop Dowden. At present only a portion of the church will be erected, the cost of this section being about £7,000. The Early French Gothic style is adopted for the church, which will consist of nave, aisles, and sanctuary, with large hall, classrooms, and vestries below. The portion of the nave at present being erected is 63ft. long by 49ft. The seating is for 500. The large hall below will accommodate about the same number. The main entrance is approached by a broad flight of five freestone steps over 30ft. in length, the church being entered by deeply-recessed arched doorways, having enriched arched traceried windows grouped in on each side, divided by turreted buttresses. The roof will be of open timber, having a series of main spandril couples filled in with enriched arched tracery, resting on clustered moulded pillars. The whole interior walls of nave and aisles are to be of dressed warm-tinted freestone. The exterior walls are also to be finished with warm-tinted freestone dressings, and filled in with random rubble-work. The roofs are to be covered with green Westmoreland slates, and the windows to be filled with cathedral glass. The lighting throughout will be by electricity, and the heating by hot-water small-bore pipes.

Hertford.—A swimming-bath and gymnasium have just been added to the County College. The architect is Mr. R. W. Hobden, of 2, Circus-place, E.C., and the contractor Mr. J. Porter, Plantagenet Works, New Barnet. The building containing the bath is 48ft. long by 22ft. wide, and there is a dressing-room 19ft. by 8ft. The bath itself is 35ft. by 14ft., is 6ft. deep at one end and 3ft. at the other, and will contain 16,000 gallons. The sides of the bath are cased with white glazed bricks, and it has a granolithic bottom. The floor surrounding the bath is also of granolithic paving. A door leads into the gymnasium, which is 45ft. long and 22ft. wide, and paved with wood-block flooring.

Leith.—The Victoria Public Baths, which have been erected at Great Junction-street by the corporation of Leith, were formally opened by Provost Bennet the other day. The total cost has been about £12,000. The external elevation is of red sandstone, and is of a Classic character. The swimming-bath is 75ft. by 35ft., with a depth ranging from 7ft. to 3ft., and is flanked on each side with sixty dressing-boxes, with a spectators' gallery overhead. Trapeze, swing-rings, shoot, and diving-platform have been erected. Electric light is used throughout. Wave and spray arrangements have also been introduced, the former being utilised as a scummer, and the latter for ventilation produced by the spray of cold water cooling the atmosphere. Douche and foot baths, lavatory, office, and waiting-room, and seven plunge-baths have been provided. There is, besides, a billiard-room with accommodation for two tables. As a swimming-bath it holds from 500 to 600 spectators, and as a public hall it will hold from 1,000 to 1,500 people. The work has been executed under the superintendence, and from the designs, of Mr. George Simpson, town architect.

Liscard, Wallasey.—The foundation-stone of the new Central Hospital, Liscard, founded as a Jubilee Memorial, was laid on the 6th inst. The hospital as at present designed is to consist of one pavilion and 40 beds, divided equally between the male and female wards, with two small private wards of a couple of beds each. There will be an operating theatre, the passages and many of the walls being lined with glazed brick. The administrative block will suffice not only for the first pavilion, but also for the additional two which are ultimately to be built, for a total accommodation of about 140 beds. There will be a resident medical officer and a nursing staff of eight. Messrs. Maxwell and Tuke are the architects, and Messrs. J. Henshaw and Sons the builders. The outlay on the present section will be about £15,000.

Liverpool.—The new Post-office in Victoria-street was opened on Wednesday by the Duke of York. The building has a frontage to Victoria-street of 226ft., to St. Thomas-street of 254ft., to Stanley-street of 260ft., and has a yard comprising 103ft. square. The site covers nearly two acres of ground. In front of the second floor there are four figures representing England and Scotland and Ireland and Wales, the two pairs standing hand-in-hand. There are ten smaller figures, representing colonies. Below there are figures typifying Commerce and Industry, and Electricity and Engineering. The total cost of the site, including premises in Cumberland-street and Whitechapel, will be about £200,000, and another £100,000 or thereabouts will be required for building purposes, and for supplying fittings, engines, electric-light wires, and pneumatic tubes.. The building is considered absolutely proof against fire, very little woodwork being used, except in the way of furniture and fittings. The new buildings contain the following offices: Public, sorting, packet, parcel, and registered-letter offices; postmen's room, returned-letter branch, telephone-room, telegraph-instrument room, yard, bag and basket-room, and telegraph messengers' and delivery room. On the second floor are the scullery, kitchen, and carving, serving, and dining-rooms, the latter measuring 30ft. by 73ft., and having seats for 190 persons. The walls of these rooms, and of all the staircases and retiring-rooms, are of white glazed bricks, with dado of dark tiles. The inner vestibule and the postmaster's staircase, inside the west door in Victoria-street, are of Hopton Wood marble. The doors are of teak, and the public office counter of sabicu (a hard Cuban wood), the other fittings being of mahogany. The carving in front of the new office was designed and executed by Mr. Edwin Owen Griffith, of 77, Kitchen-street, Liverpool. Mr. Henry Tanner, chief surveyor of H.M. Office of Works, was the architect; and the principal contractors were—for buildings, Messrs. Thornton and Sons, Wellington-road, Toxteth Park, Liverpool; glazed bricks, Mr. Dennis, of Ruabon; sanitary appliances, Messrs. Doulton and Co., of London. The Post-office was illustrated in the Building News for Oct. 27, Nov. 24, and Dec. 15, 1895.

Mullion.—The Poldhu Hotel was opened on Tuesday in last week. Perched on the cliff, the hotel is built of hard local stone, with brick division walls, granite quoins, and dressings of yellow brick, which also form the jambs and heads of the doors and windows. The roofs are covered slate, and the walls are stuccoed on the exterior. On the ground floor the main entrance faces south. It gives access to a front hall, about 26ft. by 18ft., and separated from it by an arcade of three arches, is the main staircase. In continuation of the entrance-hall is a lounge-hall about 25ft. by 18ft. Right and left of the main hall branch off corridors leading on the left to two private sitting-rooms, each 13ft. 6in. by 18ft., the drawing-room, 25ft. by 18ft., a reading and two smaller rooms. Off the corridor on the right lies the dining-room, 48ft. long, billiard and smoking rooms, and manager's private room. This corridor leads to the domestic offices. On the first and second floors are private sitting and bedrooms, bathrooms, &c. At a distance from the house is a block containing stables, accommodation for cycles, and a recreation-room. The plumbers' work and all sanitary arrangements have been put in by Messrs. Beavan and Sons, Gloucester and London. The lift is by Messrs. Clark, Bunnett, and Co., of London. The grates and chimney-pieces are in part the manufacture of the Carron Co., and in part the make of the Coalbrookdale Iron Co. The buildings have been designed by Mr. Walter B. Wood, A.R.I.B.A., of 12, Queen-street, Gloucester, and the building operations have been carried out by Messrs. Henry George and Sons and Mr. J. H. Matthews, of Mullion.

New Zealand.—Additions of considerable size are being made to the Parliamentary Buildings in Wellington, N.Z., from designs by Mr. Thomas Turnbull, F.R.I.B.A. The style is Free Gothic, and is being executed in Portland cement stucco. The same gentleman has prepared a design for the new head office building for the Bank of New Zealand. The Australian Mutual Provident Society have just completed their premises in Wellington at a cost of about £19,000. The architects are Messrs. Clere, F.R.I.B.A., Fitzgerald, and Richmond, Wellington, N.Z. This firm have in hand the Victoria Operating Theatre in connection with the Government Hospital, additions to the N.Z. Electrical Syndicate's Building, churches at Eketahuna and Ngamatapouri, and have just finished those at Fowlers and Ashurst, all in the diocese of Wellington. They are also engaged on the plans of a R.C. Church at Kaikoura in the South Island. Mr. Petre, of Dunedin, has prepared the plans for the new R.C. Church in Wellington, taking the place of the old wooden one which was destroyed by fire last November.

Norwich.—At St. John's Timberhill, Norwich, a new screen dividing off a portion of the south aisle to serve as a Lady-chapel was unveiled last week. Of solid oak, it is Perpendicular in style, and is divided into five bays, two on either side of the main opening, which is closed by iron gates. Overhead is a carved canopy with dropped tracery, having carved cuspings and crockets running to a finial which stands below a heavily-moulded and carved cornice, this in turn being surmounted by a cresting of a pomegranate design, the fruit carved in varying patterns. In the top of each bay the tracery is deeply cut with counter mouldings and cuspings, animals and birds forming the subject. The jambs and mullions are deeply moulded, with a buttress standing on a moulded base, carrying a double table set-off. A circular shaft runs from each, having a carved base surmounted by a finial. The bottom panels, intended as painted panels, are also headed with tracery. The design, which is the work of Mr. A. Weston, of Norwich, has been executed by Mr. C. W. Brown, of William-street, Norwich. A carved oak rood-screen was erected in the same church nine years ago.

Swanley, Kent.—At the last meeting of the Metropolitan Asylums Board, a report was presented from the works committee submitting the finished drawings, with the architects' descriptive report and approximate estimate, of the cost of the school for ophthalmitic children which the managers propose to erect at Swanley. It was stated that the accommodation to be provided at the school will be in all respects similar to that shown on the plans at the High Wood School at Brentwood, which the managers approved and adopted at their last meeting—viz., for 360 children, with a total staff (exclusive of school teachers) of 80, of whom seven will be non-resident. The architects (Messrs. Newman and Newman) estimated the cost of the buildings at £110,524—an amount somewhat higher than the estimate (£106,600) for the schools at Brentwood. The children will be housed in cottages containing twelve beds each, and the cottages will be built in pairs and arranged in five groups, so that three pairs of cottages will form one group. Each group will therefore accommodate 72 children, and the whole school 360 children. The children's committee had estimated the "cost of working" the establishment at £13,165 per annum, or between £36 and £37 per child per annum. After some discussion, the plans, descriptive report, and approximate estimate were approved and forwarded to the Local Government Board for their formal sanction.

Tetbury.—Messrs. Waller and Son, diocesan architects, Gloucester, have made a report to the vicar and churchwardens of Tetbury, with reference to the proposed restoration or rebuilding of the parish church. The edifice, with the exception of the tower and spire, was erected in 1764 and succeeding years; the tower and spire were rebuilt, by the munificence of Mr. Hamilton-Yateman, in 1891. Messrs. Waller have a poor opinion of the present nave and chancel. "From an architectural or archæological point of view," they say, "the church and fittings are such as might be expected in a building erected at a time when the principles of Gothic architecture were at best very imperfectly understood," and owing to the exceptional extent of the decay in the stonework at the present time, there is great difficulty in arriving at an estimate of the cost of restoration works. Approximately, however, they name £5,000, while they think a new church might be erected at from £10 to £20 per sitting. The parishioners have yet to meet to consider what can be done.

Wellington, Salop.—The work of restoring and renovating the parish church has been in progress for several months, and the reopening services took place the other day. The structural alterations consist of the formation of a chancel, by removing the eastward bays of the gallery on either side, and using the space so formed on the north side as an organ chamber, and that on the south side as a morning chapel. The floor of the new chancel is raised two steps above the level of the old one, and the east window has been raised in proportion. The pitch of the gallery has also been altered, so that a view of the chancel and pulpit may be obtained from any position. The decorative alterations include casing the old iron columns with marble, those on the ground floor being of the Roman Doric order, those in the gallery of the Corinthian, the formation of arches in the nave above the gallery between the columns, and the addition of a dentilled and modillioned cornice supporting ribs which divide the ceiling into panels. Between the nave and chancel is erected an oak screen, and a similar screen separates the morning chapel on the south side from the chancel. This is made of oak which was formerly in the old church at Wellington. The plans for the work were drawn by Mr. C. R. Dalgleish, architect, of Wellington and Shrewsbury, and approved by Sir Arthur Blomfield. The money spent on the church, including special gifts, amounts to about £5,000. Among the gifts to the church are a pulpit of statuary marble, with columns of dove-coloured marble and bases and steps of Hopton Wood stone, a brass lectern of Classical design, enriched with a number of precious stones, and a font-cover and ewer. The organ is being rebuilt and enlarged by Messrs. Bevington.

A subscription portrait of the late Mr. J. J. Colman is about to be painted for presentation to the city of Norwich, so long represented by him in Parliament. The commission has been given to Mr. Herkomer, R.A , and the picture will eventually be hung in St. Andrew's Hall, which already contains a valuable collection of local portraits.

Princess Henry of Battenberg, on behalf of the Queen, laid the foundation-stone on Friday of a new church which is to be erected to the memory of the late Dr. Vaughan, Dean of Llandaff and Master of the Temple. The site of the new building, which will be known at Christ Church, is in Mortimer-road, Kensal-rise. The building will be of brickwork, with stone columns and facings, and will seat 750 people. When completed the church will consist of nave and north and south aisles of five bays, and chancel. At the south-west angle will be a tower capped by a spire. in all 175ft. in height. The cost, including the first stage of the tower, will be £8,980, and of this sum there still remains £1,900 to be raised. Mr. J. E. K. Cutts is the architect.

Engineering Notes.

Dunston, Gateshead.—Since the contractors began with the extension of Dunston Staiths and the forming of a tidal basin in January last the progress made with the work has been rapid. Half a million cubic yards of earth is to be excavated on the inside of the jetty for the forming of the tidal basin, this being taken from an area of nearly five acres. In this section of the contract, very many thousands of cubic yards have been cleared away up to the present, each of the two steam navvies loading the waggons being capable of removing 800 cubic yards a day. The excavation of the basin is being worked down to from 30ft. to 35ft. depth, which distance will be, when finished, 18ft. below the level of low water, so that steamships may be berthed and then loaded from spouts on the south side of the staiths. The river wall will be 945ft. long, by 40ft. deep, and at present the business of making a trench in connection with this wall is being rapidly pressed forward. In the construction of the wall nearly 20,000 cubic yards of concrete will have to be utilised. The work of framing the wood-work for the staiths is also going forward with despatch, and in this part of the contract something like a quarter of a million cubic feet of heavy timber will be fixed in position. This is mainly American pitch-pine, which has undergone the process of Haskinising to render the wood more serviceable and economical. Mr. George C. Thompson is the agent and engineer for Mr. H. M. Nowell, of Leeds, and is in command of the work.

Light Railways.—A public inquiry having been held at Cheltenham by the Light Railway Commissioners into an application for an order to authorise a light railway to be laid through the town of Cheltenham and the village of Prestbury up to the top of Cleeve Hill, the Commissioners have decided to authorise that portion of the railway from Cheltenham to Cleeve Hill, rejecting the greater part of the line within the town of Cheltenham. At a public inquiry at Aldershot the Commissioners considered an application for a light railway from Farnborough Station to Aldershot, with a branch to the North Camp Station. The War Office raised objections to the occupation by the railway of any part of those roads which are used for the passage of troops, and the decision of the Commissioners was reserved. At a public inquiry at Wolverhampton the Commissioners considered an application for a light railway from Easington to Willenhall, forming junctions with the Midland and London and North-Western Railways. The application met with opposition from the London and North-Western Railway Company, but after hearing the evidence the Commissioners decided that it should be granted.

Rock Ferry.—The new pier at Rock Ferry, erected by the corporation of Birkenhead, was recently opened. The corporation purchased Rock Ferry Slip and New Ferry on September 17, 1897, for the sum of £20,000, which included the passenger boat then running. The total cost of both ferries and steamers will be about £60,000. The Rock Ferry Pier is erected on the northerly side of the old stone slip, and is 791ft. 6in. long and 18ft. wide. The girders of the pier are constructed of steel supported on cast-iron columns 14in. diameter. The approach bridge, between the pier and stage, is 160ft. long, 10ft. wide, and is hinged at the top and bottom to rise and fall with the tide. The stage is 150ft. long by 32ft. wide, and is supported on ten detachable pontoons. The contract price was £14,785 7s. 5d. The old pay office buildings have been taken down and new buildings erected containing four turnstiles and season ticket-holders' gate, the contractor for this work being Mr. Richard Allen, of Birkenhead, and the amount of the contract £798 10s. Mr. David Barry was the resident inspector of the works. The works have been carried out under the directions of Sir John Wolfe Barry, K.C.B , and Mr. Charles Brownridge, C.E., borough engineer and surveyor of Birkenhead.

St. Helens.—The Board of Trade inspection of the sections of the St. Helens and District Tramways, which have been fitted up for electric traction by the corporation, was made on Wednesday. The sections completed up to the present are those to Prescot and Denton's Green, and the work upon other lines is being rapidly proceeded with. Under the powers recently obtained from Parliament the St. Helens Corporation are now urging forward the extensions of the tramway system at Haydock, at Parr, at Prescot, and at Peasley Cross, and St. Helens Junction. A commencement of the work at Haydock was made on Monday, the contract for that portion having been secured by Messrs. Hughes and Stirling, of Liverpool. Messrs. R. W. and A. Heaton, of St. Helens, have obtained contracts for the work on the other sections.

Troon, N.B.—A new graving dock was opened last week. The new dock lies to the east of the old one, with the yard of the Ailsa Shipbuilding Company intervening, and it has a total length on the floor level of 360ft., or 85ft. more than the old one, while its breadth is 50ft. at the floor and 56ft. 3in. at the sill level, the entrance being 48ft. wide, with a depth of water on the sill of 16ft. 6in. Mr. George Lawson, Blairbeth, Rutherglen, was the contractor for the dock and gates; Messrs. Drysdale and Co., London-road, Glasgow, provided the pumping machinery and boilers; and the whole of the works were carried out to the plans and under the superintendence of Messrs. M'Taggart, Cowan, and Barker, civil engineers, Glasgow.

CHIPS.

The Goole Urban District Council have instructed Mr. E. J. Silcock, C.E., of Leeds, to devise them a scheme of sewerage and sewage disposal, this being necessitated by the great expansion of the town on the east side of the River Ouse, in the parish of Barlby.

The new Roman Catholic church of St. Brigid has been dedicated at Clonakenny, near Roscrea. It is Romanesque in style, freely treated, and consists of a nave 80ft. by 30ft., and short chancel. Mr. W. G. Doolin, of Dublin, was the architect, and Mr. J. Sisk, of Cork, the builder.

Teignmouth Wesleyan church and schools have been reopened after alterations and restoration. A new system of lighting and ventilation has been carried out, and the place redecorated. The building work has been done by Mr. Smaridge, builder, of Paignton, under the direction of Mr. James Crocker, F.R.I.B.A., of Exeter.

It is proposed to restore the fine 14th-century parish church of Chatteris, Cambs. in accordance with plans prepared by Mr. W. M. Fawcett, F.S.A., of Cambridge, whose estimate of the cost is £3,880.

The new swimming-bath and Victoria Park in Plymouth-road, Buckfastleigh, were opened on Saturday. The bath is 70ft. by 35ft., and is graduated in depth from 4ft. to 6ft. 6in. Messrs. Arscott and Jackson were the contractors.

Road improvements in Connecticut have been given an impetus by the appropriation of 350,000dol. for State aid during the next two years. Commissioner MacDonald has been reappointed for another term of office, and his salary has been increased to 3,000dol. a year.

The first portion of St. John's Free Church, Tunbridge Wells, was opened last week. This is the lecture-hall, 50ft. by 34ft., vestry, and classrooms, and over these the church proper will be built. It is of red bricks with stone dressings, and the cost has been for building and site £4,000; the honorary architect is Mr. M. Caley, one of the deacons of the church.

A municipal electric supply scheme is to be carried out at Ilfracombe, the council having adopted the suggestions of their consulting engineer, Mr. W. H. Trentham. The estimated cost of the initial equipment is £14,700, and application is to be made for power to raise the money.

The winter gardens, Southport, comprising opera house, pavilion, circus, conservatory, aquarium, and other properties, have been sold by the representatives of the old company to Mr. Maxwell, of Messers. Maxwell and Tuke, architects, Manchester, for £141,000, with interest of 4 per cent. on the share capital since the contract was entered into nearly two years ago. Plans have been prepared for very considerable developments.

The new granary at Avonmouth Dock, which is being erected for the Bristol Docks Committee by Mr. C. A. Hayes, contractor, of Bristol, was used for the reception of cargo for the first time on Friday. The building, when completed, will have a capacity of 70,000 quarters, and will cost some £65,000.

The Society for the Protection of Ancient Buildings are raising the usual outcry against the proposed restoration and completion of the Abbey Church of Hexham (for which the plans of Mr. C. C. Hodge, of that town, have been adopted), and are begging the public to evince their antipathy to the proposals by withholding subscriptions.

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Our Illustrations.

NEW CLARIDGE'S HOTEL.

THIS hotel is built in the style of the English Renaissance freely treated. The exterior walls are of red brick, of which a considerable portion is rubbed and gauged with dressings of red Mansfield stone. The entrance is wholly of this stone and dark Shap granite. A special feature is made of the long ranges of cast-iron balconies. The roof is covered with green Westmoreland slates. The entire construction of walls, partitions, staircases, floors, and roofs is of fire-resisting material. All casements throughout the building are of mahogany, and the staircases marble. The building is arranged on plan with a central square courtyard, lined with tinted glazed bricks, and a wide corridor runs completely round the building, the centre of which is occupied on the ground floor by a winter garden opposite the main entrance. The public rooms consist of a *salle-à-manger* restaurant, billiard-room, smoking, drawing, and reading-rooms arranged around the winter garden. On the floors above the rooms are in suites, consisting of sitting, bed, dressing, and bath-rooms, each suite having its own hall and connecting corridors, all arranged so that any number of rooms can be added to a suite as required. In addition, there is on each floor a large dining-room, which may be used privately or in connection with any suite. The kitchens are in the basement. The service includes all the most modern appliances for the comfort and convenience of visitors. Electric passenger lifts and luggage and service lifts have been provided, and there is a fire staircase from the top floor to the street in rear. On the first floor at the Brook-street corner there is a Royal suite comprising a set of rooms extending along the Brook-street and Davies-street fronts, and having a separate entrance in Brook-street. A separate entrance in Davies-street gives access to the *salle-à-manger* and restaurant. Another entrance in Brook-street leads direct to one of the lifts and staircases, obviating the necessity of going through the more public parts of the hotel. The entire building is warmed by hot water and lighted by electricity. The accompanying drawing has been lent us by the architect of the fabric, Mr. C. W. Stephens. Some interior work was designed by Mr. Ernest George.

"FAIRY HILL," WEYBRIDGE.

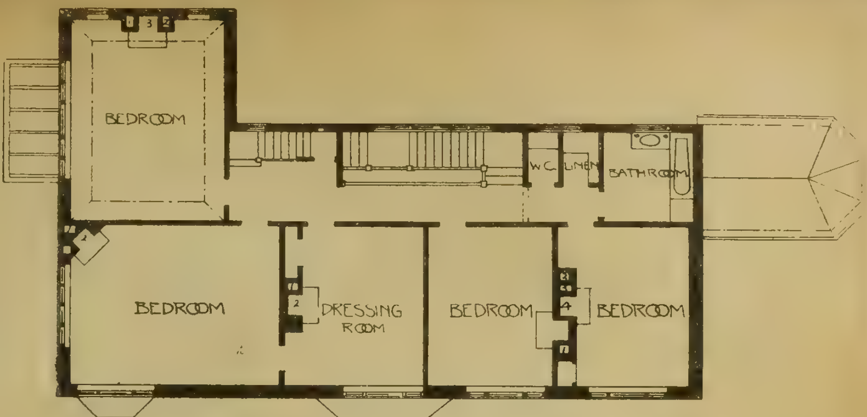
THIS illustration is of a house erected at Weybridge, from designs by Messrs. Niven and Wigglesworth. The walls are of red brick and the roof tiled.

IPSWICH NEW WORKHOUSE.

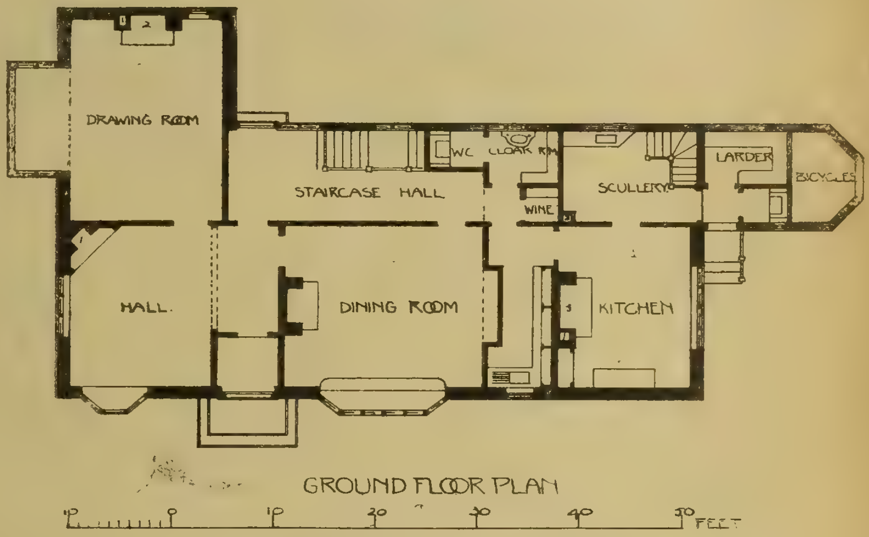
(FOR description, see page 62.)

COTTAGES, PORT SUNLIGHT.

THE walls are of brick, the lower portions and chimneys being faced with Edwards's red Ruabon, 9in. by 2¼in., having thick white mortar weathered joints, and the upper portions finished in cement pebble-dashing, whitewashed. The roofs are covered with Edwards's brown roofing tiles. The external woodwork is painted a light purply-grey. The houses have been built by Messrs. Beckett and Co., of Hartford, under the superintendence of the architect, Mr. Jonathan Simpson, of Bolton.



FIRST FLOOR PLAN



GROUND FLOOR PLAN

FAIRY HILL, WEYBRIDGE.

NEW DINING ROOM, XXIII. HILL STREET.

THIS house has lately been remodelled for the Earl of Crewe, and the dining-room illustrated in this issue forms part of the new additions. The height of the ends of the room was limited owing to adjoining lights, so the central portion was taken up somewhat higher, with elliptical sidelights, the light obtainable from the lower windows not being very great. The room is panelled throughout, with silk filling to the upper panels. Messrs. Johnson and Co. were the contractors for the whole of the works, part of the dining-room being done by Mr. Giles. Messrs. J. T. Wimperis and Arber were the architects.

THE GORDON MEMORIAL COLLEGE, KHARTOUM.

A FORTNIGHT since we gave the plans of this great work, which Lord Kitchener is now executing at Khartoum from the designs of M. Fabricius Bey, the architect to the Khedive. We printed at the same time some particulars of the undertaking, and also published with the detailed plans a general block plan of the whole scheme. To-day, as promised, we are enabled, by the courtesy of the architect, to give a reproduction of his original elevation, showing the main front designed in a somewhat elaborated style of Oriental character. Owing to the great cost of executing work of this kind at Khartoum, Lord Kitchener has been obliged to modify the façades; the smaller drawing illustrating the whole front, and given with the first design herewith, shows the College now in progress of building. The materials are local red bricks and stone with black brick bands.

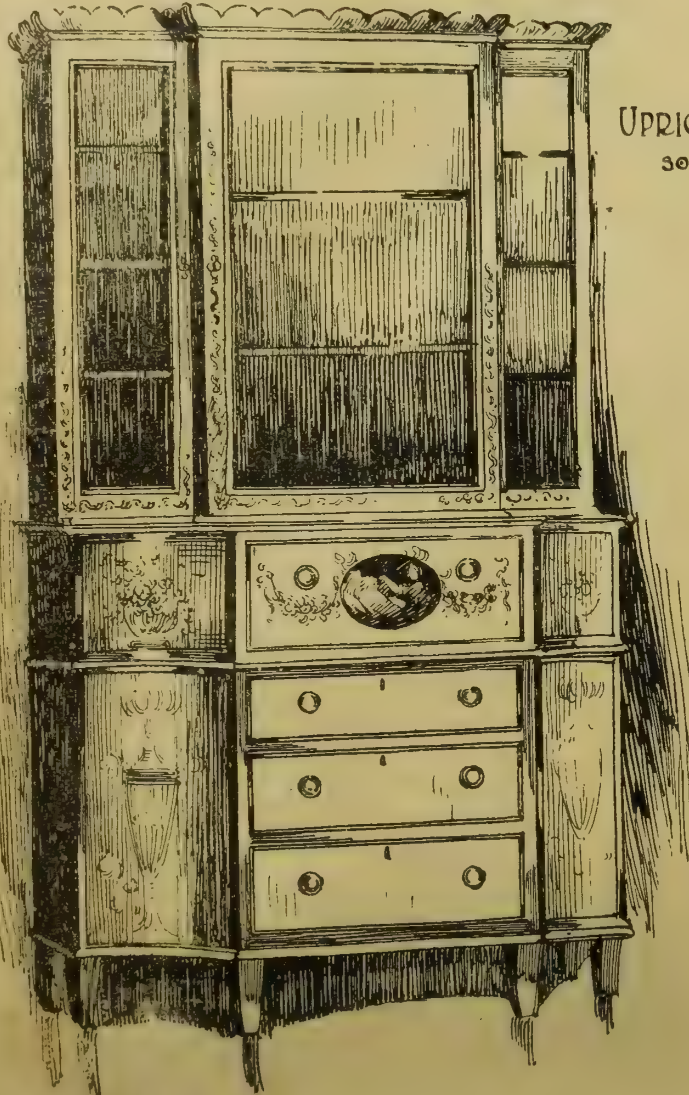
FURNITURE FROM THE COLLECTION OF THE RIGHT HON. LORD HENRY THYNNE.

ONE of the most important furniture sales of the season took place in Messrs. Christie, Manson, and Wood's sale-rooms last month—viz., the disposal of the collection of Old English marqueterie and French furniture, the property of the Right Hon. Lord Henry Thynne. The collection comprised some rare specimens, for which good prices were obtained. Our sketches depict an upright winged Cabinet, of satinwood, with inlaid kingwood borders, with a sliding drawer in the centre intended to be fitted as a secretaire; three drawers beneath, and a drawer and cupboard on either side with concave fronts. Three glazed doors above inclose shelves. The whole piece is beautifully inlaid with baskets and festoons of flowers, ribbons, vases, arabesques, &c., and painted with a nymph in a landscape in oval medallion, escalloped border at the top, 82in. high, 52in. wide. This cabinet was sold for 440 guineas. A pair of old English marqueterie chairs, with open fan-shaped backs, of satinwood, inlaid with branches of foliage and flowers in coloured woods, on square-shaped legs similarly inlaid, fetched 50 guineas; whilst the other upright Secretaire, also with inlaid satin, hare, and other woods, splayed at the angles, and with fall-down front, drawer above, and folding-doors beneath, inlaid with knots of ribbon and cords with tassels, from which depend square-shaped panels of black and gold lacquer, inlaid with flowers and rocks in engraved mother-o'-pearl, 57in. high, 37in. wide, was sold for 185 guineas. At a later date we hope to give a few more specimens of this most interesting collection.

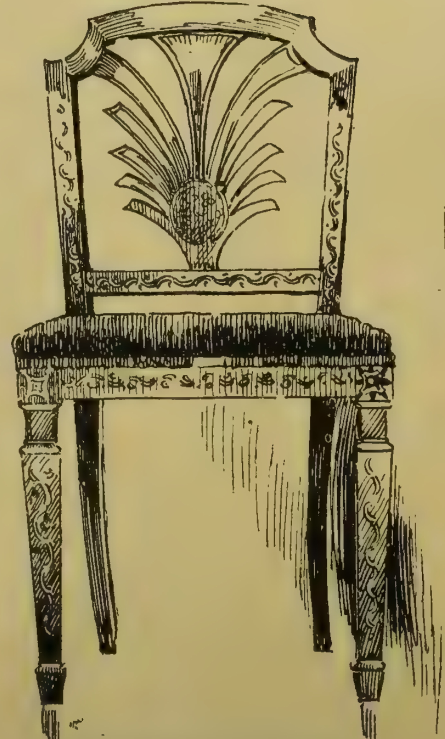
HOUSE, WALTON-ON-THAMES.

THIS house was recently built at Walton-on-Thames. The walls are of red brick, the upper story tile-hung and cemented. Messrs. Niven and Wigglesworth were the architects.

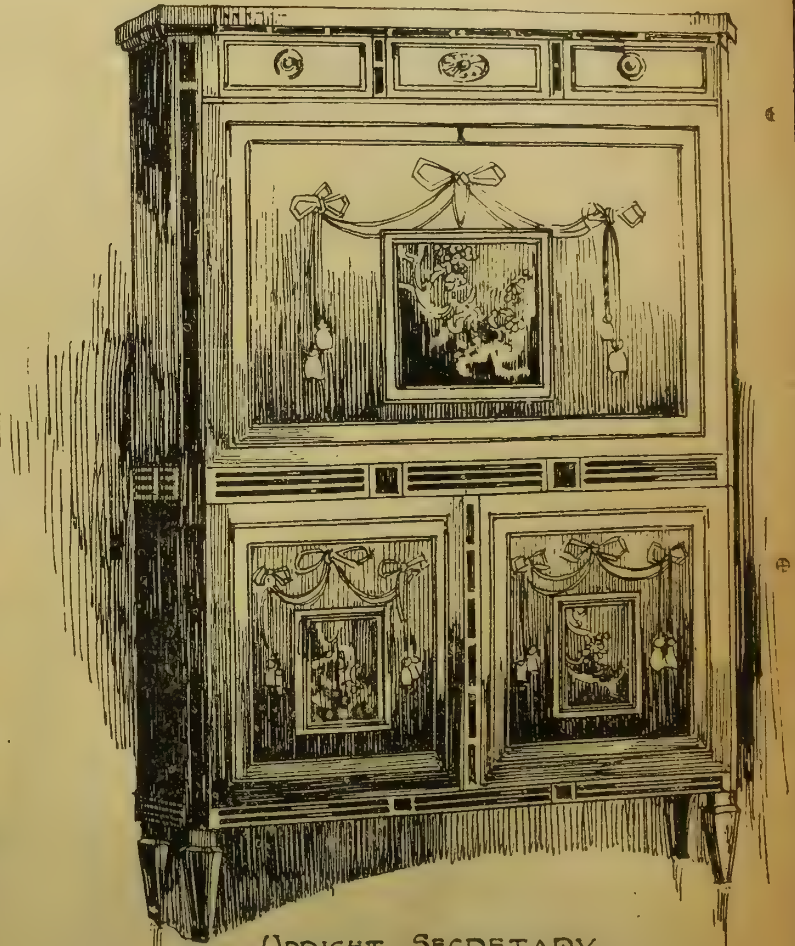
FURNITURE FROM THE COLLECTION OF THE RIGHT HON: LORD HENRY THYNNE RECENTLY SOLD BY MESSRS CHRISTIE



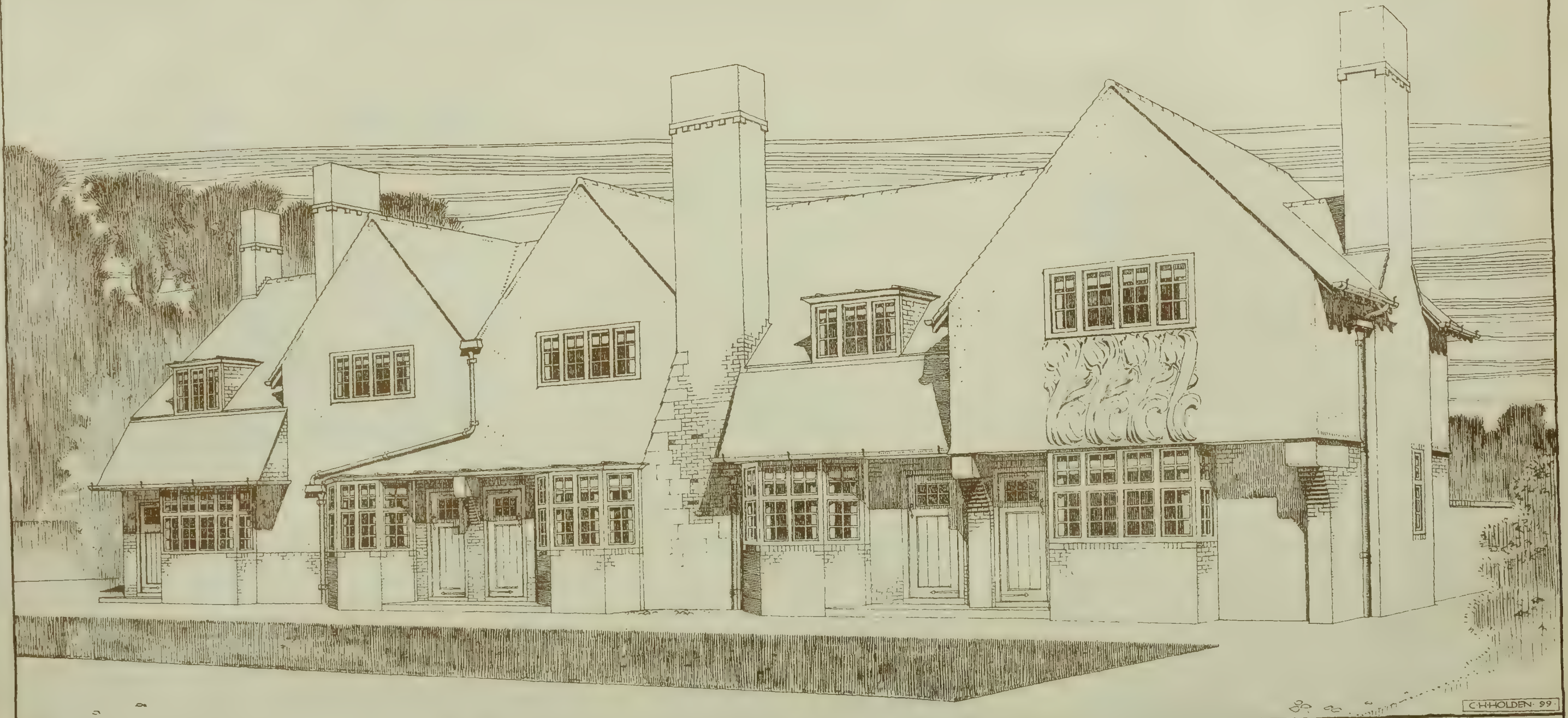
UPRIGHT WINGED CABINET
SOLD FOR 440 GUINS



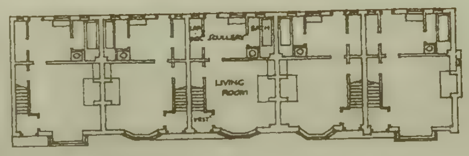
· OLD ENGLISH CHAIR ·
SOLD FOR 25 GUINS



UPRIGHT SECRETARY
SOLD FOR 185 GUINS

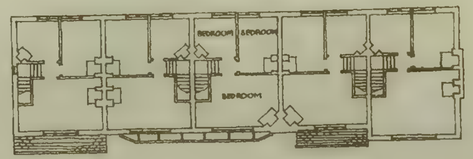


GROUND PLAN ·



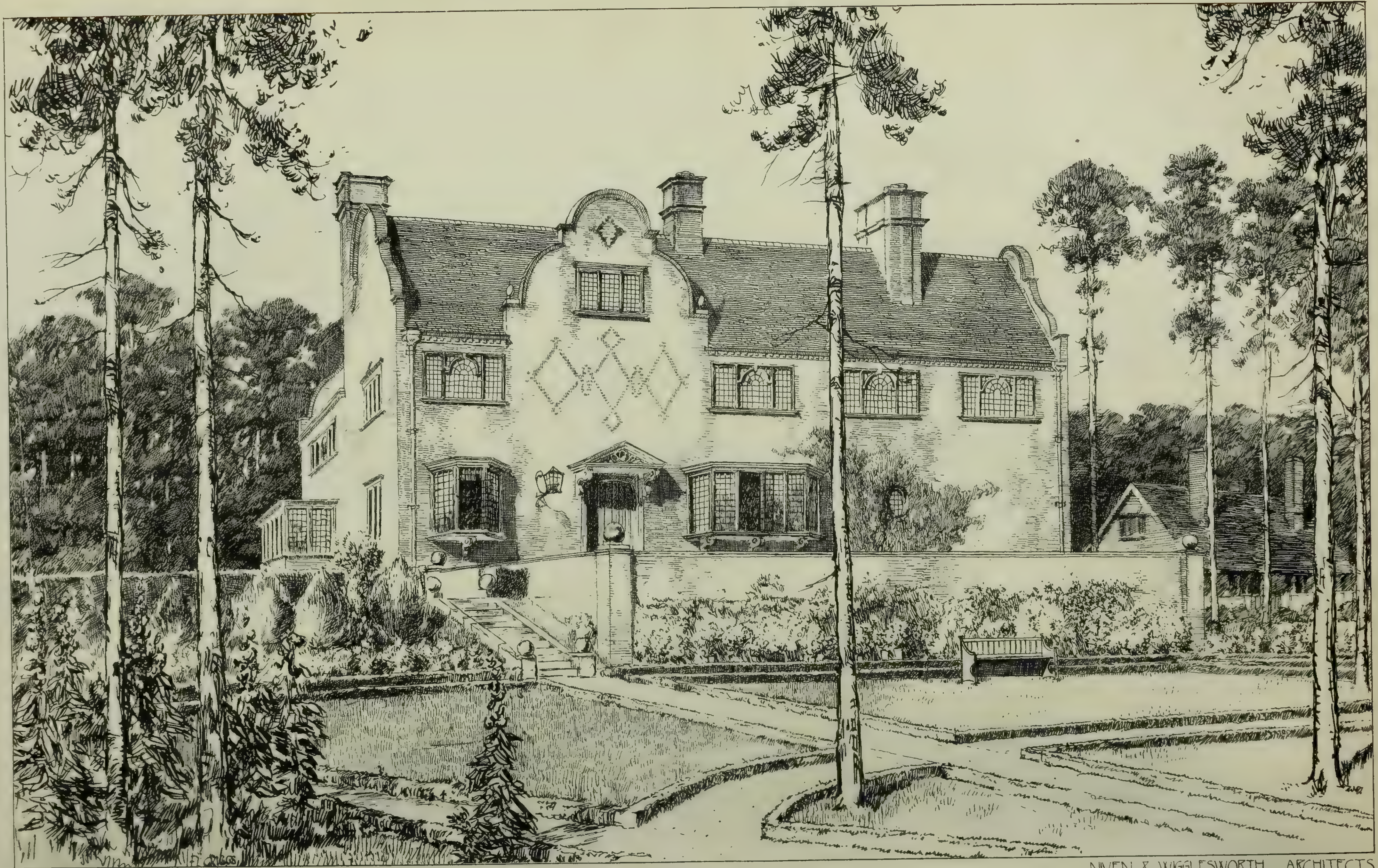
COTTAGES AT PORT SUNLIGHT.

JONᴺ SIMPSON.
ARCHITECT.
·BOLTON·



UPPER PLAN ·

Photo-Lithographed & Printed by James Akerman, 6 Queen Square W C



"FAIRYHILL" WEYBRIDGE

NIVEN & WIGGLESWORTH ARCHITECTS

WALTON ON THAMES

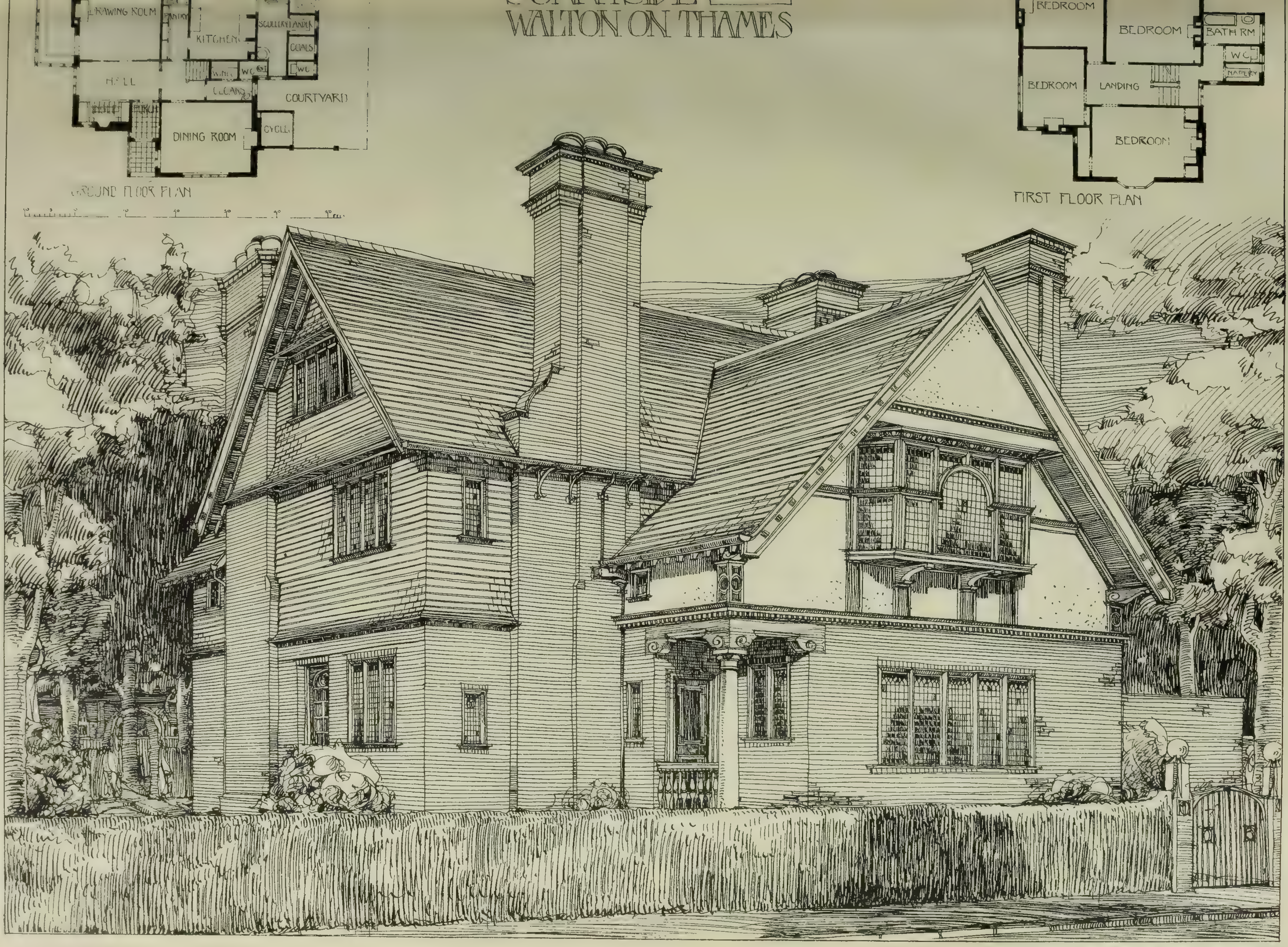
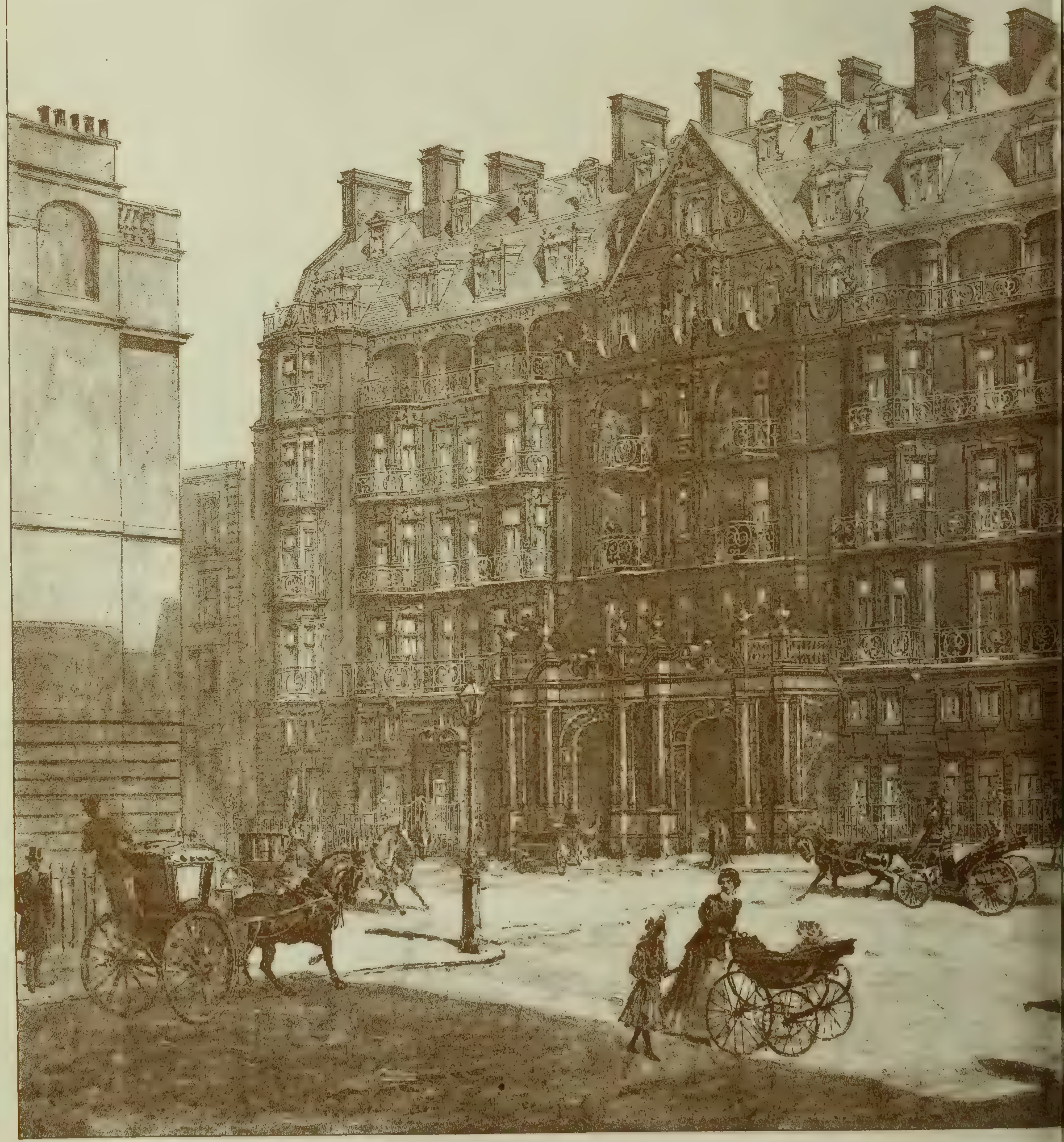
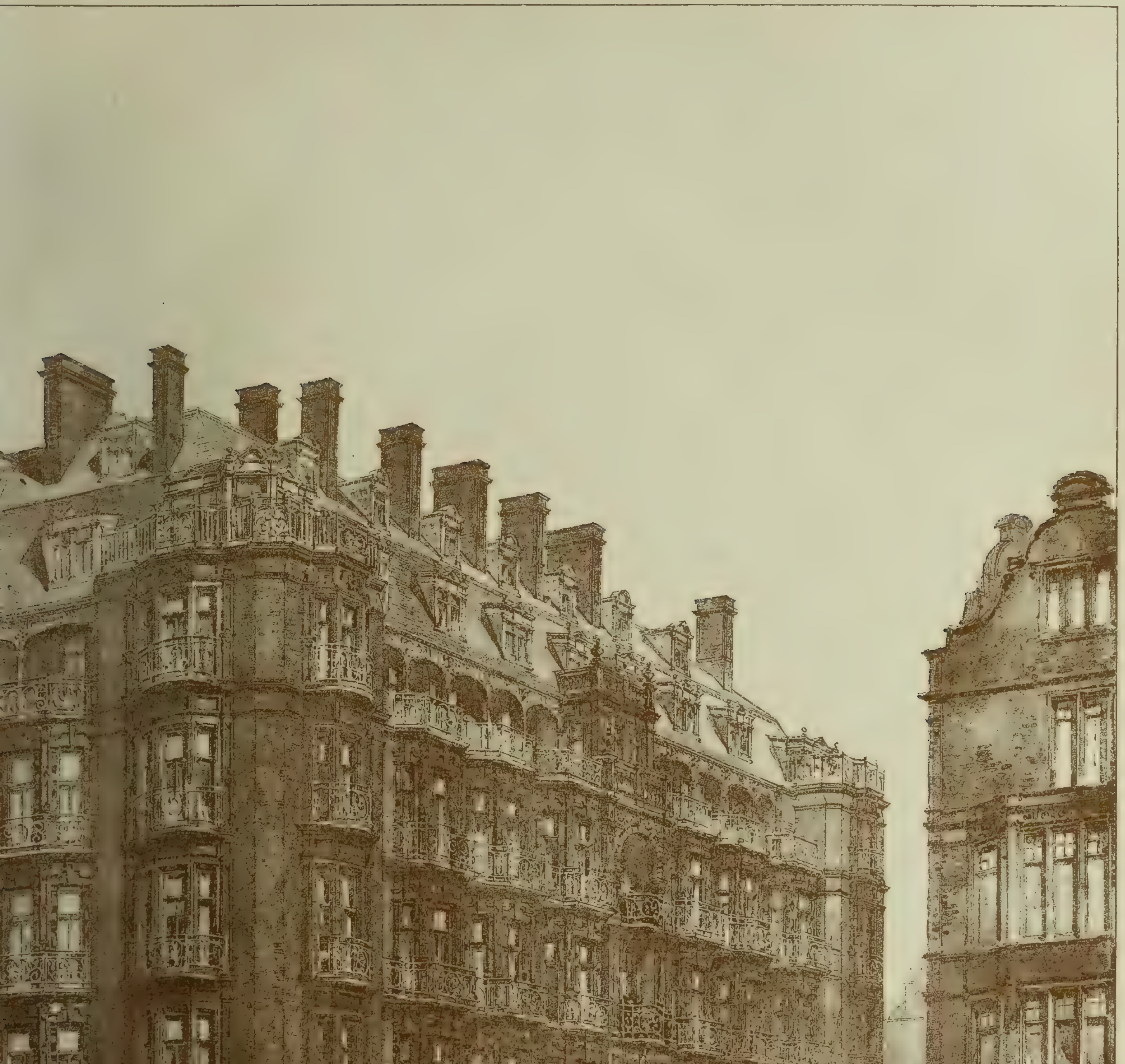


Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

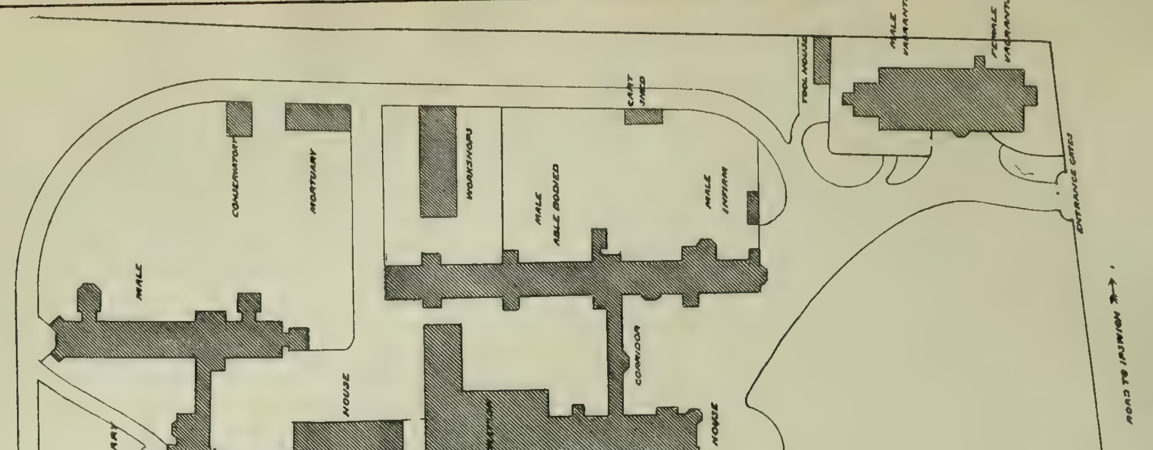
·Claridges Hotel·

C W·Stephens Archt

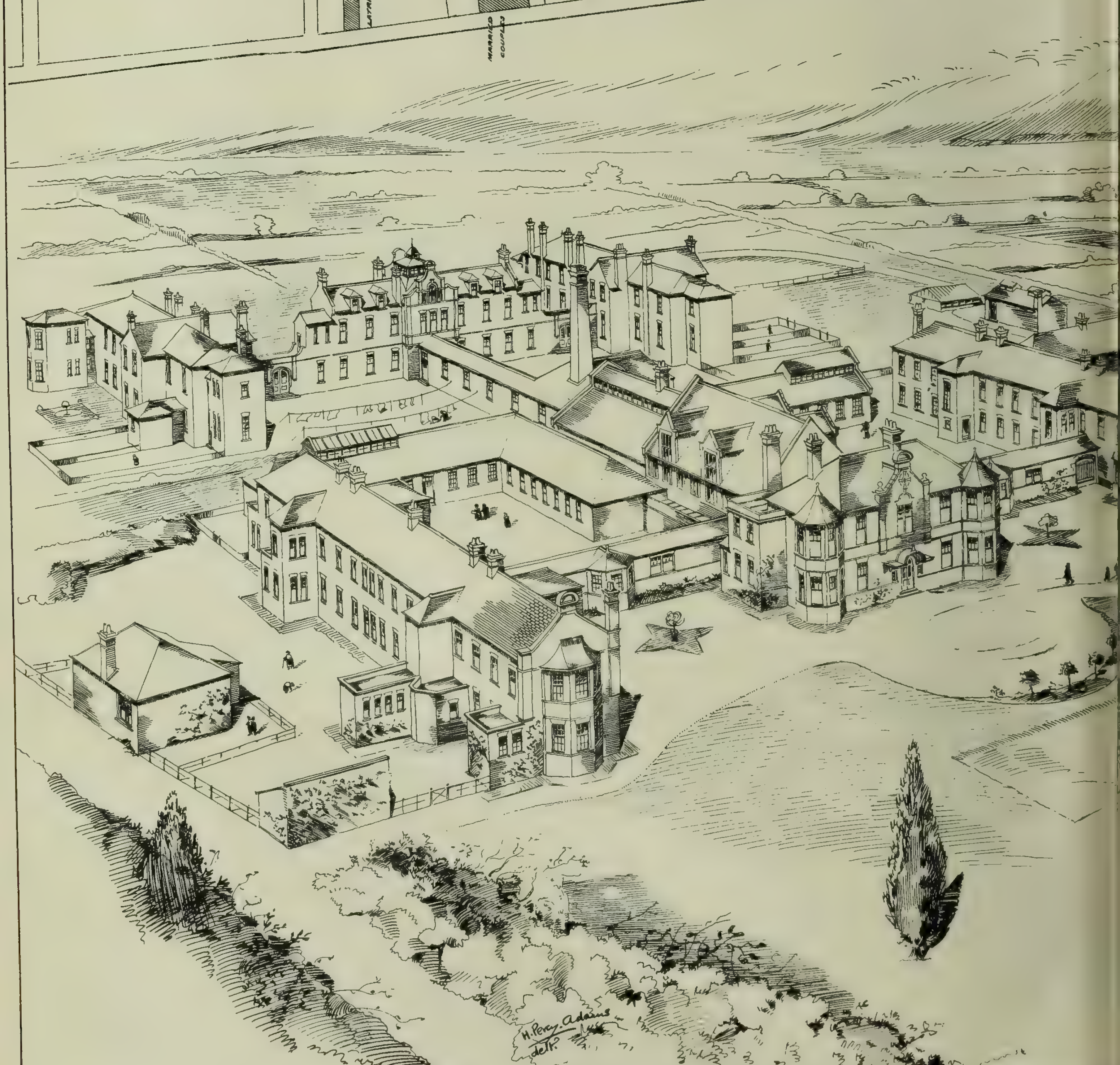


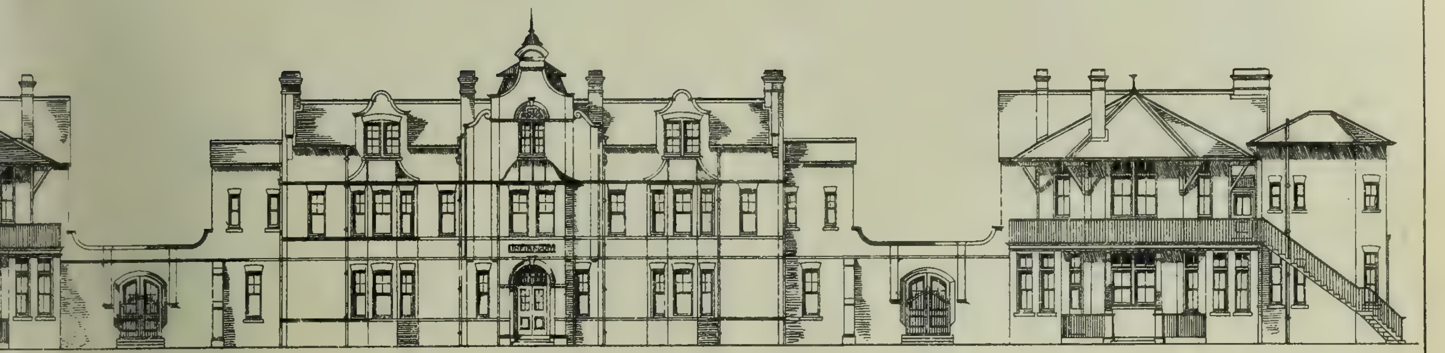


"PHOTO-TINT," by James Akerman 6 Queen Square London W.


MALE VAGRANTS
FEMALE VAGRANTS
TOOL HOUSE
CART SHED
CONSERVATORY
MORTUARY
WORKSHOPS
MALE ABLE BODIED
MALE INFIRM
ENTRANCE GATES
MALE
ROAD TO IPSWICH
CORRIDOR
HOUSE
INFIRMARY
BOILER
ADMINISTRATION
MASTERS HOUSE
N
LAUNDRY
CORRIDOR
FEMALE
FEMALE ABLE BODIED
FEMALE INFIRM
LATRINES
MARRIED COUPLES
ROADWAY TO FARM
GATES

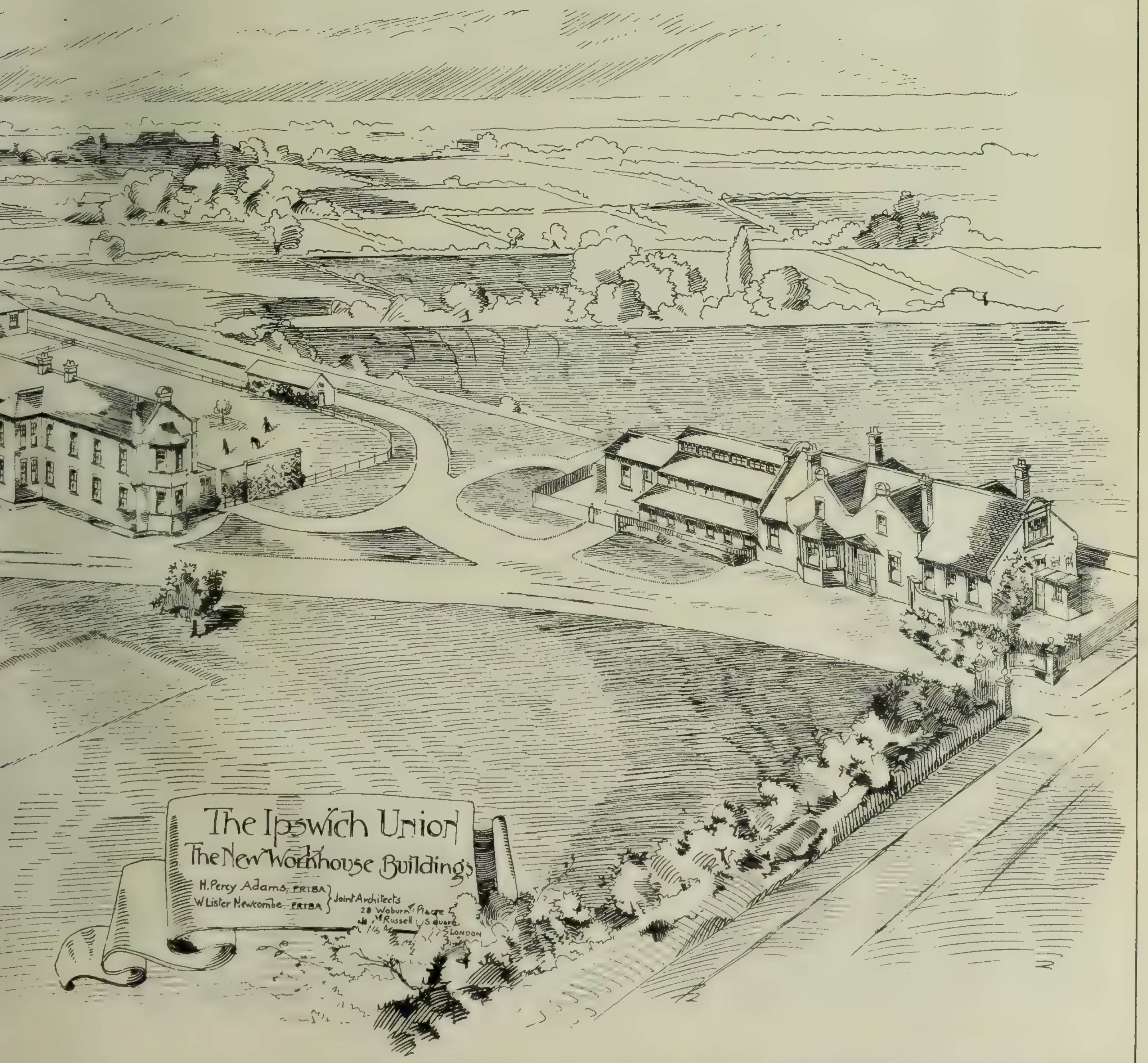
- MALE SI


H. Percy Adams delt.



- FRONT ELEVATION OF INFIRMARY [FACING SOUTH] -

- FEMALE SIDE -


The Ipswich Union
The New Workhouse Buildings
H. Percy Adams. F.R.I.B.A.
W Lister Newcombe. F.R.I.B.A.
Joint Architects
28 Woburn Place
Russell Square
LONDON

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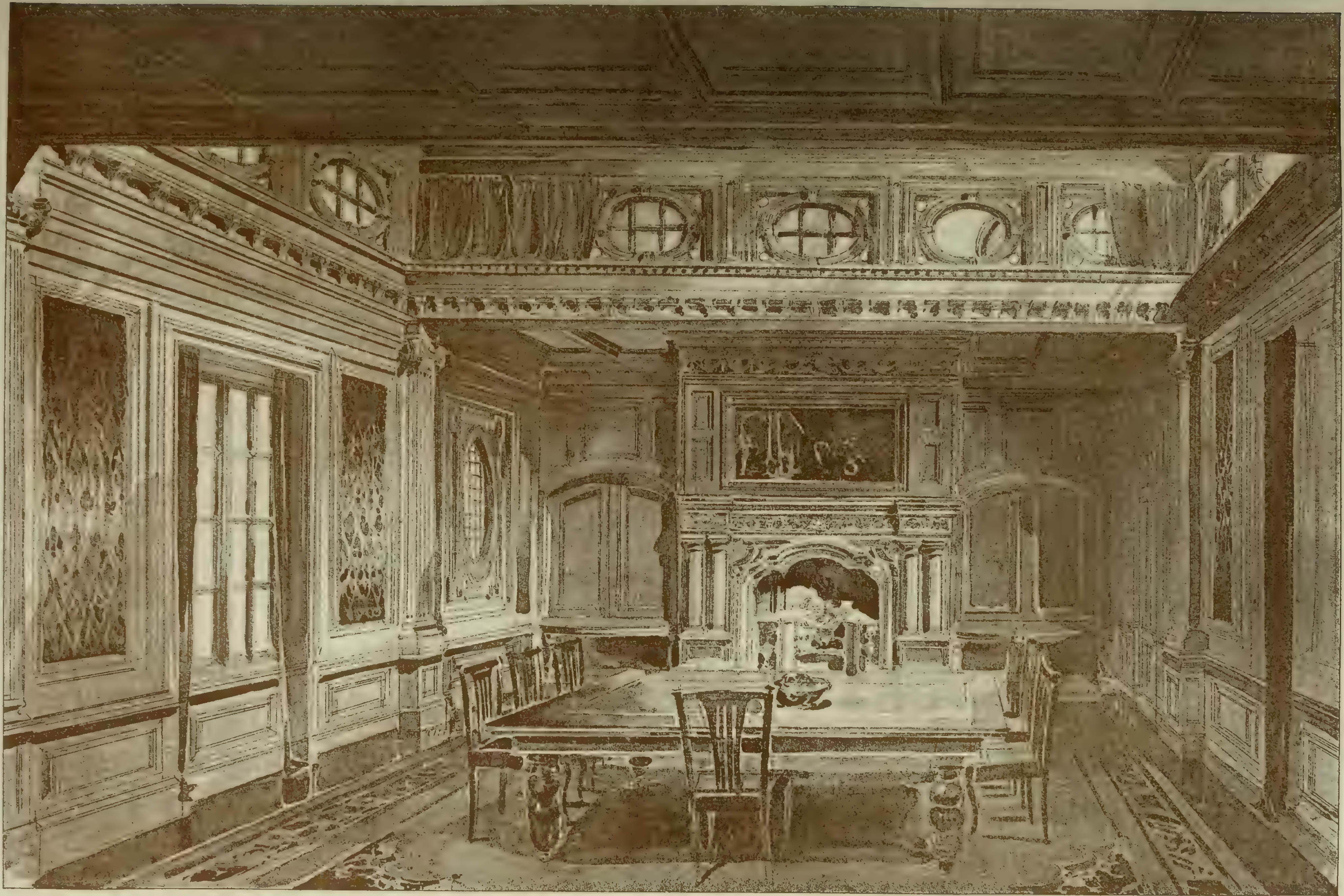

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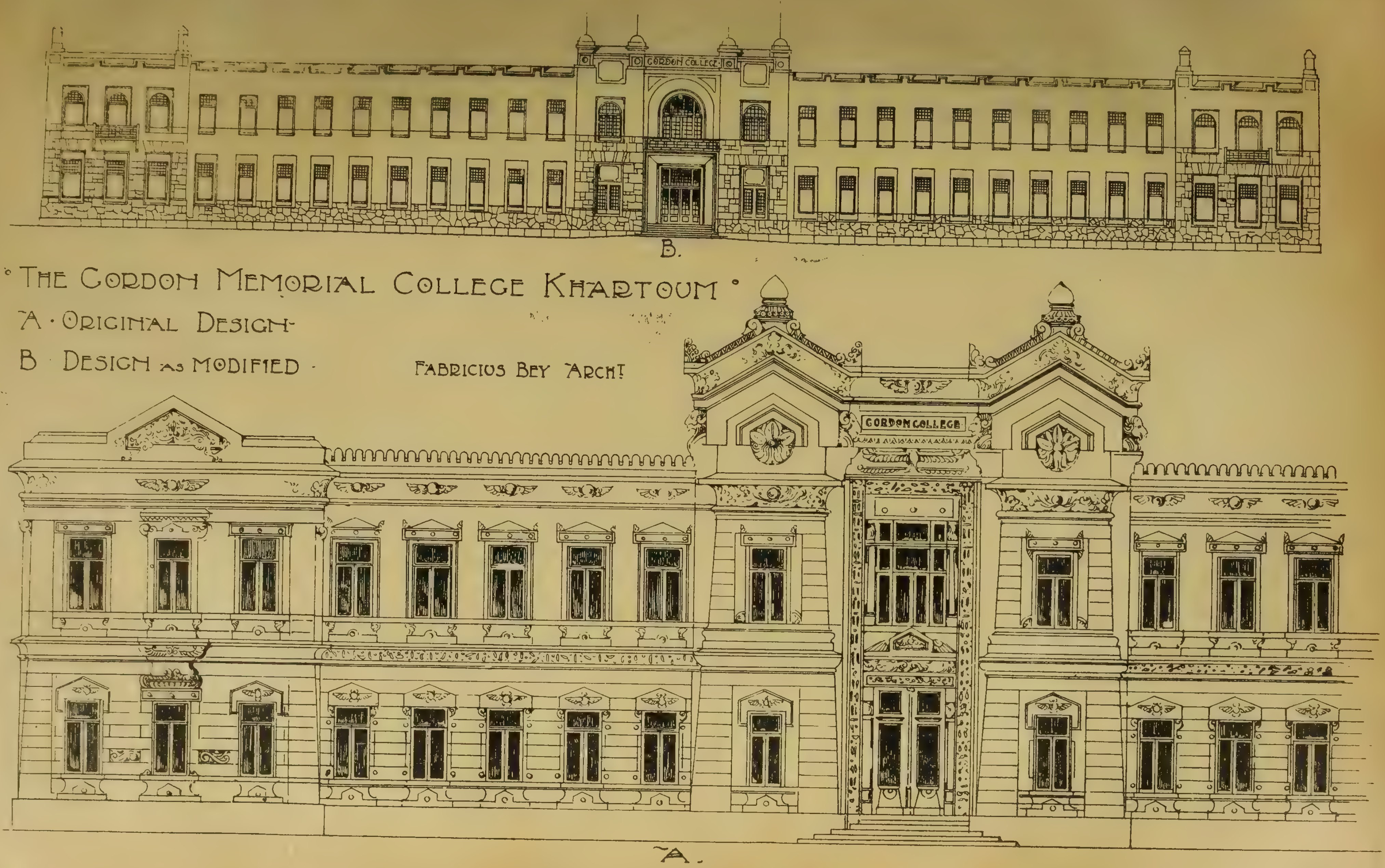

THE GORDON MEMORIAL COLLEGE KHARTOUM

A · ORIGINAL DESIGN

B DESIGN AS MODIFIED

FABRICIUS BEY ARCHT

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

NOTICE.

Bound copies of Vol. LXXV. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., and LXXV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

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RECEIVED.—N. D. A.—B. B. and Co.—S. W. L. Co.—G. K. M.—R. D. S. and Son.—W. L.

Correspondence.

VERY UN-LIMITED COMPETITION.

To the Editor of the BUILDING NEWS.

SIR,—Last week you gave through your columns an example of a "very limited competition." Permit me to send you an example this week of the opposite. I inclose "instructions" to architects for a competition for "alteration and extension" to the premises of the Mechanics' Institute, Pudsey.

I think it will only be needful for you to reproduce Instructions No. 1, 14, 16, and 18 to show the farcical nature of the competition.

MECHANICS' INSTITUTE, PUDSEY, July, 1899.
Alteration and Extension of Premises, &c.
Instructions to Architects.

No. 1.—Plans, drawings, and specifications complete in every way for the alteration and extension in accordance with the following recommendations, together with details and estimated cost thereof and fully detailed sections. Front elevation to be ⅛ scale. Recommendations:—

(*a*) Not less than two additional exits from the Victoria Hall.

(*b*) More commodious platform accommodation.

(*c*) No reduction of auditorium, but more accommodation if possible, even including such rearrangement of the Victoria Hall as may be found necessary.

(*d*) As much classroom accommodation as possible on the remainder of the site and in accordance with the regulations of the various educational authorities.

No. 14.—It is desirable that the total cost should not exceed £3,000. The Victoria Hall alterations and the proposed extensions to be estimated separately.

No. 16.—Architects are requested not to wait upon any officer or member of the committee.

No. 18.—The committee do not bind themselves to accept any set of plans; but if they accept that set to which the first prize is given, then the amount thereof is to be merged in the commission. The committee also reserve to themselves the right to carry out the extension apart from the alterations to the Victoria Hall if deemed desirable.

If any of the architects in the locality or elsewhere can afford in these busy times to expend their money, time, and brains—that is, men of any standing—I, as one who would like to compete under fair conditions, shall be much surprised.—I am, &c ,

Pudsey, July 19. FERMAIL.

EXTERNAL SOIL-PIPES ARCHITECTURALLY CONSIDERED.

SIR,—The drain specialist possibly would like to see the façades of our buildings enhanced by the display of soil-pipes and ventilators in all their obtrusive ugliness; or, yet worse, he would like to see these utilitarian necessities rendered more offensive still under the specious plea of their architectural adornment. The question of external soil-pipes has once more been brought prominently before the public by the instance afforded of evading the by-laws of the Metropolitan Building Act at the Carlton Hotel, of which conspicuous addition to the street architecture of London you gave some illustrations in the BUILDING NEWS for July 8, on the eve of the opening of the building in the Haymarket. To disfigure the elevation of such an ornate structure with a ramification of drain-pipes and bath wastes would, in my opinion, be monstrous; but I do not propose to enter here upon a disputation as to the merits of this particular case and the irrefragable character of the by-law as to external soil-pipes. I have had no inconsiderable experience in sanitary work in various parts of the country, and many years ago I designed and carried out one of the earliest schemes of complete iron drainage executed in London. Every manhole and trap was made of iron, and every pipe was inside the building, for, as a matter of fact, we had no choice. When the work is properly done there is much to be said in favour of keeping the soil-pipes inside buildings, solely from a practical point of view, and quite apart from the question of external appearance. I am quite sure about that. On a confined site, however, in a crowded city, and especially with so intricate a building as a big hotel, the difficulties of keeping all drains outside the premises is well-nigh an impossibility. Architects, when no such restrictions exist, it must be admitted, are much to blame for the want of care often shown in the planning of their buildings in this respect, and I allude more particularly to country residences and suburban houses in reference to the location of water-closets sinks and baths. As I write some notable instances of this kind of planning are before me, where the most inopportune and conspicuous positions have been chosen for the sanitary arrangements, rendering inevitable the prominent disfigurement caused by soil-pipes running through eaves and up the slopes of roofs to get the vents away from dormers and gable-windows. The open hopper head system introduced by Mr. Norman Shaw a decade or two ago, and now abandoned for many reasons, often made matters worse owing to the noise and noisomeness of such arrangement near front doorways and reception or bedroom windows. The only true architectural treatment of sanitary contrivances after all is said and done is to grapple with the conditions imposed by hygeian considerations, and to so plan a building as to keep w.c.s, baths, and sinks well together, and in such a way that the plumber's appliances are out of sight, and situate in a rear part of the premises. Some architects, for want of forethought, like other people, create their own difficulties very often. This is one of the worst.—I am, &c., OLD JUDGE.

Pembroke House Schools, Lytham, have been fitted with the latest improved hot-water heating apparatus by John King, Ltd., engineers, Liverpool, employing their well-known "steam-tube" apparatus, with special economical coil-heater with water-way fire-bars.

The foundation-stone was laid on Friday of a new wing about to be added to the Bethel, facing Plymouth Harbour. Messrs. H. J. Snell and M. A. Bazley, of Plymouth, are the joint architects. The new wing will consist of four stories of brick and Portland stone, and the total height will be about 56ft. There will be three classrooms and a reading-room, and the entrance will be from the quay. The cost will be £1,100, and the site has been given.

Intercommunication.

QUESTIONS.

[12268.]—**Varnishing Wood-Block Flooring.**—Will any of your correspondents be so good as to advise a clergyman as to whether he should, or should not, varnish the new pitch-pine wood-block flooring of his church, which is laid upon a foundation of concrete? The flooring appears to have been successfully laid, and from several months' experience seems to be dry and to wear well; but some friends think that if varnished it could then be rubbed with damp cloths, and would assume a glossy and attractive appearance. Others, however, consider it would be better if left untreated.—H. B. N.

[12269.]—**Destructor.**—Can any reader recommend a destructor suitable for the treatment of infectious matter from an hospital of 12 beds, or refer me to the maker or patentee of "Crane's" destructor, recommended by the late Sir Douglas Galton in his book on "Hospital Construction?"

[12270.]—**Bay Windows, &c.**—Is it necessary to obtain sanction from vestry for building a bay window? The window will merely occupy 3ft. projection of space in the forecourt. Is any official notice required for extending back premises?—A. L.

[12271.]—**Sun-blinds.**—I have a window in my house exposed to the south and west sun, and the room is uninhabitable during this hot weather. Is there any good blind or window awning that I can fix outside? Any information will oblige.—CONSTANT READER.

[12272.]—**Price of Yellow Deal.**—Perhaps a practical buyer of timber can say what is a fair price (prime cost) for yellow deal? Petersburg first yellow deals are quoted at from £12 to £14 per standard. For flooring, the prices given for prepared boards, 1in. thick by 6½in., are 11s. 6d. and 14s. 9d. for first yellow, and 10s. to 12s. for "seconds." Are these reliable prices to estimate from?—A COUNTRY PRACTITIONER.

[12273.]—**Public Health Act.**—1. What is to be deemed a new street under the Public Health Act, 1875, Par. 157-1? 2. Has a district council, working under the Model By-Laws, 1886, any power to make you set back and level an old public highway, 18ft. from centre of same, at your own expense, before you can build on the land abutting on the said road, provided that you keep the houses back the 18ft. from the centre of the road? 3. Is there anything in the Model By-Laws, 1886, or in the Public Health Act to say that the footways at side of a road shall not be either above or below the level of said road?—QUO WARRANTO.

REPLIES.

[12263.]—**Water in Cellar.**—Probably the water comes from higher ground in the neighbourhood, or the site is water-logged. I should advise "Olev" to sink a deep trench round or on the higher side of land, and put in another tile drain, so as to intercept the soakage; or the cellar floors may be taken up, the soil dug out and puddled with clay before relaying the floor. Sometimes a deep trench filled in with rough stones dug round the house has effected a cure.—PRACTICAL.

[12265.]—**Water in Cellar.**—I should recommend "Olev" to line his cellars with Callender's "pure bitumen sheeting," advertised in the BUILDING NEWS. It has been used for damp cellars, underground conveniences, reservoirs, &c., and resists the percolation of moisture. The floor and walls should be both lined. Write for particulars to Callender and Co., 11, Victoria-street.—G. H. G.

[12267.]—**Stone Heads.**—It is not desirable or proper to have long bearings for stone heads to windows or porches. In Classic porticoes the stone is often cut to form concealed arch joints; the joints are externally cut vertically for 2in. or 3in., and the inner part is made to form a voussoir joint or joggled; in many cases it is done by encasing an iron I girder, the stone being divided vertically in the centre and grooves sunk for the flanges; the front and back thicknesses of stone are connected by copper cramps bedded in cement and stone-dust. The joint is rubbed smooth and made invisible. Many entablatures or architraves are formed in this manner; the stone forming really a casing for the girder. Wide window lintels are done in this manner, but the practice is not good construction, and the iron is apt to corrode and fracture the stone. The joggled or concealed arch method is better for heads of limited length of bearing, but sometimes these fail at the joints. Stone heads for windows should be solid stone, and be proportioned to the span of opening, mullions being used. Of course, a relieving arch relieves the dead-weight over, and can be used when the long stone window heads are used.—G. H. G.

Mr. Henry Maudslay, M.Inst.C.E., eldest son of the late Thomas Henry Maudslay, and of the firm of Maudslay, Son, and Field, died on Tuesday last at Westminster.

A meeting of the subscribers to the Hawick "1514" picture, painted by Mr. Tom Scott, A.R.S.A., in commemoration of the capture of a flag by Hawick callants from an English marauding band at Hornshole, the year after Flodden, was held in the municipal buildings, Hawick, N.B., on Friday, when the picture and a signed artist's proof etching were formally presented to the town council to be hung in the town hall.

Mr. G. W. Wilcocks, Local Government Board inspector, held an inquiry at the Workmen's Institute, Hildenborough, Kent, on Friday and Saturday, into the subject matter of an application by the Tonbridge Rural District Council to borrow a loan of £7,000 for the purposes of sewerage and sewage disposal for the parish. Mr. W. Vaux Graham, C.E., the engineer, explained the plans.

PROFESSIONAL AND TRADE SOCIETIES.

BIRMINGHAM ARCHÆOLOGICAL SOCIETY.—This society made an excursion on Saturday to the neighbourhood of Hales Owen. The interior of the church presents a very remarkable appearance, the middle of the church being of 15th-century date, while the two bays at the west end and the east end are of 12th-century work. A bold experiment was made here a few years ago in raising the inconveniently-low Norman chancel arch. The party then visited the Abbey, by permission of Mr. Hill, noting on the way the evidences of the ancient fish-ponds. This Abbey, founded by the Premonstratensian, or White Canons, now presents to the view but small remains of its ancient beauty. The existing portions show that it was once a fine series of buildings of Early English date. Ascending by a rural lane, the visitors reached the Leaseowes, the well-known home of William Shenstone, the poet. The party traced out the streams, the walks, the lakes and pools, and the woods, which still bear evidence to the taste of the poetic creator of this landscape garden. Mr. F. B. Andrews, F.R.I.B.A., explained the architectural features of the excursion.

KENT ARCHÆOLOGICAL SOCIETY.—The annual meeting of this society will be held at Bromley on Tuesday and Wednesday next. The business meeting will be held at 11.45 a.m. on the former day, under the presidency of Earl Stanhope. The Parish Church and Bromley College will afterwards be visited. Next progress will be made to Eltham Palace, the history of which will be related by Mr. A. G. Milne. After walking through the garden of The Moat, the members will visit Eltham Lodge, which contains some Flemish tapestry of the 17th century. The annual dinner, like the annual business meeting, will be held on the Royal Bell Hotel, Bromley. At the evening meeting Mr. P. Norman, F.S.A., will dwell on "Recollections of Old Bromley," illustrated by means of lantern pictures, while Mr. G. Payne, F.L.S., F.S.A., will read a paper on the archæology of the district. For Wednesday visits have been arranged to West Wickham Court, the residence of Sir J. Farnaby Lennard, and the church adjoining; Holwood Camp, where Sir John Lubbock, M.P., F.R.S., will give an address, afterwards conducting the members round the famous pre-Roman earthworks; and Warr Bank, where Roman foundations may be seen. The day's proceedings will terminate at High Elms, where the members will be entertained at afternoon tea by Lady Lubbock.

THE NATIONAL ASSOCIATION OF MASTER BUILDERS.—The conference of the National Association of Master Builders of Great Britain and Ireland opened at Plymouth on Wednesday. In the morning the Mayor of Plymouth (Mr. J. Pethick), himself a well-known contractor and builder, welcomed the visitors to the town. A meeting of the council followed. The half-yearly meeting of the association was held in the afternoon, Alderman W. Holdsworth, of Bradford, presiding. The chairman, in an introductory address, referred to the dispute between the master builders and the plasterers. He regretted that some of the terms of settlement had not been observed by the plasterers, and announced that on the 26th inst. it was proposed to hold another conference with the plasterers with a view of adjusting differences and disputes arising over the interpretation of some of the terms of the previous conference. The principal topic of discussion was the builders' relation with the plasterers, and representatives from Manchester and Bristol complained strongly of the attitude of the latter towards the builders and their neglect to abide by the conditions of the conference terms. The Manchester representatives declared that the plasterers had demanded a rise of a penny in their wages as compensation for the lock-out, and the result was that members of the association refusing this demand had been boycotted for a long time past. It was said that unless the plasterers in these and other districts showed a different spirit from that which was at present being shown, a general lock-out would soon be brought about. It was agreed to make a special point of the difficulties at Manchester and Bristol at the forthcoming conference.

SCOTTISH BUILDING TRADES' FEDERATION.—The quarterly meeting of the executive of this federation was held on Tuesday in the Caledonian Hotel, Inverness. Representatives were present from Glasgow, Edinburgh, Dundee, Aberdeen, and other southern centres. The chair was occupied by the president, Mr. James Leslie, builder, Aberdeen. The report of the secretary, Mr. James L. Selkirk, C.A., Glasgow, on the operations of the federation during the quarter was submitted and considered at considerable length. The discussion was of a thoroughly practical kind, and resolutions were arrived at intended to lead to a more complete consolidation of the Federation in all parts of the country. In the afternoon the members visited the battlefield of Culloden. In the evening a meeting took place, under the presidency of Treasurer Ross, president of the Inverness branch, when addresses were delivered by the delegates upon the importance of organisation as desiderated by the Federation. Among the speakers were Mr. Leslie, Aberdeen; Mr. Robert Lamb, Edinburgh; Mr. Adams, Glasgow; Mr. Shaw, Dundee; Mr. Selkirk, Glasgow, secretary of the Federation.

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CHIPS.

On Saturday afternoon the foundation-stones of a new church in Waterfall-lane, St. Paul's parish, Blackheath, Birmingham, were laid. The building will accommodate 350 persons.

The Prince and Princess of Wales laid yesterday (Thursday) the foundation-stone of a new building in connection with the Foundling Hospital, Bloomsbury.

The Devonport Town Council are pledged to a house-building scheme of extensive character. They have decided that the surplus land on the cemetery site shall be transferred to the Housing of the Working Classes Committee at the price of 4d. per foot. The available area is 19 acres, or sufficient for the erection of 450 houses. The policy of the committee is to build these houses or to have them built by contract for the corporation, who will ultimately be property-owners on a very large scale.

An interesting ceremony took place on the summit of the west front of Peterborough Cathedral on Friday, when, in the presence of the Dean and representatives of the Restoration Committee, the huge cross on the southern gable was replaced in position. The work of the restoration of the central tower and the north and south gables of the matchless west front has been in progress 15 years, and nearly £80,000 has been expended, first under the late Mr. J. L. Pearson, R.A., and since his decease under Mr. G. F. Bodley, A.R.A. Mr. J. T. Irvine has acted as clerk of works throughout. Messrs. Thompson and Sons have been the contractors. There still remains to be reconstructed the central gable, for which another £5,000 is wanted.

Twenty-four master and operative plumbers, who came from different parts of London and from Grantham, Guildford, Harpenden, Leatherhead, Littlestone-on-Sea, Redhill, Sidcup, and Windsor, applying for registration under the National Registration of Plumbers, attended at the King's College on Saturday for examination by the Worshipful Company of Plumbers. Seven candidates succeeded in passing the practical tests, which included lead-bossing, pipe-bending, and joint-making.

Memorial-stones of the Bethel Mission-hall were laid in Henrietta-street, Old Trafford, on Saturday. The building will be Gothic in style, and will measure 76ft. by 30ft., accommodating 350 persons at a cost of £800. Mr. Crowcroft is the architect, and Mr. Barker the contractor.

A Jubilee memorial lych-gate was opened last week with a special service at Tackley, near Oxford. The gate is a handsome structure designed by Mr. T. Garner. The side walls of the gate are of hard white Box Ground Bath stone, surmounted by carved open tracery in oak. The posts, gates, bargeboards, and the rest of the woodwork are all in solid English oak, and the high-pitched roof is of grey Stonesfield slates.

Major Marindin and Major Carden, on behal of the Board of Trade, made an official inspection on Friday of the tramway extensions which have been carried out by the Coventry and District Tramways Company, whereby several outlying parts of the city will be placed in connection with the centre of the borough. The work has been carried out by Messrs. Pauling and Co., to designs and specifications prepared by Mr. I. E. Winslow, chief engineer to the New General Traction Company, Mr. H. C. Elliott being the contractors' engineer in charge of the work.

Two stained-glass windows have recently been placed in the north aisle of Camerton Church. Each window consists of three lights, the subjects being respectively "The Annunciation," and "Elisha and the Shunammite Woman." Messrs. Joseph Bell and Son, of College Green, Bristol, are the artists.

STAINED GLASS.

DEVONPORT TECHNICAL SCHOOLS.—The stained-glass window which the mayor has presented to the Technical Schools will be unveiled by Sir W. White, the Director of Naval Construction, on Tuesday next. The window is fixed opposite the main entrance, and the figures are nearly life-size. They represent: Art, an emblematical figure holding in one hand a crayon, and in the other a study from the life. The figure stands in an architectural setting of Renaissance design. The next figure—Science—is similarly treated as to setting in architectural framework. She holds in her hand a cog-wheel; behind her are emblems of Electricity and Chemistry. The window is composed of two round-headed compartments, divided by a transom, with large circular tracery and spandrel pieces at the top. Below these figures of Art and Science are others representing Mechanical Engineering and Naval Architecture. The large central tracery has a representation of the arms of the borough set in a wreath of oak leaves.

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WATER SUPPLY AND SANITARY MATTERS.

DERWENT WATER SCHEME.—The Committee of the House of Lords presided over by the Earl of Lauderdale passed, on Tuesday, the Bill which has already received the sanction of the House of Commons, constituting a joint board, consisting of representatives of the corporations of Sheffield, Derby, Nottingham, and Leicester, and the Derbyshire County Council, for the purpose of acquiring and administering the waters of the river Derwent and its tributaries for the supply of the inhabitants of their respective towns and districts. In giving his decision, the Earl of Lauderdale said the Bill would be allowed to proceed subject to the allocation of a million gallons a day to the county of Nottingham out of the 28,000,000 gallons a day previously appropriated by the towns of Sheffield, Derby, Leicester, and Nottingham, which would mean that they would each have to forfeit one-twenty-eighth of their share, whilst the share of Derby county would remain as fixed, at 5,000,000 gallons a day. This arrangement would terminate in the year 1930, when it was anticipated that the supply of the Derwent would be practically all in use. Chesterfield Rural District Council would be entitled to 12½ gallons per day per head of their population, and an arbitration clause would be inserted for the protection of Mr. C. S. Leslie, a mill-owner.

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The second summer excursion of the East Riding Antiquarian Society was held on Friday, when the barrows at North Burton, Wold Newton, and the fine parish church of Thwing were visited.

The new water supply with which the Errol district has been provided, through the munificence of Sir William Ogilvy Dalgleish, Bart., and Lady Dalgleish, was formally inaugurated last week. The water is drawn from the top of Fingask glen from a height 540ft. above the sea level, and the reservoir is capable of holding 120,000 gallons. Mr. Ritchie, C.E., of Perth, is the engineer.

Works of restoration, including a new oak and lead roof, have just been completed in the south aisle of St. James's Church, Deeping, from plans by Mr. J. S. Traylen, of Stamford. Mr. S. F. Halliday, also of Stamford, was the builder.

The corner-stone of the Nicholson Institute at Leek, comprising a school of art, science, and technology, and a county silk school, will be laid by the Duchess of Sutherland on Monday next, the 24th inst.

The Board of Trade have confirmed an order authorising the construction of a light railway in Essex between Corringham, Thames Haven, and Kynochtown.

Mr. Chas. Perrin, M.Inst.C.E., an inspector of the Local Government Board, held an inquiry at the Union Offices, South-parade, Leeds, on Friday, relative to an application by the Roundhay and Seacroft Rural District Council to borrow £13,900 upon a sewerage scheme for Roundhay.

The partnership heretofore existing between J. H. Stones and A. R. Gradwell, architects and surveyors, Blackburn and Darwen, under the style of Stones and Gradwell, has been dissolved; as has also that between J. H. Stones, A. R. Gradwell, and W. G. Stones, civil and mechanical engineers, Blackburn, under the style of Stones, Gradwell, and Stones, so far as regards A. R. Gradwell.

The Light Railway Commissioners have decided to grant the application of the Drake and Gorham Electric Traction Co. for the East Anglian Light Railway, so far as it relates to railways Nos. 6, 7, and 8, being those from the south side of the entrance to Lowestoft Harbour to Kessingland. The promoters will seek Parliamentary powers next session for extending the line to the northern part of the borough of Lowestoft.

LEGAL INTELLIGENCE.

Architects and Unexecuted Plans.—At the Birmingham County Court on the 13th inst., before Judge Whitehouse and a jury, Messrs. Riley and Smith, architects, Colmore-row, sought to recover from Mrs. Clara Mason, hotel-keeper, Stourbridge, the sum of £96 17s., professional charges for services rendered. The case for the plaintiffs was that they were instructed by the defendant to prepare plans for four pairs of semi-detached houses at Amblecote. The land had cost the defendant about £1,000, and she wished the plaintiffs to prepare plans for the houses to cost about £900 a pair. She desired to let the houses at £25 to £30 each, and expected to get a return of 5 per cent. for her outlay. Plaintiffs prepared three sets of plans, but the defendant decided, after seeing the estimates, not to accept any of them, because the prices came out at considerably more than she was willing to pay. The plaintiffs had received no remuneration for their services, and contended that they were entitled to be paid for the work they had done. Mr. George Harry Smith said that he told the defendant that she could not build that class of house to pay 5 per cent. Mr. Dorsett, for defendants: Do you mean to say that you cannot build £30 houses to pay 5 per cent. ? Mr. Smith: You cannot build them to pay 5 per cent. net; you may to pay 5 per cent. gross. Mrs. Mason was called, and stated that the estimates were about £400 or £500 above the amount which she told Mr. Smith that she was prepared to expend. The plans were, therefore, useless to her, and she had derived no benefit whatever from them. The jury gave a verdict for the plaintiffs for £35.

Another Defect in the Workmen's Compensation Act.—Judge Willis, Q.C., has decided that a painter named Rivatt, who was injured through a scaffold collapse while painting a ventilator 30ft. 6in. from the ground on Higham Chapel, Norfolk, is not entitled to compensation. Under the Act a building must exceed 30ft. in height, but the roof of the chapel was only 27ft., and the gable end 28ft. high. His Honour considered the ventilator not to be included in the measurement of the building. The Act did not, he said, define what a building was, and he should not attempt to do so.

Actions for Architects' Fees.—At the Wolverhampton County-court on Tuesday, an action was heard in which Messrs. Manton and Sons, architects, Wolverhampton, sought to recover £21 17s. from Trouncer and Co., brewers, of Shrewsbury, and Mr. Burdass, a member of the firm, for fees for the preparation of plans and other work. The plaintiffs' case was that they received instructions from Mr. Burdass to prepare the plans and specifications for alterations in connection with the Onward Club at Compton, at five per cent. After the work had been completed the alterations were not proceeded with, and a dispute arose as to the amount to be paid. Defendants had paid £10 18s. 6d. into court as a fair sum. The defence was that the plaintiffs had exceeded instructions. His Honour considered the amount paid into court sufficient, and gave judgment for the defendants.—In a second case heard at the same court, Richard James Rowe, architect, of Bilston, sought to recover from Edwin Jones, of Mount Pleasant, Bilston, £62 14s. for architect's fees. Plaintiff said in January he received instructions from defendant to survey a piece of land in Wellington-road, Bilston, prepare plans for the erection of four houses, get out the quantities, and obtain tenders. The lowest tender was £2,090. Subsequently defendant decided not to build. For the defence, it was contended that the cost of the houses was not to exceed £1,600, and that defendant was only to charge four per cent. Judgment was given for the amount claimed, with costs.

Arbitration Award at East Finchley.—Mr. C. C. Paine, a builder, has just been awarded £8,844 compensation in a claim against the New River Company for land taken, depreciation, and loss of builder's profits in respect of about five acres of freehold land forming a portion of an estate of 17½ acres situated on the Fortis Green-road, between East Finchley and Muswell Hill. The land was required by the company for the purpose of a reservoir in connection with the new supply to be derived from the Staines reservoirs.

What is a Common Lodging-House?—Lord Radstock, the Hon. S. S. Waldegrave, Mr. T. A. Denny, and others appeared before Mr. Cluer at the Worship-street Police-court, on Monday, to answer summonses, issued at the instance of the London County Council, charging them with having, contrary to the Common Lodging-house Act, 1851, kept the Victoria Home, Whitechapel-road, as a common lodging-house, without the same having been inspected and approved by the local authority, and registered as required by the Act. The contention of the County Council, who relied on "Langdon v. Broadbent," was that the Home answered to the description of a common lodging-house, and should, therefore, be registered. The defence, on the other hand, was that the institution was not carried on for the purpose of making a profit, but for purely charitable objects, and the case of "Booth v. Ferrett" was cited. The magistrate, deciding in favour of the latter contention, dismissed the summonses, ordered the County Council to pay ten guineas costs, and intimated his willingness to state a case for the opinion of the High Court.

Arbitration Case in Leeds.—The Leeds Corporation are seeking to acquire the water-rights belonging to Dob Park Mill, and five acres of land, at Weston, near Otley, owned by the trustees of William Thornton, their object being to obtain greater control over the purity of the water. The trustees claimed over £8,000 for the property, and an arbitration court was held at the Leeds Town Hall on Friday and Saturday to decide as to the sum to be paid by the corporation. Mr. C. M. Atkinson, the Leeds Stipendiary Magistrate, was the umpire, Mr. J. W. Dacre was the arbitrator for the corporation, and Mr. J. Waugh, Bradford, for the claimants. Mr. Windsor Thorp, architect, of Leeds, for the claimants, valued the estate at £6,100, and Mr. W. B. Woodhead, of Bradford, placed the figure at £5,445. Mr. E. J. Silcock, C.E., Leeds, gave evidence for the corporation as to the position and construction of the mill, and as to the amount of power available for grinding corn. Mr. W. Middleton, Keighley, valued the property at £970; Mr. E. L. Clare, of Bradford, mentioned the sum of £962 10s.; and Mr. Charles Gott, C.E., of Bradford, assessed the value at £950. Mr. E. M. Eaton, C.E., of London and Sheffield, also gave evidence. The umpire reserved his award.

Arbitration Award at Upnor, Kent.—Lord Ludlow has given his award in the arbitration case "Little v. the Lords of the Admiralty," which had reference to some waterside property at Upnor, near Chatham, which their lordships had acquired under the compulsory powers vested in them by the National Defence Act. The owners claimed £46,900 as compensation, but during the hearing of the case withdrew one section relating to their barge trade, which reduced the claim to about £28,500. The arbitrator has awarded the plaintiffs £15,000.

CHIPS.

The new drill-hall, Weymouth, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At Petersham, Surrey, a church-room and institute are being erected, at the cost of Mrs. Warde, on a part of the Bute House estate. The buildings are to be Classic in style and carried out in red brick. Mr. John Kelly is the architect, and Mr. G. W. Heasler is the builder.

The members of the Society of Estate Clerks of Works, to the number of fifty, assembled from all parts of Great Britain and Ireland, held their summer meeting in the Central Hotel, Edinburgh, on Thursday, Friday, and Saturday in last week.

Memorial-stones of the Westgate Baptist Chapel and schools were laid in Carlisle-road, Manningham, Bradford, on Saturday. The architect is Mr. James Ledingham, of Bradford, and the cost, exclusive of site, will be £11,670.

The Princess Henry of Battenberg, as Governor of the Isle of Wight, has given her cordial consent to a scheme for the rebuilding of the Chapel of of St. Nicholas, within Carisbrook Castle, as a memorial to Charles I.

The South-Eastern and Chatham and Dover Railways (New Lines) Bill came before a committee of the House of Lords on Tuesday. Its object is to empower the South-Eastern Railway Company to make new lines forming junctions with the London, Chatham, and Dover Railway at Chislehurst, Otford, Broadstairs, Margate, and Whitstable. The Bill was ordered to be reported with amendments.

The pier pavilion at Hastings has just been redecorated and refurnished from plans by Mr. Henry Ward, F.R.I.B.A. The decorations are the work of Mr. Lester.

The partnership hitherto subsisting between E. W. Fry and F. M. Gardener, architects and surveyors, of Dover, under the style of Fry and Gardener, has been dissolved.

A small picture of the Virgin leading the infant Christ by the hand, by Francesco di Giorgio, a Sienese painter of the 15th century, purchased from the Bardini collection, has been added to the National Gallery. It is placed in Room No. 2.

The Hornsey Urban District Council have accepted a tender of Messrs. Willmott for £13,639 for the erection of 60 artisans' houses with rents from 6s. to 9s. per week. The cost of the site and roads is £3,070, and the income is estimated at £1,123 ant the out-goings at £1,035. The council have just completed 120 dwellings for £25,601 15s. 3d. All are fully occupied, and are greatly sought after. But for the rise in the price of material the rents would have been 6d. a week less.

Our Office Table.

The members of the Society of Architects will visit Canterbury and St. Margaret's Bay, Dover, on Saturday in next week, the 29th inst. Leaving Victoria by the 10 a.m. train, the party will, on arrival at Canterbury, proceed at once to the Cathedral, where the Very Rev. Dean Farrar, D.D., F.R.S., Hon. Mem., will meet the party and act as guide. A train leaves Canterbury for Martin Mill at 3 p.m., where conveyances will be in readiness to take the party to St. Margaret's Bay; here the church will be visited, under the guidance of the President, Mr. T. W. L. Emden, J.P., L.C.C., who will afterwards (6 p.m.) entertain the members to dinner at the Granville Arms Hotel. Train leaves Martin Mill at 8.12 p.m., arriving at Victoria at 10.55 p.m. Members' names must be sent to the secretary not later than Monday, July 24th, accompanied (in the case of those desirous of taking advantage of the special reduced fare from Victoria) by P.O. for 6s. 8d.

Queen Anne's Drawing-room in Hampton Court Palace was opened to the public on Saturday morning, after the removal from the walls of the canvas and flock papers, which since the days of Queen Caroline had concealed from view the decorative paintings by Verrio. The existence of these pictures, three in number, was ascertained as far back as 1881, by Mr. Ernest Law, the historian of the palace. Now that many of the pictures have been removed from the overcrowded walls of the building to Kensington Palace, Viscount Esher has had the whole of the remaining works rearranged, and the walls of this drawing-room stripped so as to reveal Verrio's allegorical paintings. In the central picture, Queen Anne is seated on her throne dispensing justice; on her right Hercules is crushing Vice and Crime; before her female figures, representing the four quarters of the globe, are kneeling and offering sacrifice. On the north wall the Queen's Consort, Prince George of Denmark, is standing in full armour under a canopy, the sea as a background; at his feet nymphs are sporting in the water, and the British Fleet fills the offing. On the south wall Cupid, seated in a shell, is being drawn by sea-horses, nymphs, dolphins, &c., while behind him is marshalled the fleet.

Two years ago Mr. F. C. Penrose, F.R.S., published some observations on Greek temples, his theory being that in every case these had been so constructed that certain stars illumined the sanctuary at fixed dates. Some of his conclusions were called in question, and his measurements criticised. In the summer of last year Mr. Penrose again visited Greece and Sicily, and measured some of the temples with greater exactitude. In a few instances he has found it necessary to make amendments; but in most cases his earlier conclusions have been confirmed. The most interesting point brought out by the re-examination is the fact that with regard to two Athenian temples—namely, the Theseum and the later Erectheum, it is shown that the days of those months on which the sunrise, heralded by the star, illuminated the sanctuary coincided exactly, on certain years of the Metonic cycle, with the days of the Athenian lunar months on which three important festivals known to be connected with at least one of these temples were held. The years so determined agree remarkably well with the probable dates of the dedication of those temples, and in the case of the first mentioned, the festival, which was named the Thesea, seems to leave little doubt that the traditional name of the temple, which has recently been much disputed, is the correct one.

The Asylums Committee of the London County Council, in asking on Tuesday for a further sum of £70,000 in connection with the building of the asylum at Bexley Heath, gave some suggestive figures as to the cost per bed at various asylums in the country. A sum of £350,000 has already been sanctioned for the building at Bexley Heath, and the Committee stated that even with the additional £70,000 which they were now asking for, the cost per bed will only amount to about £210, the asylum being intended to accommodate 2,000 patients. It is pointed out that at asylums recently erected in West Somerset and in North Staffordshire the cost per bed was £377 and £280 respectively, while in the case of asylums which are being constructed in Lincolnshire and in

St. Alban's the cost will be £300 and £250 respectively. The proposed additional grant was voted by the Council, a proposal that a special committee should be formed to inquire into the circumstances which had rendered an extra estimate necessary being defeated.

THE question as to whether a gasometer is a building was raised at Saturday's meeting of the Stranraer Dean of Guild Court. The clerk submitted plans of a new gasometer proposed to be erected by Stranraer Gas Company on a vacant piece of ground in Market-street adjoining the present gasometer. The Dean of Guild said he had looked up the Police Act, and he could not see a single clause in the Act, or the summary, of authority vested in the Court under which they could grant authority for the erection of a gasometer. He did not think a gasometer was a building within the meaning of the Act. The clerk, on the other hand, considered a gasometer was a building. The Dean said that so far as he read the Act there was nothing to give the Court authority. It was agreed to approve of the plan and sanction the erection of the gasometer so far as the Court might legally have the right to do so.

AT the last meeting of the Limerick County Council, a report was read from the county surveyor, Mr. J. Horan, relative to a scheme for improved arterial drainage and reclamation of waste lands in Limerick. The matter was brought before the council some time ago, and was referred to Mr. Horan for his report, which was, on the whole, favourable to the project. The expenditure on river regulation and kindred works Mr. Horan estimated at £120,000, and on reclamation £100,000. This outlay might be expected to be reproductive. The basis of the scheme would be compulsory purchase of lands affected, and it would be necessary that statutory powers should be given to the county council in such matters. It was assumed that every county in Ireland would co-operate in the scheme. After some discussion a resolution was unanimously adopted stating that the county council were of opinion that the matter should be dealt with by the Legislature, that power should be conferred on county councils generally to initiate such works, and that copies of the resolution be sent to the chief secretary and others interested.

PARTICULARS have just been published of a gigantic engineering scheme at Hodbarrow Iron Mines in the South of Cumberland, in the form of a great sea embankment, intended to keep the sea out of the workings of a valuable mine. Some ten years ago nearly £200,000 was spent in the building of a sea-wall at the same place. It is now proposed to go farther seawards with a more ambitious scheme. The new wall will be in the form of an embankment with a puddled trench, and with rough squares of concrete tumbled higgledy-piggledy as a means of breaking the force of the wash from the sea. This new embankment will be 6,750 yards long, and will inclose 170 acres of land, under which the new extension of the mine will be worked. Ore has been proved to exist in vast deposits under this area, and, although the cost of the proposed scheme will probably be from £400,000 to £500,000, it is well worth the enterprise, as Hodbarrow ore is not only the best hematite in England, but is of the most uniform in quality.

* * *

An inquiry will be held at the public offices, Egremont, on Thursday next, the 27th inst., at ten o'clock in the forenoon, by Mr. G. W. Willcocks, M.I.C.E., into the application of the council to borrow £7,380 for the construction of a new road from Wallasey village to the shore, £4,318 for the improvement of Poulton-road, Seacombe, and £300 for the provision of an underground convenience at Liscard-road.

The corporation of Maidstone have adopted a scheme prepared by Messrs. Stevens and Barker for carrying-out the electric lighting of the borough. The estimated cost of the electrical plant selected is £22,500.

At Wath-on-Dearne, on Friday, foundation-stones of a new Primitive Methodist chapel (to cost £1,240) were laid. The chapel is to accommodate 300 worshippers. A meeting was afterwards held, presided over by the architect, Mr. W. G. Smithson, of Leeds.

Mr. W. H. Byrne, of Dublin, has been appointed to succeed the late Mr. William Hague as architect to several works left unfinished at the time of the latter gentleman's death. They include the new church and the cathedral, Kilkenny, and an important ecclesiastical work in Co. Meath.

MEETINGS FOR THE ENSUING WEEK.

WEDNESDAY.—Society of Architects. St. James's Hall, Piccadilly, W. 8 p.m.

SATURDAY.—Society of Architects. Visit to Canterbury and St. Margaret's Bay, Dover. Leave Victoria 10 a.m.

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THE ARCHITECTURAL ASSOCIATION.

JULY 29th.—VISIT to GUILDFORD ALMSHOUSES, ST. MARY'S CHURCH, GUILDHALL, ABBOTT'S HOSPITAL, &c. Meet at Waterloo Main Line Booking Office at 1.30 p.m. for the 1.50 train. P.O. 4s to be sent to Mr. F. D. CLAPHAM, Fryern House, Eltham, by July 26th.

G. B. CARVILL }
R. S. BALFOUR } Hon. Secs.

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Trade News.

WAGES MOVEMENTS.

THE SKILLED LABOUR MARKET is shown by the monthly Board of Trade returns to have been in a good condition during June. The percentage of unemployed during the month was lower than in any year since 1890. The number of fresh disputes which arose was 59, involving some 14,000 persons; 22 of these were in the building trade. Employment in the building trades has continued good. The percentage of unemployed union members among carpenters and plumbers at the end of June was 1·5, compared with 1·3 in April and May. The percentage for June, 1898, was 1·2. In the furnishing trades employment has continued brisk. The percentage of unemployed union members at the end of June was the same as in May—viz., 0·9. The percentage for June, 1898, was 1·3.

GRIMSBY.—There is now every prospect of the dispute between Grimsby bricklayers and the master builders coming to a settlement, the employers having resolved to advance the men's wages to 8½d. per hour. The amount asked for was 9d. per hour.

NEWCASTLE-ON-TYNE.—At a meeting of the Master Builders in Newcastle on Friday night it was decided to give the advance of ½d. demanded by the local joiners. The strike was thereby ended, and the men returned to work on Monday.

THE YORKSHIRE LOCK-OUT.—The Yorkshire employers have arrived at a provisional settlement with the bricklayers, practically upon the terms submitted by the Editor of the *Daily News*. As the result of friendly negotiations a national conference between the employers and the trades has been fixed for Thursday next, the 27th inst., and there is now a fair chance that the dispute, which has been dragging for so many weeks in Yorkshire, will be ended within a very short time. This will avert the further threatened strike of carpenters in that county.

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CHIPS.

Two new homes were opened on Monday by the Duchess of Sutherland in the Training Farm Colony established at Lingfield, Surrey. One of these homes contains a dormitory, dining-room, and reading-room, &c., for fifty-six men, and accommodation for ten house-brothers, and the other is a home for thirty epileptic children sent by boards of guardians, which is attached to the director's house.

The Lancashire and Yorkshire Railway Company have just commenced to carry out a scheme of improvements at Low Moor, which practically involves the erection of a new station. It is proposed to convert the present down platform into an island platform and to rebuild the whole of the existing station structures, the estimated outlay being over £12,000.

The amount of business done at the Auction Mart, Tokenhouse-yard, last week was £227,482, which was in excess of the corresponding week last year.

The new Nurses' Home, in connection with Queen Charlotte's Lying-in Hospital, Marylebone, was opened on Monday by the Duchess of York. The building, which has cost for erection and furnishing £12,000, provides accommodation for sixty nurses and ten members of the staff, and there is also a sick ward capable of holding two patients. A portion of the premises has been adapted for occupation by the medical students. Mr. F. W. Hunt is the honorary architect.

The vicar of Cirencester has dedicated a stained-glass window erected in the Trinity Chapel of the parish church as a memorial to the labours of the late vicar (Archdeacon Hayward) for 17 years. The window continues the series already begun in the chapel, and contains the figures of SS. Timothy, Titus, Ignatius, and Polycarp. It is by Messrs. Hardman and Co., of Birmingham.

An adjudication in bankruptcy has been made in the case of Henry John Lansbury, of King William-street, E.C., and North-street, late Park-road, Bromley, S.E., surveyor.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	7 5 0	,,	8 5 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£10 15 0	...	£11 0 0
Best ditto	11 5 0	...	11 10 0

	Per ton.		Per ton.
Cast-Iron Columns	£6 10 0	to	£9 0 0
Cast-Iron Stanchions	6 10 0	,,	9 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	11 10 0	,,	12 10 0
Cast-Iron Sash Weights	4 12 6	,,	4 15 6
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 7 6	to	£6 12 6
4in. to 6in.	6 2 6	,,	6 7 6
7in. to 24in. (all sizes)	5 12 6	,,	5 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 2 6	,,	17 2 6
Pig Lead, in 1cwt. pigs	15 7 6	,,	16 7 6
Lead Shot, in 28lb. bags	19 0 0	,,	20 0 0
Copper Sheets, sheathing and rods	83 0 0	,,	84 0 0
Copper, British Cake and Ingot	79 15 0	,,	80 5 0
Tin, Straits	125 0 0	,,	126 0 0
Do., English Ingots	127 10 0	,,	128 10 0
Spelter, Silesian	27 0 0	,,	28 0 0

TIMBER.

Teak, Burmah	per load	£13 5 0	to	£16 5 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	4 7 6	,,	6 10 0
,, Oak	,, ...	4 10 0	,,	6 5 0
,, Birch	,, ...	2 5 0	,,	3 0 0
,, Elm	,, ...	3 17 6	,,	4 17 6
,, Ash	,, ...	3 2 6	,,	4 7 6
Dantsic and Memel Oak	,, ...	3 5 0	,,	4 0 0
Fir	,, ...	1 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	3 15 0	,,	6 5 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	4 0 0	,,	15 0 0
Sequoia, U.S.A	...per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 4½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£19 0 0	to	£25 10 0
,, 2nd	14 0 0	,,	17 5 0
,, 3rd	6 5 0	,,	10 5 0
Canada Spruce, 1st	8 5 0	,,	10 5 0
,, 2nd and 3rd	7 0 0	,,	8 5 0
New Brunswick	7 0 0	,,	7 15 0
Riga	8 10 0	,,	9 10 0
St. Petersburg	10 0 0	,,	16 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 15 0	,,	10 10 0
White Sea	11 15 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 11 6	,,	£0 14 9
2nd ditto	0 10 0	,,	0 11 9
Other qualities	0 5 3	,,	0 6 6
Staves, per standard M :—			
Quebec pipe	—		—
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per ton.	£20 5 0	to	£20 12 6
Rapeseed, English pale	,, ...	23 5 0	,,	23 10 0
Do., brown	,, ...	21 15 0	,,	22 0 0
Cottonseed, refined	,, ...	16 10 0	,,	17 15 0
Olive, Spanish	,, ...	30 0 0	,,	32 0 0
Seal, pale	,, ...	18 0 0	,,	18 5 0
Cocoanut, Cochin	,, ...	28 0 0	,,	28 5 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	24 0 0	,,	24 5 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6	,,	0 0 6½
Tar, Stockholm	per barrel	1 0 0	,,	1 6 6
Do., Archangel	,, ...	0 18 0	,,	1 0 0
Turpentine, American	per ton	28 15 0	,,	29 0 0

LIST OF COMPETITIONS OPEN.

Plumstead—Municipal Buildings and Public Library, Glossop-road (cost £40,000; E. W. Mountford, F.R.I.B.A., Assessor)	£100, £75, £50	Edward Hughes, Clerk, Vestry Hall, Maxey-road, Plumstead	July 27
Halifax—Twelve Shops, Commercial-street	£50, £25	Barstow and Midgley, Solicitors, 8, Harrison-road, Halifax	Aug. 1
Crystal Palace—Bandstand (Assessor)	30gs., 15gs., 7gs.	W. Gardiner, Sec., Crystal Palace Co., Sydenham, S.E.	„ 8
Watnall Chaworth and Watnall Cantelope—Sewerage Schemes		C. J. Spencer, Clerk, Public Offices, Basford, Notts	„ 17
Kircaldy—Infectious Diseases Hospital, Fosterton Farm	No premium	Alexander Beveridge, District Clerk, Kircaldy	„ 17
Wharfedale—Isolation Hospital	£30 (merged), £15	C. V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	„ 15
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 31
Dunoon, N.B.—Sheriff Court House (£5,000) and Police Buildings (£3,500)	£30, £20	M. Sinclair, County Clerk, Lochgilphead	—
Beeston—Church and Sunday Schools		C. Nichols, St. John's-grove, Beeston, Notts	—

LIST OF TENDERS OPEN.

BUILDINGS.

Scarborough—Detached Villa	G. W. Butterworth	J. Caleb Petch, Architect, Bank Chambers, Scarborough	July 22
Bella Vista—Detached Villa, Park-street		Edwin Foster, Architect, Bella Vista	„ 22
St. Ewe—Schools, &c.	School Board	Walter Giles, Architect, South House, St. Austell	„ 22
Beccles—Engine-House, &c., Castle Flour Mills		N. W. Pells, Beccles	„ 22
Richmond, Yorks—Additions to Premises	Robson, Wood, and Co.	Clarke and Moscrop, Architects, Darlington	„ 22
Tredegar—Additions to Primitive Methodist Chapel		Rev. J. Turner, 1, Rawlinson-terrace, Tredegar	„ 22
Boarden Barn Hill—Villa, &c.	J. Sanson	Procter Sherwin, Architect, Manchester-street, Boarden	„ 22
Robin Hood's Bay—Additions to Police Station		Walker Stead, M.I.C.E., County Surveyor, Northallerton	„ 22
Portmadoc—Additions to Snowdon-street School	Ynyscynhaiarn School Board	Owen Morris Roberts and Son, Architect, Portmadoc	„ 22
Keighley—Foundry, Greengate		John Haggas, Architect, North-street, Keighley	„ 22
Stockley Heugh—Eight Cottages	Wm. Lishman	H. T. Gradon, Architect, 22, Market-place, Durham	„ 22
Coedybrain and Castell Coch—Schools	Eglwyslan School Board	J. H. Phillips, Architect, St. John's Chambers, Cardiff	„ 22
Winchester—Additions to High School for Girls, North Walls		Thos. Stopher, F.S.I., Architect, 57, High-street, Winchester	„ 22
Dartmouth—Cart-Shed	Corporation	T. O. Veale, Surveyor, Dartmouth	„ 24
Leeds—Superstructure of Southern Higher-Grade School	School Board	J. M. Bottomley, Architect, 13, Bond-street, Leeds	„ 24
Croydon—Cowsheds, Beddington-lane	Town Council	R. M. Chart and Son, Architects, Katharine-street, Croydon	„ 24
Mynyddislynn—Additions to Schools	School Board	R. L. Roberts, Architect, Abercarn	„ 24
Hengoed—Villa		John Lloyd, Builder, Ystrad Mynach	„ 24
Dartford—Technical Schools	Urban District Council	G. H. Tait, M.I.C.E., Architect, Lowfield-street, Dartford	„ 24
Exmouth—Repairs and Alterations, Exeter-road Schools	School Board	F. E. Carter, Clerk, 1, Johnson's-place, Exmouth	„ 24
Mountain Ash—Rebuilding Welsh Calvinistic Meth. Chapel	Rev. U. D. Jones	T. Roderick, Architect, Ashbrook House, Aberdare	„ 24
Sandal Magna—Central Hall, &c.	School Board	William Watson, Architect, Wakefield	„ 24
Glasgow—Tenements in Stobcross, Clyde, and Piccadilly Streets	Corporation	The City Engineer, 64, Cochrane-street, Glasgow	„ 24
Liverpool—Excavation and Foundation, &c., Depot and Offices, Victoria-street	Lancashire and Yorkshire Ry. Co.	Henry Shelmerdine, Architect, Hunt's Bank, Manchester	„ 25
Hastings—School, St. Helens	School Board	Arthur Wells, F.R.I.B.A., Queen's Chambers, Hastings	„ 25
Whitechapel, E.—Enlargement of Fire Station	London County Council	The Architect's Department, County Hall, Spring Gardens, S.W.	„ 25
Leyton—Boiler-House, &c., Electric Light Station	Urban District Council	William Dawson, M.I.C.E., Council Offices, Town Hall, Leyton	„ 25
Fintray—Farm Steadings		Alex. Stronach, jun., & Son, Advocates, 20, Belmont-st., Aberdeen	„ 25
Catford, S.E.—Enlargement of Town Hall	Lewisham Board of Works	The Surveyor's Department, Lewisham Town Hall, Catford, S.E.	„ 25
Hucclecote—Schools	School Board	W. B. Wood, Architect, 12, Queen-street, Gloucester	„ 25
Penzance—Repairs, Public Buildings	Town Council	The Borough Surveyor, Penzance	„ 25
Brigham—Rebuilding Houses		J. N. Dickenson, Hames Hall, Cockermouth	„ 25
Manchester—Artisans' Dwellings (120), Knowsley-street	Lancashire and Yorkshire Ry. Co.	Henry Shelmerdine, Architect, Hunt's Bank, Manchester	„ 25
Exmouth—Detached Villa, Cyprus-road	Capt. Arthur	Philip Kerley, Architect, Exmouth	„ 25
Oxford—Girls' Central School, New Inn Hill	School Board	F. P. Morrell, Clerk, 1, St. Giles, Oxford	„ 25
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	„ 26
Wigan—Central Electric Station	Corporation	H. Collings Bishop, Engineer, Quadrant Buildings, Wigan	„ 26
Grimsby—Goods Warehouse and Office	Great Central Railway Co.	The Engineer's Office, London-road Station, Manchester	„ 26
Luddenden Foot—Two Shops and House		Thomas H. Mitchell, Architect, Strand, Todmorden	„ 26
Hendon—Repairs, Workhouse Buildings	Guardians	F. J. Seabrook, Clerk, Union Offices, Edgware	„ 26
Pontardawe—Enlarging Rhydyfro Board School	Llanguicke School Board	W. W. William, Architect, 63, Wind-street, Swansea	„ 26
Sheffield—Platform Roofing, &c., at Station	Great Central Railway Co.	The Engineer's Office, London-road Station, Manchester	„ 26
Warrington—Manure Store at Longford Depot	Sanitary Works Committee	J. Deas, Engineer, Municipal Offices, Sankey-street, Warrington	„ 26
Tullygoan—Parochial House	Rev. J. Gribbon, P.P., Banagher	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	„ 26
Brighton—Alterations and Additions to Public Library, Museum, and Art Gallery		Francis J. C. May, M.I.C.E., Boro' Engineer, Town Hall, Brighton	„ 27
Millwall—Public Baths, Glengall-road	All Saints' Vestry, Poplar	Clarkson Brothers, Architects, 136, High-street, Poplar	„ 27
Redruth—Residence at The Elms		Sampson Hill, Architect, Green-lane, Redruth	„ 27
Tolworth—Thirteen Cottages		Alfred Mason, Architect, Assembly Rooms, Surbiton	„ 27
Fletton—Schools	Baptist Church Trustees	William Boyer, Architect, Cowgate, Peterborough	„ 27
Southowram Bank—Sunday School and Caretaker's House		Joseph F. Walsh, Architect, Bank Chambers, Halifax	„ 27
Lancaster—Additions, Centenary Church		Robert Walker, F.R.I.B.A., Windermere	„ 28
Pontycymmer—Workmen's Institute	Flaldau Trust Fund	P. J. Thomas, Architect, Bridgend	„ 29
Kingston-on-Thames—Alterations, Assize Courts		Harold A. Winser, Town Clerk, Clattern House, Kingston-upon-Th.	„ 29
Chorley—Wing to Cottage Hospital		W. H. Dinsley, Architect, Cleveland-street, Chorley	„ 29
Leeds—Raising Roof, Chapeltown Tramway Depot	City Council	The City Engineer's Office, Municipal Buildings, Leeds	„ 31
Pontefract—Two Villas	John Shaw, J.P.	Garside and Pennington, Architects, Pontefract	„ 31
Kingston-on-Thames—Alterations to Old Workhouse Buildings	Guardians	William H. Hope, Archt., Union Offices, Portsmouth-rd., Kingston	„ 31
North Huish—Cattle-Houses and Repairs		T. Wakeham, Court, Aveton Giffard	„ 31
Leeds—Second Story to Kirkstall-road Tramway Depot	City Council	The City Engineer's Office, Municipal Buildings, Leeds	„ 31
Pontefract—Additions to House and Shop, Roper-gate	Stuart Lowden	Garside and Pennington, Architects, Pontefract	„ 31
Liverpool—Extension of Warehouse, North Mersey Goods Station	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	Aug. 1
Salop—Four Cottages near Marsh Brook Station	Joint Railways Committee	The Joint Engineer, Shrewsbury Station	„ 1
Peterson—Cottage at Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 1
Strabane—Business Premises		M. Hammond, Bridgetown, Strabane	„ 1
Oldham—Boiler-House, &c., Supply Station	Electric Lighting Committee	A. Andrew, Gas and Water Offices, Oldham	„ 1
Hereford—Extension of Roofing at Station	Joint Committee	A. E. Bolter, Sec. to Joint Committee, Paddington Station, London	„ 1
Swansea—Generating Station, Strand	Corporation	The Borough Surveyor, 13, Somerset-place, Swansea	„ 1
Petersfield—Laundry	Laundry Company	Arthur J. C. Mackarness, Secretary, High-street, Petersfield	„ 1
Brighton—Five-Roomed Artisans' Dwellings (28), St. Helen's-rd.	Town Council	Francis J. C. May, M.I.C.E., Town Hall, Brighton	„ 2
Sutton-on-Trent—Laying Floor	School Board	T. E. Day, Clerk, Sutton, Notts	„ 2
Darwen—Central Stores	Provident Co-operative Soc. Com.	Sames and Green, Architects, Knott-street, Darwen	„ 2
Lisnaskea—Five Labourers' Cottages	Rural District Council	J. O'R. Hoey, Clerk, Rural District Council, Lisnaskea	„ 5
Friarton, Perth—Gasworks	Gas Commissioners	A. Gillespie, Engineer, 34, St. Enoch-square, Glasgow	„ 5
Burntisland—Secondary School	Burgh School Board	Robert Little, Architect, 4, St. Brycedale-avenue, Kirkcaldy	„ 5
Sheffield—Additions to Car-Sheds	Tramways Committee	Charles F. Wike, C.E., City Surveyor, Town Hall, Sheffield	„ 8
Hendon—Repairs to Workhouse Buildings	Guardians	F. J. Seabrook, Clerk, Union Offices, Edgware	„ 9
Mayford, near Woking—Manual Room, and Alterations to Swimming Bath at Industrial School	London County Council	The Architect's Department, 13, Spring Gardens, S.W.	„ 10
Bermondsey—Alterations to Town Hall	Vestry	The Surveyor, Town Hall, Bermondsey, S.E.	„ 10
Swansea—Engine and Boiler Houses	Harbour Trustees	A. O. Schenk, Engineer, Harbour Offices, Swansea	„ 10
Tranmere—Wing to Holt School of Science and Art	Birkenhead Corporation	C. Brownridge, A.M.I.C.E., Boro' Engr., Town Hall, Birkenhead	„ 15
Filey, Yorks—Coastguard Buildings	Admiralty	The Coastguard Station, Filey, Yorks	„ 18
Kirkwall, Orkney, N.B.—Coastguard Buildings	Admiralty	The Watch Room, Coastguard Station, Kirkwall, N.B.	„ 18
Southend-on-Sea—Technical Schools and Fire Brigade Station	Corporation	Wm. H. Snow, Town Clerk, Southend-on-Sea	„ 21
Malmo—Electricity Works		The Gasworks Directors, Malmo, Sweden	Sept. 1
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	„ 12
Omagh—Residence, Killyclogher-road		James L. Donnelly, Architect, 2, Bridge-street, Omagh	—
Cork—Stables	N. Ross	Arthur Hill, B.E., Architect, 22, George's-street, Cork	—
Tanfield—Wesleyan Chapel		W. J. Morley, F.R.I.B.A., Architect, 269, Swan-arcade, Bradford	—
Coventry—Alterations to Premises, Cross Cheaping	Matterson, Huxley, and Watson	Harry Quick, Architect, 64, Hertford-street, Coventry	—
Oswestry—Kilns and Machine-House		Sweeney Blue Brick and Terracotta Co., Ltd., Oswestry	—
Griffithstown—Two Houses and Shops, Windsor-street	F. E. Jenkins	J. Francis, Architect, Abergavenny	—
Knowle—Two Houses		John Johnson, Architect, Unicorn Hill, Redditch	—
Gateshead—Additions to Higher-Grade-School	School Board	Geo. Bell, Quantity Surveyor, Westgate-road, Newcastle	—

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UNREST IN MODERN BUILDINGS.

WITH our wealth of materials, our varied tastes, and our numerous sources of decoration, it is scarcely surprising to find that the architecture of the day has become more profuse and restless in its character. Our more costly buildings naturally reflect the superabundance. The plain, well-proportioned façade, adorned by one or more "Orders," is no longer the conception of our modern builders and their patrons. The building must bear evidence of the wealth or prosperity of the owner, the resources of the manufacturer, art competition, and the fashion of the day. Good proportion, like good breeding, is not so important as those qualities, which serve to arrest attention, such as an assertive style and an obtrusive display of ornament. East and west we find these characteristics—in the Mile End-road as well as in Brook-street and Duke-street. Latterly the dome or cupola craze has taken possession. We see it in the large block of shops and offices lately erected at the top of Regent-street, where an ambitious dome, not devoid of merit, crowns the centre of the block, and marks the site of the demolished Classical church designed by the late Professor Cockerell. No large commercial building is now complete without its turret or cupola, and a cluster of these adjuncts may be seen adorning a new block of commercial buildings occupying the site of the old Elephant and Castle at Newington Butts. In this latter instance the cupolas are covered with copper, a very excellent material that is not so largely used as it may be as a decorative covering. At the Carlton Hotel, Pall Mall, a very elaborate Renaissance building is crowned by a square dome of dignified proportions, corresponding to a similar dome over the centre of Her Majesty's Theatre, that forms a wing of the same building in the Haymarket, the elevation of which front we gave lately. There ought, of course, to be a motive for a large dome. A central staircase or hall, an inner court or quadrangle, as in this hotel, at once supplies a motive; but the dome is meaningless merely as a part of a roof, terminating no particular feature. The small cupola should also, if possible, be made to crown a corner, a stair turret, a hall, or some internal arrangement; but we now see it placed almost anywhere: over a bay window or corbelled out, placed over a corner oriel, and, in short, introduced as an ornament over public-houses, blocks of residential flats and shops. It may be made useful as a ventilating outlet, as a means of access to the roof, or as a clock-tower; but to whatever purpose it is applied, it ought to be in harmony with the building and with the immediate object of its design. But how very few satisfactory examples we can point to! They are generally erected simply to arrest attention: to give a fictitious importance to the building, or for the purpose of ornament, and to this extent they are failures.

Broken skylines are always acceptable accompaniments to our public buildings when they are natural and are the outcome of the building; but they are intensely irritating and fidgety when they are affected or made up. Piled-up Mansard roofs, broken gables, dormers, and terminals are seen over many new façades for the sake of display merely, and these accessories are not combined with any discretion or taste. Sometimes we see a number of broken gables jostling together or mixed with chimney-stacks and dormers. It is not so easy to affect naturally and spontaneously the picturesque outline and beauty of detail of the Palais de Justice, Rouen, with its wealth of high storied dormers and pinnacles forming a fringe of beautiful open traceried work backed by the roof behind, which is exactly the same height as the finials of dormers. Although so elaborate and rich, there is, at the same time, extreme complicity in the alternate bays of dormers and arcaded pinnacles. When we look at the work we cannot call it redundant; there is a pleasing rhythmic proportion observed throughout the façade. There is rhythm in the lines and curves of the flat-arched windows; the Burgundian convection is to be seen in them, and there is rhythm in the junction of straight with curved lines to be found in the upper part. The commercial architecture of the day is utterly oblivious of all rhythmic design. We see arcs and curves joined to straight lines producing the most harsh combinations, straight lines of roofs forming acute angles with vertical features.

Numerous buildings of recent erection may be pointed to which defy all rules of harmony in the design of their façades: they are crowded with details of a coarse or redundant character. The parts hang badly together, the fenestration is a mixture of all kinds of form; no coherence of design is apparent. The commercial building and the modern public-house and hotel style defy all principles of design; they are exuberant in feature and detail, and "loud" in character. There is nothing restful in them. In nearly every important thoroughfare we may see examples of rebuilt hotels; restaurants which have nothing in common with the old-fashioned hostel or inn and its quiet and restful air, its small-paned windows, or projecting comfortable bays, and overhanging signs, the interior rooms of which were often low but spacious, the wainscoted walls, panelled beam ceiling and seats. All have given place to a style of building at once restless and repugnant to all comfort, crowded with excessive detail, ornamental wood fittings of an overdone or baroque kind, and tawdry decoration in glass and metal. The expensive fitting-up and decoration of these houses may be seen by one recently rebuilt at the corner of Duke and King Streets, St. James's. Externally the design competes with the costly public building; the elevations are in stone, and the details fairly good, but there is an exuberance of detail not in keeping with a house of this character. A corner turret and cupola adorn the angle between the two streets, all of which contrasts strangely with the sombre brick houses adjacent. Of a more pretentious character are the new Carlton Hotel in Pall Mall, and the new Claridge's Hotel in Brook-street. In the latter we find excessive detail and carving on the upper stories, much of it lost to view, or that will soon become obscure and black in the London atmosphere. It is a fair example of modern London hotels of the higher class—certainly an improvement on the skin-deep stone pilaster and surface ornamentation of the Hotel Cecil.

The employment of decorative material in these modern examples of architecture is also excessive. Every new manufactured decoration must be used to saloons, vestibules; *salles-à-manger* display all the latest things in decorative plaster and wood work, electric-light fittings, and other accessories. There is a desire to be "up to date," and with it a restlessness to exhibit every new device. Externally the building shows the same restless character; there must be polished granite and marble, carved stonework, gauged and carved brickwork, modelled terracotta, and glazed-tile decorations. Yet we feel that we do not get due satisfaction out of these materials. First, they are mixed up together without reference to adaptability. Second, there is the modern mechanical neatness, the desire to hide every joint and to smooth every surface; the moulded and modelled terracotta is made insipid, the ornamentation of the panels and enriched members is often too elaborate and highly finished for the situation. Third, the detail of moulding and the carved ornament are excessive; the ornament overloaded where it ought to be sparse. Fourthly, the materials are obtrusively introduced without any reference to harmony of colour.

The decorative use of materials leads us to speak of another matter. One of the chief sources of decorative effect very much neglected is what has been aptly called "texture" in architecture—that quality of surface which is independent of designed form or colour. What constitutes the textures of our buildings? They are the natural surfaces of our materials—the effects of tooled surfaces, the grain of woodwork, the roughness of granite or sandstone, and the veinings of marble. To produce texture of our stone or brickwork, we may leave them as they come from the chisel or the saw to exhibit the fracture or surface of the material. Another form of texture is derived from the jointings of our brick or masonry walls and the courses of our tile and slate roofs. Even the smaller architectural details and ornament in the distance give a sense of texture or a variegation of surface, such as rustications, diapers, and panelling. These are boundless opportunities open to the architect; in the humblest building the texture of material may give us all we desire, and may even atone for loss of detail. Each step nearer the building reveals a finer texture. But there are discords to be avoided. We are in the habit of mixing smooth and polished granite, glazed tiles with rough brickwork, smooth terracotta with brick dull and grimy, all of which disparities and contrasts rob our architecture of its meaning. The polished granites of piers or pilasters or entablatures which adorn our large shops and conceal the iron stanchions and girders are often discordant elements with the stone or brickwork of the façade above; they look out of scale in their jointings with the rest of the work, and their smooth and polished surfaces do not afford any advantages with the plate glass they enframe. The monotony of the smooth glazed surface of the lower part of the building strikes a discordant note with the upper part, and is contrary to all natural law. It would be more fitting to see the smooth surfaces in the upper stories and the rougher materials below, but modern fashion has ordered it otherwise. It has been well said the passion of the 19th century is for "neatness and smoothness," but in our effort we lose the law of Nature, of texture. The ordinary man loves the smooth; he admires an expanse of plate-glass and polished marble, French-polished oak and mahogany, tuck-pointed brickwork with ochre-washed bricks, to a uniform deadness of tint, neatness in every joint; just those things which make art monotonous and violate the law of nature. Texture has been said to be a "magical garment when well woven.. It can throw over bricks and stones a veil which softens their outline, half-concealing and adding mystery to beauty."

THE SELECTION OF CONTRACTORS.

IT is a well-merited remark that the encouragement given to good building is small. The public are not discerners of it—they go to the cheapest market they can, buy the cheapest houses, and go to builders who will build them what they want at the lowest possible cost. The class of "jerry" builders' work which lets and sells is a proof of this rule. Most people are too short-sighted to see that cheap building is the worst investment: it means a yearly expenditure in repairs which is continually increasing, or the more serious cost of impaired health. How few people who have purchased their own houses have not been put to a large expense in taking up the old and defective system of house drains, and in laying down a sanitary system by order of the local authority? Many have been put to a large expense in repairing roofs, to render them watertight; in making their cellars and basements dry and habitable. Still the infatuation goes on of buying new, scarcely-completed buildings, with green brick walls and floors and ill-drained basements, under the impression that bargains are made. Such people never think of the circumstances which induce builders and others to sell their property. Is it not in most instances a knowledge of the deterioration of the value from some cause or other, some prospective building opposite or a filling-up of an open space, the destruction of a pleasant prospect or trees in the immediate vicinity, the building of shops? Or the owner sees what he will have to do if he retains the property—that he will have to undertake costly repairs to make the house habitable. Mr. Smith, on the look-out for a cheap house, has not the faintest idea of these things: he imagines the low price offered for immediate purchase is owing to some financial difficulty on the part of the vendor, and that there is now an opportunity that may never occur again. The purchase is completed, and the vendee too soon discovers why the house was sold at so low a figure. But it is not always the purchaser of houses that shows himself unable to judge of good building. The man who contemplates building himself goes to work in the same heedless manner; he employs a small builder to give him a plan and a tender for a new house, for he does not believe in the employment of an architect for so simple a matter. Again, it has been pointed out that the public sees no difference between the conscientious and honest and the evasive contractor, but will employ the man who sends in the lowest tender, whatever may be his character. And do not the selection of tenders for work corroborate this assertion? How frequently the employer, against all remonstrance from the architect, selects the contractor for his tender, and not for the quality of his work or his repute as an honest builder. This is one of the standing grievances of the profession and of all honest builders.

We have repeatedly been told by honest contractors of the uselessness of competing against men who have no credit or reputation, but who invariably send in low tenders and generally obtain the contract. We have here a strong corroboration of the opinion that the public do not appreciate as they ought to do honest construction and labour. This condition of things is not unknown in the United States. The other day an American contemporary referred to a letter of a firm of contractors who complained that they were now obliged to compete with builders who take work for less than it will cost, hoping to get out of their engagements by evasive practices. The same writer says the champions of labour use their influence in municipal matters to get work for men who pay the lowest wages, or are otherwise dishonest, and thereby exclude the honest contractors who pay the highest union wages. It is also a complaint, too, that in public contracts in the United States the architect is not consulted in the choice of the contractor, who is selected because he is the lowest bidder, or by some secret understanding with the officials. So general is this said to be the case, that in public works reputable builders have ceased to bid on such work. The architects have to fight hard to get the honest tradesman selected, and then they have to resist attempts to deprive him of his contract. The dishonest contractor can only bid lower than the honest man because he does not pay for materials and labour, and tries to substitute for what he has agreed to do something very different, if he can only pass it through undetected. These are his tactics. Perhaps we have less to complain of in this country;—the architect has some little authority in the decision of a contractor, but the grievance is not unknown amongst us. The lowest bidder is too often successful in ousting better men from the field, and, in fact, the higher class of builders have ceased to compete with men of the class we have described, who enter the competition with the object of trying to substitute inferior materials and workmanship for those specified. How can an equal and fair contest be maintained with men who seek to adopt their own standards? The contract is made a mere farce by men who base their tenders on ignoring specification altogether, and who trust to fortune not to be found out. No doubt these dishonest bidders, sooner or later, find their one reward; but in the mean time they make it extremely hard for young and respectable firms to hold their own. The fault lies in the public indifference to honest and sound construction—to the desire to obtain what is wanted on the lowest and most unprofitable terms. The public and those authorities who control public works are really abettors of the practice, by selecting tenders that their own professional advisers know are unremunerative. The want of influence of the architect in the selection of reputable contractors is much to do with this miscarriage of justice; he has no voice in the matter, and it is a foregone conclusion that the lowest tender will be accepted.

ESTIMATES.—XV.

THE JOINER.

An expeditious and useful method of taking and valuing Carpenter's work is that of taking the superficial of roofs, floors, partitions, &c., at the square of 100ft. for labour and nails, and then add the cube contents of the timber without labour. For approximate estimating when the timbering is light and rough, this method has advantages, and we may take a few items measured in this manner:—

8 squares 62ft. super. Labour and nails to ground fir joists, pinned to plates, and framed to chimneys.

For the labour we use the constant for labour hours 7·0, which gives us at the current rate of wages 5s. 10d. per square; add to this nails, say, 1s. 9d. = 7s. 7d. These include profit.

	£	s.	d.
Labour (hours of carpenter, 7·0 constant)	0	5	10
Nails, say	0	1	9
Cube fir, without labour, taking the joists at 9in. by 2in., or say 11ft. 6in. cube in a square at 1s. 3d. per foot	0	14	3
Total per square	1	1	10

Laxton puts the labour for a square of flooring of this description as 9s.

3 squares 10ft. super. Framed ground joists, with girders, binders, bridging, and ceiling joists.

There is more framing in this item. The constant is 21·6, equal to 18s. per square; add nails (say 5s.) equals £1 3s. for labour, to which add cube for "without labour" as before.

	£	s.	d.
Labour (hours of carpenter, 7·0 constant)	0	18	0
Nails, say	0	5	0
The cube fir would be increased; there would be one girder to the square, about 7ft. 6in. cube, and say one binder. These are placed about 6ft. apart, and with the bridging joists, say, the additional timber is 10ft. cube, then at 1s. 3d. per foot	0	12	6
Joists as before, say	0	13	9
Per square	2	9	3

In calculations of this kind, it is useful to have a table showing how much cube fir there is in a square of flooring for single-joist floors, framed floors, floors with bridging joists, double framed floors, including girders, bridging, binding, and ceiling joists, &c.

5 squares 12ft. super. Labour common floor, with joists.

This may be put at 4s. 6d. for labour, including nails; the constant is 4·5 for labour only.

36ft. run. Herringbone strutting to joists.

Put this at 1½d. per foot run.

55 squares, 32ft. super. Common shed roofs, with purlins, labour only.

This may be priced at 5s. 8d. per square. The constant is given at 5·0 for labour = 4s. 2d., to which add, say, 2s. for nails.

80 squares, 30ft. Single span roof over offices.

Price this at 7s. 9d. labour and nails, if there are purlins, and the building is, say, two stories high. The constant is given at 10·6 = 8s. 10d., but this price includes principals.

56 squares, 80ft. super. Labour in framed roofs, with principals, king-posts, struts, purlins, and common rafters.

It is necessary to see drawings. If it is an ordinary king-post roof, 15s. per square is a fair price. Constant is 17·6 = 14s. 8d., with nails 4s. = 18s. 6d.

Much depends on the scantlings of timber, and we have assumed the ordinary sizes. In all the above items the cube quantity of timber must be obtained and priced, and added if necessary.

Four squares 80ft. super., labour and nails to 4in. partitions.

	£	s.	d.
Take 6·0 as constant for labour	0	5	0
Nails	0	0	9
	0	5	9

Three squares framed and trussed with king and queen posts.

This description applies to partitions with 6in. posts and framed studs. Laxton put labour down for trusses of this description at 16s. 9d. per square.

	£	s.	d.
The constant for labour hours is 12 3 = 10s. 3d.	0	10	3
Nails, say	0	3	0
	0	13	3

Laxton prices this at 16s. 9d.

It is desirable to obtain the cube feet in so many feet of scantling before valuing the timber in the rough. For rafters of common size, 4½in. by 2½in., it will require about 13ft. run to make a cubic foot. For timber, 7in. by 2½in., or battens, it will require about 8ft. to make a cubic foot; a scantling 8ft. by 5ft., will require about 4ft. to make a foot.

In roofs having framed and wrought trusses at intervals, it is necessary to obtain the cube feet and cost of each truss, taking the average of one truss at, say, 10ft. length. Suppose the truss contains 12 cubic feet of fir, and one bay of roof 3 squares each of 6ft. cube, then 18ft. cube + 12ft. cube = 30ft. The wrought surface would measure about 7ft. per foot cube, and 7 × ·010 × 100d. = 7d. per foot cube, and this must be added to the cost of fir per foot cube, say, 1s. 3d. + 7 = 1s. 10d.

JOINER.

Joinery is generally prepared at the workshop and sent to the building to be fitted and fixed, unlike the Carpenter's work, which is framed at the building. The wood used for joinery must be of a superior description, as it is more wrought and finished. It is largely wrought by machinery and planed, and in large contracts it is not unusual to let out the joinery to special firms who have a large plant of labour-saving machines, and who can supply the joinery at a considerable percentage less than the contractor can produce it, especially if the quantities are large.

In the valuation of Joiner's work the element of labour enters more largely than in carpentry, and the pricing of items may be facilitated much by the use of constants of labour.

In the pricing of joinery, the cost of deal of various thicknesses is essential, and a table of such thicknesses should be referred to.

The best St. Petersburg or Onega yellow is generally specified for good work, and these deals are now quoted at from £12 to £14 per standard. At the dock sales, these deals may be often had at the former price. Before pricing the items, we must assume a fair price for deals at the docks, adding thereto the landing rates, unloading, cartage to or from saw-mills, and a certain interest say 5 per cent. for the time required to season the wood, also waste.

	£	s.	d.
Cost of deals at docks, per standard	14	0	0
Landing rates	0	3	9
Unloading	0	2	0
Interest on £14 5s. 9d., say, two years at 5 per cent. for seasoning	1	9	3
Waste, 10 per cent. on sawing......	1	11	6
	17	6	6

Assuming the price per standard to be £17 6s. 6d., the cost of sawing per foot super. may be obtained as follows:—Take a deal 9in. by 3in. and 12ft. long = 666 super. feet of 3in., and let it be required to find the cost of ¾in. of rough deal per foot.

For ¾in. thicknesses there would be three cuts in 9in. by 3in. producing four boards of that thickness = 222 cuts = 18½ dozen cuts at 2s. 3d.

	£	s.	d.
Cost of deals, per standard	17	6	6
18½ doz. cuts, at 2s. 3d.	2	1	7½
Divide by product of 666 × 4 = 2,664ft. = 1¾d. per foot......	19	8	1½

Adopting this calculation for 1in. rough deal, there would be two cuts in the same scantling, producing three boards, or 12⅓ dozen cuts at 2s. 3d., and the cost per foot would be—

	£	s.	d.
Cost of deals per standard	17	6	6
12⅓ dozen cuts at 2s. 3d.	1	7	9
	18	14	3

Divide by product of 666 × 3 = 1998ft. = 2¼d. per foot = 18s. 10d. per square.

We may apply this mode of calculation to ascertaining the cost of flooring of any thickness, adding the element of labour and nails. For a square of 1in. yellow batten flooring the items are—

	£	s.	d.
Cost of deals per square, including sawing......	0	18	10
Labour and days of a carpenter, ·400 =	0	3	4
Nails......	0	1	9
	1	3	11

This is rather high for ordinary work, and may be taken at £1 2s. 0d.

6 squares 16ft. super. 1in. yellow deal wrought floor, laid folding.

This may be priced at about £1 3s. per square, including profit.

According to present prices, 1in. prepared second yellow 6½in. and 7in. wide are 8s. to 9in. per square.

	£	s.	d.
Cost of deals delivered, say	0	12	0
Waste, 10 per cent......	0	1	2½
Labour (carpenter, hours constant, 6·8 = 68d. = 5s. 8d.)	0	5	8
Nails......	0	1	9
Per square	1	0	7½

5 squares 10ft. super. 1¼in. wrought batten floor laid folding.

If for best yellow battens, this will be as follows:—

	£	s.	d.
Cost of prepared battens, 1¼in. delivered	0	17	0
Waste, say......	0	1	8½
Labour (carpenter)	0	5	8
Nails......	0	2	0
	1	6	4½

Laxton prices a floor of this description at £1 9s. per square.

3 squares 80ft. super. 1¼in. yellow batten floor, straight joint, with splayed headings.

	£	s.	d.
Cost of battens per standard is about £14 10s., including carriage, sawing, and waste, or about 25s. per square......	1	5	0
Labour, 8·8 hours	0	7	4
Nails......	0	2	0
	1	14	4

This is rather low for the best work. Laxton puts it at 40s. per square.

6 squares 20ft. super. 1¼in. pitch-pine floor in 4½in. widths, grooved and tongued, and tongued headings.

Pitch-pine is quoted at from £8 to £12 per standard.

	£	s.	d.
Cost of pine, including carriage, sawing, and waste per square, say......	1	10	0
Add for labour in 4½ widths	0	6	0
Labour, as before, fixing	0	7	4
Constant for tonguing and grooving, (·590 days of a carpenter)	0	5	0
Galvanised hoop-iron tongues (say 24lb. of ⅞in.) say......	0	4	0
	2	12	4

One price book puts this item at £2 15s. per square.

32ft. run. Glued and mitred borders to hearths to 1in. floors.

This may be priced at 3½d. to 4d. per foot run, and for 1¼in. floors at 5d.

190yds. super. wood-block flooring to basement with Geary, Walker, and Co.'s yellow deal A quality, 1½in. thick.

According to list this can be laid complete for 5s. 9d. per yard, exclusive of carriage.

70ft. super. 1in. parquet flooring and border, in herringbone oak pattern.

The price for this kind of flooring ranges from 1s. to 3s. per foot super.

Messrs. Damman and Washer and Co., of 72, Finsbury-pavement, supply a plated parquet floor, which can be put down in large pieces 100ft. super. or more, ready for fixing. It is made of ¼in. wainscot oak fixed to a ¾in. backing of deal, which is framed in small pieces to prevent warping. The price is from 2s. per foot.

NATIONAL COMPETITION DESIGNS.

THE yearly exhibition of selected works of Schools of Science and Art at South Kensington continues to show advance on previous efforts. We see less that is commonplace or trite in idea, and a desire to think out the design from a right motive. We reserve for next week a more general review of the designs, and here briefly refer to a few of the architectural designs, and those in Subject 23c. The architectural designs are not up to the average standard. A Design for a Mausoleum, which receives a gold medal, by William Haywood, of the Birmingham School of Art, is decidedly disappointing. The general conception is heavy and uninteresting; the plan is a square, and has a flat panelled appearance on each side, scarcely in keeping with the object of a mausoleum, which should be more solidly treated in detail. The best part of the design is the treatment of the internal shrine, which is shown by a clever inch-scale drawing. The section shows an arcaded gallery round the first story above the memorial chapel, and above this is an open colonnade. The centre part is domed and pierced by openings over the flat colonnaded roof which runs round on each side, and there are many good points in the plan and section; but why the unconventional green sectional and plan colour? The intersecting device over the entrance is commonplace. This is the only architectural design awarded a gold medal. Another drawing for a mausoleum is too pretentious, and the intercolumns too narrow.

A design for a church on a hill-slope receives a bronze medal, by F. J. Horth, a Birmingham student. The design is bold and massively treated; there are deep reveals to the windows and belfry openings, which are appropriate. The tower is at the west or lower end of slope; but some of the details are faulty. A silver medal is given to the same student for a design for a technical school, which evinces some good planning, and the departments are well thought out. The elevations in pencil scarcely do justice to the design, which is of a Late English Renaissance character. Another carefully executed set for a technical school receives a bronze medal, by Horace J. Ash, of the same place. The plans show usual arrangement, but are faulty in parts. Other designs for village or hillside churches are hung; one is by Harry Phibbs, of the same school, and shows a large massive tower at end of nave, with a flight of wide steps and transepts. There is a breadth of treatment, but the details are poor. A bronze medal is also given for a small village church, in brown ink, not without merit, by another student. Book prizes are also given to a simply treated mountain church with low tower over east bay of nave and small spire, and to a study for a modern church in a very florid Gothic, finical in detail. An ambulatory on the north side is shown for processions. A broadly-treated hillside church takes the same prize, by Gascoigne. A concert-hall is the subject of a design by a Glasgow student, J. T. Houston, a plain Classically-treated and well-grouped building with massive square towers and cupolas at corners, and with engaged columns at sides, with a deep sculptured figure frieze. The auditorium is circular, surrounded by a corridor and a large vestibule and *porte cochère*. The plan is defective in detail, and the lighting not perfect. A bronze medal is awarded.

A clever, broadly-drawn sketch, colour-washed, for a village inn, by Shirley Harrison (Leicester), in brick, timber, and plaster, takes a bronze medal. The author is an adept at his pencil; but the design is more pleasing than practical. The plan is well studied and broken.

The design for hall of railway station (bronze medal) is too fanciful; the pictorial panel treatment round hall is out of place. A silver medal is awarded to an interior study of decoration in enamelled and embossed faïence in shades of green, the pieces being modelled to shapes to avoid square joints. Designs (bronze medal) for bank and club, a gabled stucco front between red-brick piers, rather brightly coloured; for a country house, with a succession of half-timbered receding gables; and for a town-hall, neatly-drawn set but commonplace. A silver medal is given for a font to be executed in Irish green marble, with bronze panels and wrought-iron cover, cleverly and simply treated. A boat-house, village inn, &c., are other subjects. The examiners express, what we have often done, that it would be well if masters set their students less ambitious subjects than large churches and town-halls, which are beyond the capabilities of their pupils. Some of the designs for technical school, concert hall, and churches show imperfect plans, faulty construction, or an attempt at a too-elaborated style.

Coming to the designs of other subjects and decorative treatments of materials, we can notice only a few now. We find a few praiseworthy efforts; still, as the examiners of wall-papers, stencil designs, and ironwork designs point out, few even of the better designs "could be executed by the ordinary methods of manufacture."

A silver medal has been deservedly given to a set of designs for electric lamp-posts in cast iron and bronze, which are elegant, and show a proper adaptation of metal forms. The three latter designs are very nice; they are by

Thomas Smith, of Leicester. The iron gate designs are of varying merit; we especially mention the silver-medal set by George E. Kruger, of Bath, which show restraint.

Two designs for friezes are worth notice. A silver medal is given to Nellie Brightwell for a design for a nursery paper, in which the idea of paper has not been lost sight of. The subject is from the well-known nursery rhyme of "Merry Blackbirds," and the figures are introduced in pod-like niches at intervals, with a band of foliage and flowers uniting them. The waving line of birds is gracefully introduced along the top. Another clever design with playing children takes the same prize by Roberta Glasgow, of Liverpool. We also notice a design for panels of quiet and chaste character by Bessie Norton, Putney, for gesso, for which a silver medal is given; a gold medal has been awarded to a Manchester lady student, Jennie Delahunt, for a modelled design for a ceiling, displaying much taste and skill. It is groined with low-relief figure subjects in the spandrels between the covings; the ceiling is refined, and the decoration also in flat relief. Other modelled designs we notice include a work by a lady student, Edith Church Maryon, for a design for a triptych, quiet in treatment, suitable for the purpose (bronze medal); and another by Ernest G. Gillick for a treatment of a bandstand pedestal with figure representing one of the Muses (silver medal). Several very clever stencil designs are exhibited, in which, as the examiners say, the conditions are observed, though full advantage of the legitimate use of the stencil is not always taken; we must not omit to mention a nice treatment by a Liverpool student (No. 331), and a design by William J. Medcalf for a frieze of hall, which receives a gold medal. Other wall-paper designs we must notice next week. A design for a bachelor's room, clever and simple in treatment, and quaint, receives a silver medal, by a well-known student from Holloway (G. M. Ellwood), and we notice some capital book illustrations by Sunderland Rollinson, Scarborough, of whose work last year we give this week a double-page sheet of illustrations.

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"BUILDING NEWS" DESIGNING CLUB.

A GOLF CLUBHOUSE.

WITH the increasing popularity of the fashionable game of golf new links are being opened leading to a variety of pavilions and clubhouses being erected. The subject, therefore, has a special interest of its own, and, besides this, the problem presents opportunities for the display of variety and originality in architectural taste. The majority of the designs on the present occasion have failed, however, because their authors seem to be fettered by the mistaken notion that a golf pavilion should be made to resemble a villa residence as much as possible, instead of striving to give the building as much individuality as its distinctive requirements naturally would suggest. The power of being able to realise such a commonsense view of the problem, irrespective of precedent, and of being able to simply plan and build a structure for its particular purpose, is seemingly the rarest of gifts, and possibly the real reason for this is the uncommon faculty of good taste. Professors may lecture, reviewers may criticise, examiners may examine, and examplers may exemplify, but much as may be done to improve the student's sense of proportion and fitness, thereby popularising a degree of better design, no number of designing clubs can realise a royal road to real success in this the highest standard of architectural art. The same rule is applicable to all buildings irrespective of their size; but, undoubtedly, the more monumental the building the more difficult the application of the rule. The capacity of successfully mastering a big thing, however, will more naturally follow upon experience gained by more modest essays.

A golf clubhouse, a humble subject enough, therefore, should by no means be despised, and if we cannot hold up either of the schemes before us as worthy of imitation, we do not in the least degree undervalue the care and executive skill illustrated by the drawings before us. "Tokio" seems to be the best, "Thistle" comes next in merit, and then "Swan." The instructions were as follows:—H.—A golf club pavilion for links near the sea on a flat site, well protected from the north by a belt of trees and high ground. The general room to be 30ft. by 26ft., and a small bar-parlour with counter, leading out of the entrance-hall lobby, and opening by a doorway into the clubroom. There is to be a ladies' room about 18ft. by 14ft., with separate entrance lavatory and w.c. Provide a club dressing-room 14ft. by 12ft., and a drying-room adjoining, as well as a lavatory, urinals, and w.c. On the first floor there is to be a luncheon-room 30ft. by 18ft., with covered balcony 12ft. deep on the south-west side, partly projecting over the front wall below and carried by brackets, not posts. The room for committee to be on this floor. A club kitchen and a bedroom to be contrived for an attendant and his wife. Materials: Red brick, stone, and timber, with tiled roof. The front to face south-west. Scale 8ft. to the inch. Sketch view to be included. The plans, if necessary, may be shown to one-sixteenth scale.

The drawing with which "Tokio" illustrates his scheme is not so good as it might be. The strange comet-like treatment of the sky in the perspective is foolish, and we have left it out. We do not say either that we are charmed by the elevation; but, at least, the building does not pretend to look like a dwelling-house. The plan is far from being perfect. Its faults are evident. The cramped bar is one of the most conspicuous. By slightly shifting the fireplace in the men's dressing-room the doorway to it could have been sufficiently screened from the bar without the necessity of the present lobby, which encroaches so badly upon the bar space. The front entrance should have been made more of, and the clubroom doorway directly leading into the open air might with advantage have been omitted, the clubroom being approached from the main entrance lobby. Many other details of the ground-floor plan could be modified with advantage. Upstairs, the small bay room called "ante" is rather purposeless, and, as a secretary's room, it is not well placed or convenient. The building externally is too crowded with features, and the flat weathering over the ladies' room bay is not a happy contrivance. So much for fault-finding, which may be easily carried further by the critical reader. The design, taken on the whole, is the best in our opinion, and thus no choice is left us but to place it first.

"Thistle" makes his entrance-hall the bar, and as the stairs rise immediately in front of the counter which projects into the hall, the arrangement is by no means satisfactory; while everyone going and coming into the clubroom would have to push through the members standing in front of the bar. The alcove recess round the corner out of the clubroom and crowded in under the stairs, hardly appears necessary. There is much space wasted in corridors and passages. The place for caddies is a necessary convenience; but if provided for they should have a w.c. and lavatory. Externally the elevation of the building is too much like a dwellinghouse. The scheme is fairly well delineated and carefully worked out. "Swan" has many good points and with more attractive drawings would have stood a better chance for illustration. The bold big roof over his building spanning the verandah would look well; but the condition of cost must weigh with an assessor even in determining upon the merits of designs like these not immediately prepared for execution. Economy and the ordinary considerations of every-day building must be recognised. "Swan" has the merit before remarked upon of having given his club an individuality, though it looks a trifle too much like a pavilion merely. The stone facings to his raking buttresses are in some cases shown much too thin. The masonry should boldly tail into the wall: a mere skin of stone would break away, and if it did not do so, the effect, anyway, would be horrid. Swan's plan is squarely contrived and well arranged. The bar counter is a little awkward, being too much in the corner of the hall, which apartment otherwise is roomy and convenient.

"McGilligan" is too ambitious in his plan, and though unsparing in features of solidly-built character, their numerical strength detracts decidedly from the good effect of the whole. The two corner porches, with a pier at the angle, are not pretty. The bar is cramped and uncomfortable. The hall is wasteful; in fact, the plan is lacking in the compactness and cosy club conveniences generally expected even in a club of this kind. "McGilligan" draws crisply and evinces care, but he has not surpassed the hill-side church with which he led off the B.N.D.C. session last autumn. "Speys" is less aspiring, and hardly competes with the contributor just named for draughtsmanship. He allows himself to be fettered too much by the commonplace—a feeling which distinguishes the plan and mars the elevation. For all that, "Speys'" clubhouse would look far better if built than "McGilligan's." The luncheon-room is put the wrong way on, and the kitchen is very badly located in the front of the building between the balcony verandahs. The bar is a mere cabin-hole, and convenience generally is lost sight of too much. "Arc" gives us a turret marking the staircase hall. The committee room has a balcony all to itself, and the plan with a little more thought could be much improved. The secretary's office is an exception because, do what you may, it can only be reached by going through the committee room. The half-timber upper story of the building ought to oversail for good effect, if only a couple of inches. "Arc" makes the upper and lower walls quite flush so that all shadow, so valuable in old domestic work, is entirely lost.

"Astragal" heads the list of the second-class contributions, and in taking this lead, his plan has weighed much in the author's favour. The bar-parlour approaches what it should be, but a more direct connection wich the administrative department ought to have been secured. As it is, the kitchen opens out of the rear hall, and the barmaid must pass the men's dressing-room continually in a most inconvenient way. All the luncheon-room provisions have to be brought out into the hall before they can be sent up by way of the lift or staircase. The balconies are not nearly wide enough. The exterior with three gables marking the front is somewhat pleasing and simple. "Butts" comes next with a plan of no little merit. The bar opens out of the entrance porch, and the club-room can be reached without necessarily going through the bar-parlour. The plan looks like a building designed under the direction of the club committee, but the elevations are not to our taste. The building looks too smug, and externally it wants breadth and repose. "Butts" is careful and neat, so should improve. The printing on his drawing is coarse and poor. "Vigornia" is sumptuous in his ideas, and refined to delicacy. Here, again, the plan is stronger than the elevations. His hall cannot be said to justify its position, but the bar is kept well in touch with the kitchen. Two inner courtyards extend the area of this plan. "Cantab" does not succeed so well, but he deserves to be encouraged with the advice that he may do well to observe simplicity. To "Oak" the same advice may be given. Fuss and mere fancy do not belong to good architecture, and the less ornament you employ the better. Good broad lines and sweet proportion constitute the text ever to be preached upon. "Oak" is not a trifler, even if he has a waggish notion for odd figures in his perspectives, and his drawings show care. He cramps his main entrance very badly, and the lift to the servery from the kitchen would have to work by way of the entrance-hall passing and repassing in front of the men's convenience place. The octagonal turret looks as if it belonged to a schoolhouse. "Bacchus" makes a building which is unquestionably distinguished as a pavilion. The clubroom is quite cut off from the entrance-hall, and the bar is a timber inclosure worked into the hall away from all light and ventilation. Much care has been taken in inking-in the view with cross-hatching. "Desdichado" gives his balcony a very cockloft effect, and otherwise the elevations are bald and poor. "Sphilark" is a foolish motto, so badly printed that it is hardly legible. The circular tower looks like an adjunct to a waterworks or pumping station. In reality it contains a circular staircase leading to the golfers' luncheon-room. The design generally is bumptious, lumpy, and vulgar, with a very bad plan. "The Lucky Star" is the author of an unfortunate design, rich in cranks and crannies. It is, however, very neatly done, but it is a nightmare. "First Attempt" and "Levenach" conclude the series this time.

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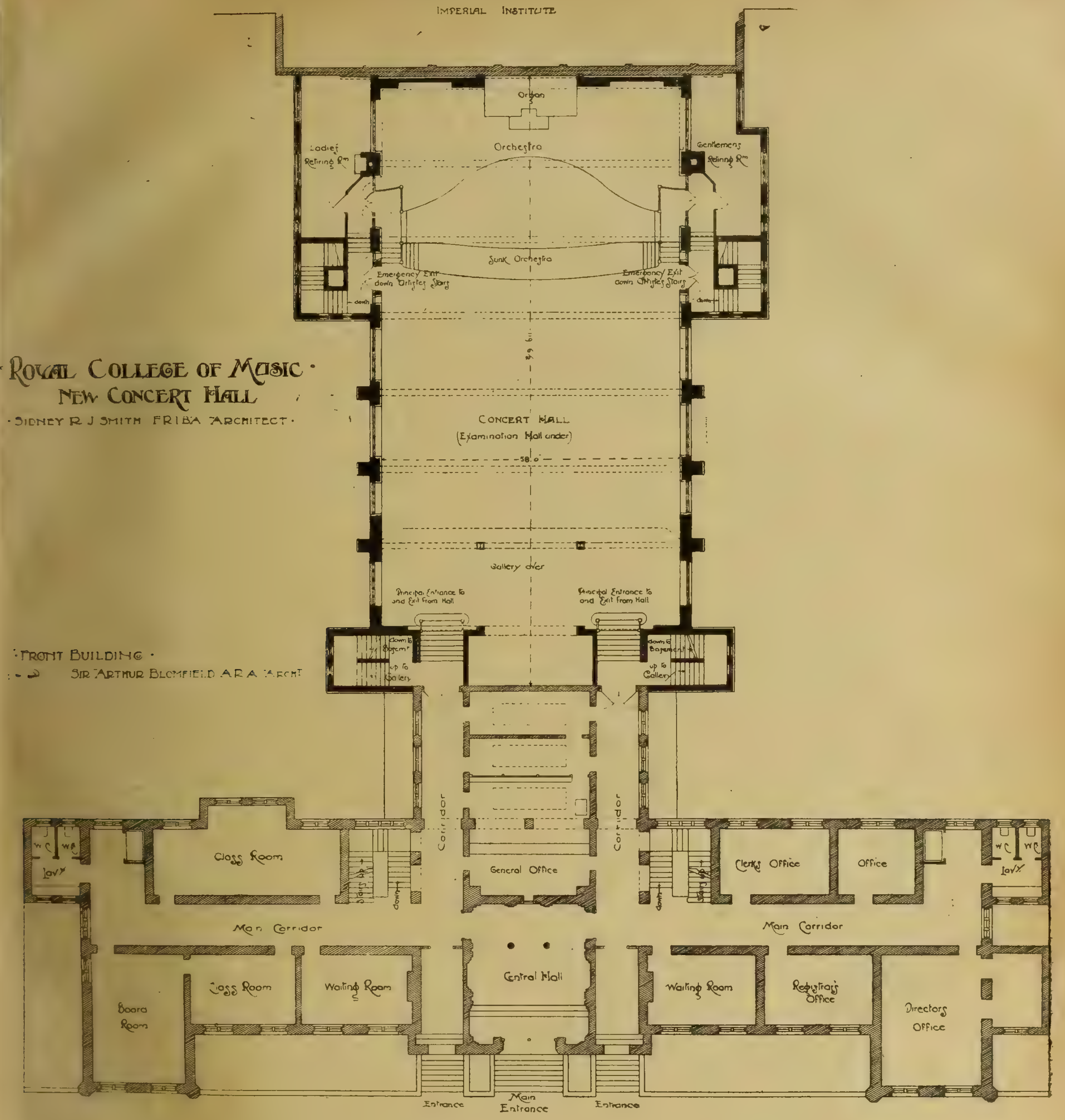
The Science and Art Department's announcement of the prizes awarded in the recent national competition shows that the Leeds School of Art students have gained one gold medal, four silver medals, and six bronze medals.



GROUND FLOOR PLAN

ROYAL COLLEGE OF MUSIC, SOUTH KENSINGTON.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATION.]

OUR illustrations show the new building which is in course of erection, from Mr. Sidney R. J. Smith's designs, the preliminary contract for the foundations now being carried out by Messrs. Higgs and Hill. Mr. Smith's design was placed first in a limited competition in which Mr. Belcher was the assessor. The new concert hall is at rear of the existing college, entrances having to be formed from the corridors to form ways with the hall, which is on a rather lower level than the old building on account of the great fall in the ground at rear; in the basement are examination-rooms, offices, &c. The new building is to be faced with red brick, and the interior facings are teak-wood dadoes, and decorative plaster above, and all of fire-resisting construction. The hall will seat (including gallery) about 1,200 people, and the orchestra is to be specially arranged for rehearsals by the students, and a large organ is to be provided at the rear of the orchestra. Sir Arthur Blomfield, A.R.A., was the architect for the front block of buildings belonging to the college.

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LONDON BOARD SCHOOL BUILDINGS.

THE annual report of the Works Committee of the School Board for London gives an abstract of the work done during the year ended March 25, and shows the progress made in the provision of accommodation. The committee state that compulsory powers were obtained in the Session of 1897-98 over ten sites for new schools and additional land for 13 existing schools. The number of sites for new schools scheduled in the present Session is 24, and the number of sites for enlarging schools or playgrounds or for general improvements is 50. In some cases, however, sites have since been omitted from the schedule. During the past year the Board have agreed to purchase various interests in sites at a cost of £199,741, the surveyors' fees in connection therewith amounting to £1,382. An idea of the extensive operations of the Board since it was formed may be gathered from the fact that the total cost of the sites purchased up to the end of the year under review is £3,488,038, and the costs £459,654. According to a table prepared by the Finance Department, the average cost of the sites for 419 schools, the accounts for which had been completed at September 29, 1898, was £6 19s. per child, and the average cost per head of school buildings was £13 15s 8d., and of the furniture and fittings 10s. 9d. Up to Lady-day, 1898, the total number of permanent schools which had been erected and opened was 430; and during the year under review nine additional schools and thirteen enlargements were opened. As an indication of the districts where the limit of school provision has not yet been reached, it may be stated that the nine new schools, accommodating 8,942 children, were erected—two in Finsbury, one in Greenwich, one in Hackey, one in East Lambeth, two in West Lambeth, one in Marylebone, and one in Westminster; while the enlargements of, or additions to, existing schools, accommodating an additional

4,065 children, were made in Finsbury, Greenwich, Hackney, Southwark, and Tower Hamlets. The cost of the new schools was £240,239, or £26 17s. 3d. per head, and of the enlargements £95,767, or £23 11s. 2d. per head.

With reference to the provision of accommodation in the future, tenders were accepted during the year for erecting ten new schools, giving accommodation for 9,305, at a cost of £208,484, or £22 8s. 1d. per head. These schools will be situated one each in Chelsea, Finsbury, Hackney, Marylebone, and Tower Hamlets, two in Greenwich, and three in East Lambeth. Tenders have also been accepted for erecting eleven enlargements, providing a total accommodation for 2,997 children, at a cost of £87,575, or £29 4s. 5d. per head. These enlargements will be carried out, one each in the City, Chelsea, Hackney, and Marylebone, two in Finsbury, two in Greenwich, and three in Southwark. With regard to the new schools, it should be stated that the tenders include the provision of halls, which are not counted in the accommodation of the schools, the provision of centres for cookery, laundry, manual training, or schools for special instruction, and also in all cases a drawing class-room. In three cases a playground is being provided on the roof; and three of the schools are being erected under special arrangements, with a view to reducing the cost. As to the enlargements, the variations in cost arise mainly from the fact that in enlarging the buildings the opportunity is taken to improve the existing schools by providing halls, &c., so as to make them thoroughly efficient; and in some cases the tenders include centres for cookery, laundry, manual training, drawing class-room, a chemical laboratory, a new house for the schoolkeeper, and a new drainage system. Tenders have also been accepted for providing four cookery centres, two laundry centres, complete domestic economy centres at three schools, 15 manual training centres, nine schools of special instruction, rooms for teaching upper standards at six higher grade schools, two centres for deaf children, housewifery centres at three schools, the enlarging of a blind centre, plant and installation for the electric lighting of the *Shaftesbury* training-ship, drainage and sanitary works at 30 schools; the amount of the tenders at 21 of the schools being £33,969; hot-water apparatus at many schools, and structural alterations at various others. The system of carrying out repairs to school buildings by workmen employed direct by the Board is being continued in nine out of eighteen districts, and also at the head offices, the staff employed numbering 83; and the whole of the repairs to furniture are being carried out by workmen employed direct by the Board, numbering 40. The rate of wages paid by the Board in the various trades is the same as is required by the Board to be paid by contractors to the workmen employed by them; and a wages clause is inserted in all contracts.

At Lady-day last the following amount of school accommodation was in course of provision:—Sixteen schools were being erected providing accommodation for 14,216 children, and 12 enlargements giving an additional accommodation for 3,396 children. Thirty-five additional sites for new schools had been or were being purchased, the schools to be erected on 28 of which would provide accommodation for 21,759. Six sites for new schools had been scheduled, but the accommodation of the schools to be erected on them had not been determined. Twenty enlargements of schools had been sanctioned, providing extra places for 5,962 children, and the Education Department has also sanctioned the provision of sites, which would be scheduled next session, in four districts. Two of these sites would provide 2,094 places, and the accommodation of the other two had yet to be determined.

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THE NEW WAR OFFICE: INIGO JONES REDIVIVUS.

THE Government have received the following memorial signed at the request of Lord Wemyss by a number of peers and an heir to a peerage, urging that the accepted plan by Mr. William Young for the new War Office buildings should be discarded, and an attempt made to carry out an adaptation of Inigo Jones's design for the palace which Charles II. proposed to build at Whitehall. The memorial was as follows:—

"We, the undersigned, believing that the building of a new War Office, on the historic site of the intended Whitehall Palace, offers a unique and last opportunity of realising, at least in part, Inigo Jones's grand design for the said palace—of which the banqueting-hall alone was built—venture to approach her Majesty's Government in relation to this most important matter. We pray them to have models made and publicly exhibited of the proposed War Office, and of a suggested adaptation of Inigo Jones's design—now on view in the Victoria Gallery—which, it is believed, might without difficulty be made to meet all War Office requirements while it would present a more imposing symmetric and extended front—immediately facing the Horse Guards—than the design that has been officially adopted. In respectfully making this request we are only asking in the public interest, and for the sake of those who come after us, that all possible care and precautions should be taken to insure the erection of a War Office building in all ways worthy of the site; and that by the public exhibition of models, as proposed, successful precedents, established in the case of designs for public buildings by Her Majesty's Office of Works, should now be followed."

The signatories are:—The Duke of Abercorn, Lords Aberdare, Abinger, Addington, Ailsa, Albemarle, Aldenham, Amherst, Annaly, Ardilaun, Arran, Ashburton, Bagot, Bangor, Bateman, Bathurst, Battersea, Berkeley, Bessborough, Brampton, and Brougham and Vaux, the Duke of Buccleuch, Lord Burton, the Bishop of Carlisle, Lords Castletown, Chelmsford, Chesterfield, Clanwilliam, Cork and Orrery, Crofton, Dartrey, De la Warr, Denbigh, De Vesci, Devon, Downe, Dunmore, Effingham, Egerton of Tatton, and Eldon, the Bishop of Ely, Lords Erroll, Falkland, Farnham, Ferrers, Fortescue, Galloway, Galway, Gosford, Granard, Greville, Grey, Haddington, Hardwicke, Hatherton, Hawkesbury, Headley, Herries, Home, Jersey, Keane, Kensington, Kenyon, Kimberley, Kinnoull, Lawrence, Leigh, Llangattock, Loch, Lothian, Macnaghten, Malmesbury, Mayo, Meath, Midleton, Monteagle, Muncaster, and Nelson, the Duke of Newcastle, the Duke of Norfolk, Lords Northampton, Norton, Orford, Ormonde, Poltimore, and Ribblesdale, the Bishop of Ripon, Lords Ripon, Roberts, Romney, Rookwood, Rothschild, Rowton, Sackville, St. Oswald, Saltoun, Sandwich, Saye and Sele, Scarbrough, Shand, Sherborne, Sinclair, Stair, Stalbridge, Stamford, Stanley of Alderley, Stanmore, Stratheden and Campbell, Suffield, Swansea, Temple, Templemore, Templetown, Tweeddale, Tweedmouth, Verulam, Warwick, and Waterford, the Duke of Wellington, Lord Wemyss, Lord Wenlock, the Duke of Westminster, Lords Wharncliffe, Wilton, Wimborne, Winchilsea and Nottingham, Wolseley, and Wolverton, the Bishop of Worcester, Lord Wrottesley, the Archbishop of York, and the Marquis of Lorne, M.P.

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BUILDERS' BENEVOLENT INSTITUTION.

THE fifty-second annual meeting of the Builders' Benevolent Institution took place at the offices, 35, Southampton-row, Bloomsbury-square, W.C., on Thursday, the 20th inst. Mr. J. T. Bolding presided, and amongst those present were—Mr. G. N. Watts, Mr. C. Ansell, Mr. E. V. New, Mr. T. Stirling, &c.

The secretary (Major Brutton) read the report, which stated that the charity continued to fulfil the purposes intended by the supporters. It was with much satisfaction that the committee were enabled to elect all the candidates eligible last November, thereby sparing them the anxiety, trouble, and expense of a contested election. The subscriptions were much the same as heretofore; but, considering the magnitude of the building trade and the numbers engaged in it, the committee regretted that there were so many who had not as yet given any help. They therefore ventured to hope that the present subscribers would do their utmost to make the institution known amongst their friends who did not subscribe, as it was absolutely necessary to obtain new subscribers each year to take the place of those removed by death and other causes, and they would observe that annual subscriptions must always be its sheet anchor. The prosperity of the past year was greatly influenced by the liberality and energy of the president, Mr. B. I. Greenwood, and to him therefore the institution owed a debt of gratitude. The institution had suffered a severe loss in the death of their esteemed treasurer, Mr. George Plucknett, who had filled that office for over forty years, and was one of its warmest and best friends. His place had been taken by Mr. J. Howard Colls. Mr. W. Scrivener, an old member of the committee, and a generous supporter of the charity, had also been taken. During the past year six pensioners had died, and three had been elected. The report added that the annual dinner will be held at the Carpenters' Hall on Thursday, the 23rd November next, when Mr. Alfred E. Parker (of the firm of Messrs. Patman and Fotheringham), the new president, will occupy the chair.

The Chairman, in moving the adoption of the report, said he thought the institution was very fortunate in getting Mr. Parker to accept the presidency for the current year. He was one of the youngest men in the building trade, and the introduction of young blood was certainly a step in the right direction. The report was unanimously adopted.

Votes of thanks were passed to the retiring president (Mr. Greenwood), the vice-presidents, trustees, treasurer, honorary auditors, and committee, and the proceedings closed with a vote of thanks to the chairman.

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CRUDE OIL FOR ROAD-MAKING.

SPRINKLING driveways with crude oil to lay dust has been tried by the Department of Parks of the City of Boston. Mr. J. A. Pettigrew, superintendent of the department, reports that about two months ago he sprinkled a section of one of the parkways, about 800ft. long and 40ft. wide, using the oil at the rate of 0·6 gallon per lineal foot. The roadway was hard and smooth, and the effect of the oil seemed to be a slight disintegration of the surface, or loosening of the bond of the macadam. The small particles of stone thus loosened were soon crushed into powder, and formed a layer on the surface which is now at least ¼in. thick, sufficiently permeated with the oil to prevent it from being blown by any but strong winds. The treatment has certainly resulted in the abatement of dust during a period of two months on that part of the roadway subjected to it. The cost, at the rate paid for the oil by the city, was a penny per lineal foot, or about £21 2s. 6d. sterling per mile of roadway. It is probable that by car-load lots the cost for oil could be reduced to £13 per mile. The rate for watering per mile during the same period would be £40; but this comparison would not be fair, as the efficiency of the first application of oil lasted longer than the two months of the experiment, when Mr. Pettigrew sent the information for this note. It is also necessary to take into consideration the fact that the dust was laid at all times, night and day, while under the road sprinkler there are many times when dust blows even with the best management. One disadvantage of the use of oil for park work is its rank odour, for even after the lapse of two months this was still so strong as to be the cause of much complaint; another is the damage to shrubbery growing close to the roadway, which seems to have been injured in some manner by the use of oil. The experiment was not considered so fruitful of good results as to induce the department to continue it. There is no question, however, that oil effectually lays the dust; and Mr. Pettigrew suggests that on a hard, clean macadam road it would be a good plan to spread a cushion of loamy sand to receive the oil, in order to prevent the disintegration of the surface of the macadam.

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At Burton-on-Trent the new infirmary has just been completed. Messrs. Lowe and Sons were the contractors, and all has been carried out under the supervision of Mr. Aston Webb, A.R.A., of London, the architect of the new building.

An inquiry was held at the Guildhall, Peterborough, yesterday (Thursday). Col. Slacke, R.E. heard the proposals of the town council of Peterborough, who had applied to the Local Governmen Board for approval of the borrowing of £11,000 fo the purchase of property fronting the Broadway, a a site for municipal buildings.

On Saturday the Bishop of Wakefield consecrate and opened the new chancel of St. Bartholomew' new church at Marsden, described as one of th finest of the modern erections in the rural deaner of Huddersfield. The church has been erected at cost of about £14,000, and the chancel alone cos £4,000. The church has been built from design by Mr. C. Hodgson Fowler, F.S.A., of Durham acting in conjunction with Mr. J. A. S. Kirk architect, of Huddersfield.

THE ANNUAL ADDRESS OF THE CHAIRMAN OF THE LONDON COUNTY COUNCIL.

LORD WELBY, the Chairman of the London County Council, delivered, on Tuesday, his annual address. He said that even in London nine out of ten of its citizens supposed that the chief business of their Council was transacted at their weekly meetings on Tuesday afternoons. It was not there and before the public that the chief part of their work was done, but in the comparative privacy of their unreported committees. The Council in full session judged, adopted, or rejected the recommendations of its committees, and the reports of the committees constituted the main record of the Council's work during the year.

BUILDING ACT COMMITTEE.

The Building Act Committee was intrusted by the Council with the task of administering a complicated law vital to the welfare of a human hive like London, but only made possible at all by moderation, and, above all, unity of interpretation in those who enforced it. The committee took care to ascertain the local opinion with reference to important matters, and it was satisfactory to learn that there were few instances in which serious protest had been made by the local authorities or the parties against the Council's decision. The number of cases dealt with under the fire protection sections of the Factory and Workshop Acts proved that their duties had been evaded neither by the committee nor its officials. In consequence of the collapse of Abbey Mansions, the committee had been considering whether, in any amendment of the Building Act, in buildings exceeding a certain size, the floors and internal structure over which the district surveyor had now no authority should not be subjected to his power as well as the roof, walls, and foundations.

THE IMPROVEMENTS COMMITTEE.

The chief achievement of the Improvements Committee had been the scheme for a new street from Holborn to the Strand, which had now practically received the assent of Parliament. The gross cost of the improvement was large; but the net charge, after providing for the rehousing of persons displaced, was reduced to £774,000, and the committee saw hope for a more favourable result.

THE HOUSING OF THE WORKING CLASSES.

One of the most important duties intrusted to the Council was the carrying into execution the provisions of Acts which provided for the housing of the working classes. The work was progressing, but they must hope for faster progress. He did not underrate the difficulties in acquiring suitable sites, the increase in cost of building, the restrictions which Government departments imposed upon them, and the onerous terms under which the Treasury required repayment of the debt. He could not but hope that a part of their work at least might be accomplished by the building of cottage dwellings in places easily accessible by tram or rail.

THEATRES AND MUSIC-HALLS.

The powers of this committee remained inadequate to their duties until the Council was authorised to grant temporary as well as annual licenses for music and dancing, so that premises used for such purposes might be brought under its control. By arrangement with the chief officer the Fire Brigade would in future inspect places of public entertainment. The committee in their task of preventing fire would thus have the benefit of the most skilled advice, while the firemen would become acquainted with the interior of the buildings. The lesson of the Paris catastrophe had not been lost, for in March last a fire occurred at the Hammersmith Theatre of Varieties, in connection with a cinematograph exhibition, which, but for the Council's regulations, might have been most serious. The Lord Chamberlain, upon granting licenses for theatres in his jurisdiction, consulted the Council as to the structural fitness of the buildings.

THE FIRE BRIGADE.

The work of mobilisation of the Fire Brigade on the principles laid down by the chief officer had steadily proceeded. Special attention had been paid to improving the river service, and quarters had been provided for the men at Battersea. Risk to life had been further diminished by an increase in the number of horsed escapes designed by Commander Wells, who had assigned his patents to the Council. For the five years 1889-1894 the percentage of serious fires to the total number was 6·2. During the last five years it had fallen to 4·2.

MAIN DRAINAGE.

London was deeply interested in the question whether its sewage could be satisfactorily disposed of by filtration through coke beds and intermittent bacterial treatment. The experiments which the Main Drainage Committee had in hand were continued during the past year. The results so far obtained showed that the filters could remove the whole of the suspended matter from the crude sewage, as well as over 50 per cent. of the putrescible matter.

PARKS.

Since 1889-1890 the number of open spaces under the Council's care had increased 100 per cent., and the total acreage 40 per cent., from 2,656 to 3,753 acres. Nearly 70 acres of open space had been added during the year. The acquisition of Golder's-hill, on the north side of Hampstead Heath, increased greatly the amenities of the heath.

ASYLUMS.

The report of the Asylums Committee was a document whose gravity they would do well to consider. Excluding the City, the population of London had increased at the rate of 9·3 per cent. in the last decade. The number of registered lunatics, however, had grown at the rate of 31·2 per cent. Improved registration would account for part of this increase; but these figures demanded most earnest attention. An interesting experiment was being made on the recommendation of the committee in the establishment of a working colony for about 300 male epileptic patients in villas at Horton.

TECHNICAL EDUCATION.

The Technical Education Board had satisfactory progress to record. The board had secured a promise from the commission appointed to draft a constitution for the new University that they would include a faculty of engineering and a faculty of commercial education. They had been much engaged in an inquiry, all important to themselves in other branches, as to the facilities in London for education in the building trades, and were proposing schools to take the place left vacant by the decay of the apprentice system. The board considered that their best results had been achieved in the teaching of the arts and crafts in Regent-street, at Camberwell, and at Bolt-court. It was interesting to note the progress of the board's work as measured by its expenditure, beginning in 1893-94 with the modest sum of £4,528, rising in 1898-99 to £129,009, while the estimated expenditure of the current year was £196,650. This amount, however, included outlay which it was stated would not necessarily recur.

THE COUNCIL'S PROPERTY.

The Corporate Property Committee reported that at the close of last December the Council's lands and ground-rents were valued at £2,542,818. The ground plan, which had proved itself to be of undoubted utility, now covered three-fourths of the area of the county of London.

WATER COMMITTEE.

The report of the Water Committee recapitulated the reasons that induced the Council to persevere this session with its Bills for acquiring the undertakings of the companies and for supplementing them from Wales. In the summer of last year the flow of the Thames fell far below the minimum of 300,000,000gal. estimated by the Balfour Commission. The House of Commons, however, rejected the Bill on the ground that it was inexpedient that the Bill should be read a second time before the Royal Commission on London Water Supply had made its report. The close of the session had come, and the Commission had not as yet issued its report. Meantime the volume of water in the Thames had been falling as compared with previous years. It must not be forgotten that it would require nine or ten years to obtain a supply from Wales, and time was passing.

HIGHWAYS.

The Highways Committee had earned their first experience in the working of municipal tramways. The undertaking of the London Tramways Company was purchased at a cost of £860,872. They resolved forthwith to revise the conditions of employment by raising wages to a scale equal to the best paid in London for similar work, while requiring one day's rest in seven. They were advised that this would cost them £13,300. The committee, however, felt justified in anticipating that at the close of the financial year £39,100 would be available for relief of the rates or for other purpose after payment of interest and sinking fund. The committee was making experiments in electrical traction. Professor Kennedy was investigating the subject under their instructions. They trusted that ere long it might be practicable to adopt the system with great benefit to the Metropolis.

Lord Welby closed with a brief and colourless reference to the London Government Bill.

CHIPS.

Fleet Church, Hants, has been fitted with the latest improved hot-water heating apparatus by Messrs. John King, engineers, Liverpool, employing their well-known "small-tube" apparatus, with special economical coil-heater with water-way firebars.

At a meeting of the Bristol Town Council on Tuesday, it was announced that Sir William Henry Wills had offered a gift of £10.000 towards the erection of a Municipal Art Gallery building, on a site to be secured by the Corporation near the Bristol Museum, Queen's-road, Clifton.

In the Consistory Court of London, on Tuesday, the Chancellor decided, after hearing evidence in opposition, to grant the faculty asked for by the rector and churchwardens of St. Dunstan-in-the-West, authorising certain alterations in the church in view of an agreement for the sale by the rector and churchwardens of the western portion of the forecourt of the church. The decision was given subject to the condition that the trustees had the power to sell the land. Notice of appeal was given on behalf of certain parishioners who oppose the scheme.

The committee of the William Black Memorial Fund have decided that the memorial shall take the form of a beacon light to be known as the William Black Beacon. The Commissioners of Northern Lighthouses state that there is absolute necessity for such a light at Duart Point, near the entrance to the Sound of Mull, where most of the steamer traffic of the West Highlands passes.

The Edinburgh and Leith Gas Commissioners have raised the salary of their engineer, Mr. Herring, to £1,200 a year.

The whole of the town council of Newport, Mon., in committee, met at the town-hall on Monday for the purpose of paying a visit to the Wentwood Waterworks. The expenditure on the works up to the present has been £160,000, and they are not completed. The original estimate was £120,000, and the contract was let for £93,000; but the corporation subsequently got rid of the contractor, and are doing the work themselves.

The Duchess of York opened the new wing of the Royal Cambridge Asylum, Norbiton, on the 13th inst. The building, which has cost £30 000, was executed by Messrs. W. Holt and Sons, of Croydon. Mr. Walter T. Holt had the honour of being presented to their Royal Highnesses in the presence of a distinguished company.

The expenditure on the London Board Schools opened during the year 1897-98 has been—Average cost per head:—Cost of site, &c, £7 4s. 6d.; cost of building, &c., £19 5s. 6d.; cost of furniture, &c., 14s. 5d. Total, £27 4s. 5d.

At a meeting of the town council of Auchterarder, N.B., on Monday, Mr. R. M. Christie, C.E., Dunblane, was appointed engineer of the proposed new water scheme for the burgh about to be proceeded with.

The death is announced from Basle, at the age of 82 years, of M. Nicholas Riggenbach, who promoted and engineered several funicular and rack-and-pinion railways. He directed the construction of the Righi Railway.

Mr. W. B. Dalton, formerly headmaster of Huddersfield School of Art, has been appointed headmaster of the Camberwell School of Arts and Crafts. This school is conducted by the Technical Education Board in the building erected at the cost of Mr. J. Passmore Edwards, and from plans by Mr. Maurice B. Adams, F.R.I B A., in the Peckham-road as a memorial to the late Lord Leighton. The former headmaster, Mr. C. L. Burns, has obtained an appointment under the Government in India.

The new workhouse infirmary, Liskeard, Cornwall, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues, patent exhaust roof ventilators, and inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

OBITUARY.

Sir Henry Edward Leigh Dryden, Bart., died at his picturesque residence, Canons-Ashby Hall, Northamptonshire, on Monday, after two months' illness, due to blood poisoning, following an accident. Born in 1818, in 1837 he succeeded his father, Sir Henry Dryden, in the baronetcy of 1795, and in 1874 his cousin, Sir Henry Edward Page-Turner, in the baronetcy of 1733. Sir Henry was a well-known antiquary, and wrote a large number of papers and articles, illustrated by well-executed drawings by his own hand, for the Scottish Society of Antiquaries, the Scottish Architectural Society, and the Northampton and local archæological societies and their publications. Last year he presented to the Corporation of Northampton the large collection of drawings, plans, and rubbings that he had collected in Northamptonshire during the last 60 years, contained in more than 500 portfolios. Lady Dryden died in January of this year. Sir Henry leaves an only daughter. John Dryden, the poet, was the fourth son of Sir Erasmus Dryden, the first baronet of the more ancient line. The reception afforded by the late baronet to the Architectural Association on the occasion of the Banbury Excursion, when Canons Ashby was visited, will ever be remembered by those who were present with the utmost pleasure. Not only was Sir Henry Dryden a genial host, but an enthusiastic lover of architecture, who valued architects as fellow students, and he took the greatest possible pleasure in imparting his knowledge to others. He was a model type of an English gentleman, rich in learning and possessed of a keen sense of humour.

Mr. Thomas Bonnar, senior partner of Thomas Bonnar and Son, decorators and art designers, 58, George-street, Edinburgh, died on Friday last, aged 58 years. Mr. Bonnar belonged to a family which for generations has been connected with Edinburgh and decorative art. Mr. William Bonnar, R.S.A., was an uncle of the deceased. and his father—the late Mr. Thomas Bonnar, of the firm of Bonnar and Carfrae—did much to raise the status and reputation of decorative painting in Scotland. Mr. Bonnar inherited the family taste and talent, and was associated with his father in some of his best work. The decorations of the Parliament Hall at the Castle, and of the St. Bernard's Mineral Well, are from the son's hands. He had a keen appreciation and large knowledge of art in other aspects, and mention may be made of the forms and colours of Mediæval mural paintings as one of the subjects on which he bestowed special duty. In addition to papers contributed to antiquarian, architectural, and art societies, Mr. Bonnar wrote a biography of George Meikle Kemp, the designer of the Scott Monument, who was his uncle by marriage. Latterly he took an active part in obtaining the charter of the Imperial Institute of British Decorators, and he acted as a director of the Edinburgh Royal Blind Asylum until ill-health induced him to resign.

Alderman George Johnson, of Morley, died at his residence in King-street on Friday evening after a painful illness. After serving his apprenticeship with a joiner and builder at Binbrook, Louth, Mr. Johnson went to Leeds, and in 1865 entered into partnership with Mr. Ledgard, and subsequently removed to Morley, where since 1870 he has been closely connected with the business and public life of the town. He was elected a member of the late Local Board in 1822, and on the incorporation of the borough he was elected a representative of the Central Ward. In 1895 he was elected Mayor, and in the following year was elevated to the aldermanic bench. Mr. Johnson leaves a widow and numerous family.

Alterations are being made at the Sessions Court, Peterborough, from the designs of Mr. A. W. Ruddle, architect, Peterborough, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

A petition signed by the rector and churchwardens was presented to the London Consistory Court on Tuesday praying for a faculty to authorise certain alterations and improvements in the ancient parish church of St. Dunstan, Stepney, in accordance with plans approved at a public meeting. The estimated cost was about £3,250, of which about £2,600 is already in hand or promised. When these works are carried out, the church, with its extra accommodation, will seat 740 persons. The application was unopposed, and the Chancellor granted the faculty as prayed.

Engineering Notes.

Hull.—The opening of the Alexandra Dock Extension took place on Tuesday. The extension is 7½ acres in extent, and has been designed specially for the shipment of coal and mining timbers. It will be fitted with four coal hoists. The length of additional quay provided is nearly half a mile, and the depth of water will be the same as in the existing Alexandra Dock. From foundation to coping the dock walls, which are of solid concrete, average 50ft. in height, and are 22ft. wide to base. In carrying out the works, nearly 400,000 yards have been excavated, and nearly 66,000 cubic yards of concrete work have been executed. The whole of the work has been done under the superintendence of Mr. R. Pawley, M.I.C.E., the company's engineer.

Hydraulic Power for Manchester.—Since the corporation of Manchester began to supply hydraulic power in 1894, the demand for this form of energy has steadily increased. Almost before the erection of the Gloucester-street pumping station was completed, it was decided to erect a second station. A fresh site was secured in Pott-street, Ancoats. The plans for the building were prepared by Mr. J. W. Beaumont, and the designs of the machinery and ironwork by Mr. L. Holme Lewis, the engineer and manager. When the work is completed the plant will have the same capacity as that at Gloucester-street station. At present, however, only two of the six sets of engines are erected, but the contract has been let for two more sets. The contracts already let and nearing completion amount to £35,921 7s. 4d. The energy which the ordinary water supply contains before it passes to the storage tank is used for driving the machinery which conveys the coal to and the ashes from the boiler furnaces, and also for driving the mechanical stokers. Provision is made for utilising all the water from condensed steam. The pipes in the engine and boiler houses are all arranged on the duplicate or circuit system, and access is given to all parts of the machinery, pipes, and fittings. The station is to be lighted by electricity, which will be generated by the hydraulic pressure on the premises. The dynamo is driven direct from the shaft of the hydraulic motor, and both are mounted on the same bedplate. The pressure in the mains will be maintained at not less than 1,000lb. to the square inch. When greater pressures are required they can be obtained by means of "intensifiers" fixed on the consumer's premises. The length of hydraulic mains laid in the city is nearly sixteen miles The pipes are of various sizes, ranging from 6in. to 3in. internal diameter. The corporation are supplying power, taking the difference of pressure into account, at a lower price than any other corporation or company in the country.

Manchester Ship Canal.—The steady increase in the number and size of the ships seeking berths in the Manchester docks has made necessary a number of improvements and extensions some of which are now being carried out at Cornbrook under the direction of Mr. W. H. Hunter, chief engineer to the Canal. A channel 50ft wide and 16ft. deep is being excavated on the Cornbrook side of the Irwell for a distance of 600 yards above the entrance at Pomona to No. 1 Dock, and upon this raised wharf three large transit sheds, each 71ft. in width, will be built, and other sheds will be extended in width over the railway lines to the edge of the wharves. The work of deepening the river is slow and costly, as the bed is red sandstone, the expense of removal under water being about £1 for every three yards. The effect of these improvements will be to create a new quay, nearly a third of a mile long, within ten minutes' walk of Deansgate. It will be equipped with a continuous line of transit sheds and connected by road and rail with all parts of the district. Another, though a smaller, improvement at Pomona is the bridging over of the corner of No. 2 Dock and the carrying of the railway across it. Hitherto trains passing this dock have had to be broken up and shunted into a short Y siding which could only take three waggons at a time. At the Salford docks the accommodation is to be increased by the building of another large three or four-story transit shed upon the sites now occupied by some single-story sheds which are to be removed to Cornbrook. Here also the buildings will be set close to the waterside.

Roker, Sunderland.—The members of the Institution of Naval Architects, who have been holding their annual conference at Newcastle-on-Tyne, visited Sunderland on Saturday and witnessed the laying by the Earl of Hopetoun of a memorial monolith of concrete weighing 43 tons in the northern pier at Roker. Mr. H. H. Wake, M.Inst.C.E., the engineer to the River Wear Commissioners, gave a brief description of the piers and the different port works. He remarked that the harbour works of Sunderland were unique in construction, inasmuch as they were built entirely outside the high-water mark, the whole of the foreshore having been reclaimed by means of groynes. Mr. Wake mentioned that the foundation stone of the Roker pier was laid in 1885 by Sir James Laing, the chairman of the River Wear Commission. The area of water inclosed in the docks was 50½ acres, while that between the piers represented 153 acres. There were three miles of quayage round their works; they had 500 acres of property, and the lock at the South Dock, which was 480ft. long by 90ft. broad, was, when it was opened, the largest in England. The length of the Roker Pier would be 2,790ft., and of that there was now only some 38ft. remaining to be finished until they reached the round head, which they would put down next year. This round head would be built upon a steel or iron caisson loaded with a mass of 13,000 tons of concrete. When fully completed, and the lighthouse upon it, the weight would be raised to 28,800 tons. Their hope was, indeed, that the whole of this work would be finished by the end of next year. The South Pier, which did not need to be as strongly constructed as its fellow at Roker, would be 2,884ft. in length, of which 1,763ft. had already been built. Before these piers were commenced with, the commissioners had to maintain the depth of water on the bar by dredging. Since then, however, they had, simply through the action of the piers, and without any dredging whatever, gained more than 12ft. of water on the bar. Not a single life had been lost or a man been even seriously injured during the whole time the work had been in operation.

CHIPS.

An application has been made by the corporation of Liverpool for the sanction of the Local Government Board to the borrowing of £1,400 for the purpose of laying out as public walks the St. Martin's Recreation Ground and the St. Martin's-in-the-Fields Churchyard; and Mr. G. W. Willcocks, one of the inspectors of the Board, will hold an inquiry into the matter at the municipal offices, Liverpool, to-day (Friday).

At the Estate Mart last week a strong revival of trade was manifest. The returns for the week of £201,008 were, however, £100,000 less than the corresponding week of last year.

A select committee of the House of Lords have passed the preamble of the Harrow and Uxbridge Railway Bill, under which the Harrow and Uxbridge Railway Company propose to make extensions at Pinner and Harrow, so as to connect their authorised line with that of the Metropolitan Company, and to take power to work both the authorised and new lines by steam or electricity.

Sir Francis Marindin and Major Cardew inspected the Dudley and Stourbridge Tramway on Tuesday, and the electric cars began running the following day. A line is in course of construction from Stour bridge to Kinver; another line will be carried through Stourbridge to the Bromsgrove end of that town, with possibilities of extension to Hagley and Clent, and another line is to be carried through Lye in the direction of Cradley. Leaving the existing line at Holly Hall, a line is being made to Kingswinford, which will thence be carried through Wordsley to join the main line at the bottom of Brettell-lane.

A scheme is in contemplation by which Ben Cleuch, the highest mountain in the Ochil range, is about to be made more accessible by an electric railway to its summit, where it is proposed to erect a sanitorium or hotel. Mr. Hewitt, of Manchester, the engineer to the promoters, has made the final arrangements for the necessary concession through Messrs. Hill and Whyte, S.S.C., Stirling, solicitor to the promoters, with Mr. Atherton Gray, facto to Miss Johnston of Alva, the proprietress of Be Cleuch.

Considerable alterations are in progress at 19, Liverpool-street, E.C., for Messrs. Mills and Co., Limited, from plans and under the superintendence of Mr. Spencer W. Grant, A.R.I.B.A., of 63 Finsbury-pavement. The work is most difficult owing to the business having to go on withou interruption, but is being most energetically an ably carried out by Mr. A. Porter, of Tottenham Messrs. Braby are supplying the slate and marbl work, and the mosaic floor, &c.

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ILLUSTRATIONS.

FIRE AND POLICE STATION, SHEFFIELD.—NEW CONCERT HALL AT THE ROYAL COLLEGE OF MUSIC.—HOUSE AT NEWARK.—NATIONAL SILVER MEDAL DRAWINGS FOR BOOK ILLUSTRATIONS.—NEW CLUBHOUSE AT SURBITON.—VICTORIA LIBRARY, NEWCASTLE-ON-TYNE.—DESIGNS FOR A GOLF CLUBHOUSE.

Our Illustrations.

NEW FIRE AND POLICE STATION, SHEFFIELD.

This building is now being erected for the city council on a corner site at the junction of West-bar and Westbar Green, one of the most commanding positions in Sheffield. The elevation, 55 yards long and three stories high, is designed in the 18th century Renaissance style, and is faced with Edwards' Ruabon red bricks, with dressings of Laws Hall (Carlisle) stone. The whole of the upper floor is arranged as bedrooms for twenty single men, with the necessary bathrooms, lavatories, &c. The first floor contains kitchen, mess-room, and ample accommodation for cleaning and storing clothes, boots, &c., and for recreation. The station has only one main entrance, through which access is gained to the police department on the left and the fire department on the right, each being complete within itself, except that the telephone-room and large stable will answer for both. Messrs. Ash, Son, and Biggin are the contractors for the building. The clerk of works is Mr. Walter Davison, and the architect Mr. Joseph Norton, of Alliance Chambers, George-street, Sheffield, the total cost being upwards of £7,000.

ROYAL COLLEGE OF MUSIC, SOUTH KENSINGTON.

(For description and general plan see p. 93.)

NEW RESIDENCE, LONDON ROAD, NEWARK.

The above house has been erected for Mr. Oliver Quibell, and contains dining-room, drawing-room, morning-room, with sitting entrance-hall, together with the usual kitchen offices and out-buildings; the exterior being constructed of red sand brick, and the upper portion being of cement rough-cast, the roof being covered with red tiles. The cornice is constructed of wood, and, with the rest of the exterior woodwork, is painted white. The work has been carried out by Mr. William Smith, builder, of Newark, from drawings by Messrs. Brewill and Baily, architects, of Nottingham and Newark.

NATIONAL SILVER MEDAL DESIGNS FOR BOOK ILLUSTRATIONS.

The landscapes comprised in the selection here given were all suggested by existing local views near Scarborough, modified only slightly to meet the exigencies of the style of black and white adopted. For instance, the series of five small landscape views are—the two upright ones glimpses of Raincliffe Wood, the lower centre one looks down Stepney Hill, and the other was suggested by a view near Seamer. The larger landscapes are near Cloughton and Hackness respectively; the former being typical of the strong, rugged aspect of East Yorkshire scenery, whilst the latter, containing a view of Hackness Church, is an attempt at depicting cloud-shadows on a summer's day. The time is chosen when the sweeping shadows rest on the dark foliage of the trees in the centre of the picture, transforming their cool green into a deep indigo, which helps out beautifully the idea of brilliant sunlight on the distant "wolds." The figure-subject is one of a series dealing with "The Babes in the Wood" as treated in a modern version by Mr. F. Bedwell, a friend of the artist. It illustrates the children on their way to school, which is conducted in this case by an odious parson, who takes the place of the wicked uncle. This illustration was drawn for considerable reduction—to about 5in. across. Mr. Sunderland Rollinson writes:—"It would be useless for me to try and explain the technique of the work, as this explains, in a great measure, itself. I may mention, however, that the line used is always the one which explains the most clearly the surface to be depicted." These designs obtained a National Silver Medal at South Kensington last summer.

THE SURBITON CLUB.

This building has recently been completed from plans prepared by and under the superintendence of Messrs. Carter and Ashworth, AA.R.I.B.A., of 55, Clarence-street, Kingston-on-Thames, whose design was selected by the committee of the club in a limited competition. The plans given herewith sufficiently indicate the general arrangement. Lawrence's "T. L. B." bricks have been used for the facings, and Monk's Park stone for the windows and dressings, and the roofs are covered with Broseley tiles. All the stone windows have been fitted with iron casements. All the principal rooms are ventilated by Tobin inlets and extraction flues carried up in the chimney stacks. For the billiard-room two induced current ventilators with automatic valve-boxes have been employed in connection with Tobin tubes. The works have been efficiently carried out by Mr. F. Hawkey, of Brighton-road, Surbiton, at a total cost of £3,105.

VICTORIA LIBRARY, NEWCASTLE-ON-TYNE.

This is a branch library, erected in Heaton Park at the expense of Alderman W. H. Stephenson, J.P., who has been three times Mayor of Newcastle, as a memorial of the Queen's Diamond Jubilee. The plans explain the accommodation. The lower story is built of rubble stone, sneck-faced and chiselled dressings. The upper story is of brick, faced with special-made Penshaw bricks. The roofs are covered with brindled tiles. The interior woodwork is all of canary wood, with green oil stain. The heating is by radiators, with low-pressure steam, and has been carried out by Messrs. Ashwell and Nesbit, Ltd. Messrs. J. and W. Lowry were the general contractors, and carried out the work from the designs of Mr. John W. Dyson, M.S.A., architect, of Newcastle.

"BUILDING NEWS" DESIGNING CLUB: A GOLF CLUBHOUSE.

(For description and awards see p. 92.)

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The foundation-stone was laid last week of a parish-room now being built alongside Christ Church, Tunbridge Wells. The new building, which has been designed by Messrs. Cronk, and for which Messrs. Strange are the contractors, is to be of white brick, to harmonise with the church, and will cost £1,199. The parochial hall will be 55ft. by 25ft., with a classroom and kitchen at the rear.

Auchtergaven parish church was reopened recently, after extensive alterations and renovation. The church has been reseated throughout, and a vestry has been added. There have been presented to the church an octagonal oak pulpit, oak Communion table, both Early Perpendicular in style, a font of Sicilian marble, brass lectern, two stained-glass windows, and silver Communion service. Messrs. Lyle and Constable, Edinburgh, are the architects.

The committee of the Robert Browning Settlement have secured from the Ecclesiastical Commissioners a site of 107ft. by 23ft. for a men's clubhouse in the Walworth-road, at the corner of York-street, in which Browning Hall stands. Plans have been prepared by Messrs. Spalding and Cross for a four-story building, which will include a coffee tavern and a gymnasium on the ground floor, with reading-room, clubroom, chessroom, bagatelle-room, and kitchen above, while two billiard-rooms will be provided in the basement. The cost of the structure will be £3,500, and of the furniture £500.

COMPETITIONS.

Edinburgh: New County Buildings for Mid-Lothian.—Under a remit from the Mid-Lothian County Council, the committee in charge of the reconstruction of the county buildings recently appointed Mr. W. Wybrow Robertson, of H.M. Board of Works, architectural assessor on the competitive designs which have been received by the council. They also appointed Mr. William Ormiston, Dean of Guild of the City of Edinburgh, as surveyor to test the estimates submitted along with the plans. The competitive plans have been hung in a room in the National Portrait Gallery, Queen-street, where they are open to public inspection, except on Thursdays and Fridays.

Fulham.—Twenty-nine designs have been received for the public baths and washhouses at Fulham; but the professional assessor, who is to be nominated by the President of the R.I.B.A., had not been appointed when we heard a few days ago.

Newcastle-on-Tyne. — The Blackett-street Presbyterian Church, occupying a central position in the city, was recently sold, and is to be pulled down for the erection of business premises. A new site has been purchased by the building committee of the church in College-road, almost opposite the Durham College of Science, and the committee invited four local architects to send in competition plans for the new church and hall, the drawings to be sent in unsigned or under motto. Four sets of drawings were received, one set unsigned and the other three under the mottoes "Experientia Docet," "99," and "St. Andrew's." The committee unanimously decided on those sent in under the motto "St. Andrews," which proved to be the design of Messrs. Badenoch and Bruce, 55, Pilgrim-street, Newcastle-on-Tyne, and they have been appointed architects for the work.

Willesden.—The School Board for Willesden are about to build a mixed school in Salisbury-road, Kilburn, for 1,440 children, or 570 infants and 870 boys and girls. The actual subdivision of the scholars was left to the architects who took part in the competition which has just been determined. Mr. W. S. Braithwaite, the architect to the Leeds School Board, acted as professional referee. The award is Mr. E. H. Lingen Barker, of Chancery-lane, first; Mr. G. E. T. Lawrence, second; Mr. G. W. Webb, third; and the late Mr. Charles Bell's plan was given the fourth place. The chosen plan occupies two floors, 450 infants being located below, and 750 boys and girls above. If the board wishes, the assembly hall can, according to the rules of the Education Department, be used as extra classrooms for 60 pupils each, thus reaching the number stated above.

◆

CHIPS.

Mr. Thomas, the Woolwich Local Board's surveyor, has been granted an increase of salary from £400 to £500. The Plumstead and Woolwich surveyors now receive equal salaries.

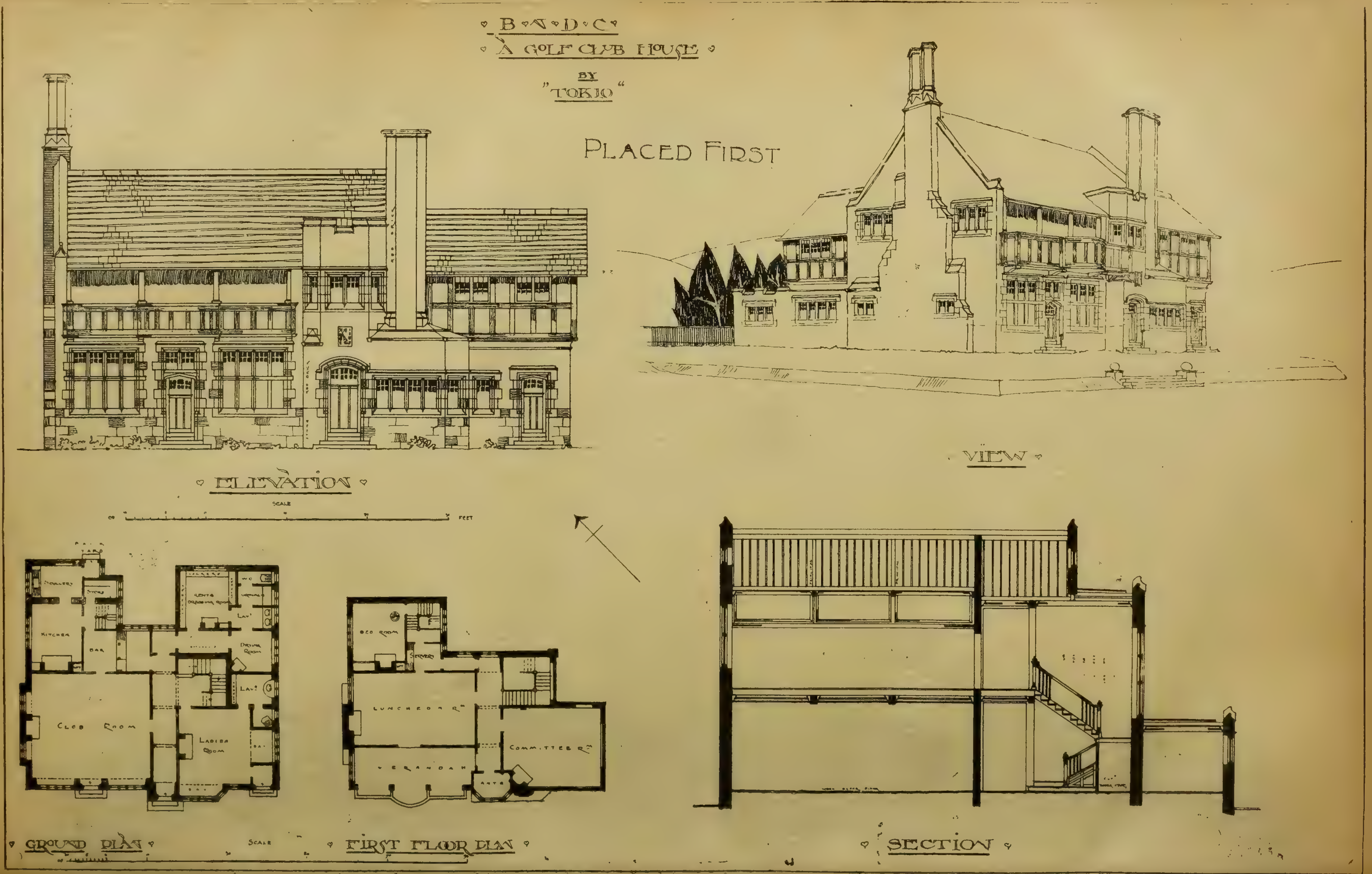
The urban district council of Cannock have under consideration a sewerage scheme for the district, prepared by their surveyor, Mr. W. Blackshaw, and estimated to cost £25,000. Mr. H. Law, C.E., will be consulted by the council as to the merits of the scheme.

Mr. C. R. Fenwick, of Leeds, has given his decision in the arbitration between Mr. Miles Rhodes and the Shipley District Council. Mr. Rhodes claimed £1,160 as damage to a tannery during the laying of a main drain. Mr. Fenwick has awarded Mr. Rhodes £546 10s.

While excavating the foundations of a house for Inspector Rowlands on the site of an old Dominican friary at Bangor, some workmen discovered two tombstones, elaborately carved, and both about 6ft. in length. The finer of the two is in one piece, and has carved upon it in high relief *fleur de lis* and a heart-shaped shield, which occupies the centre of the stone. The second tombstone is in three pieces, which, when placed together, display a cross running the whole length.

The Edinburgh and District Water Trustees have raised the salary of Mr. Black, their superintendent of works, from £300 to £400 per annum. Mr. Coyne, the late superintendent, had a salary of £500 for several years before he retired.

The monument to be erected in memory of Robert Schumann, at Zwickau, in Saxony, will be unveiled on July 8, 1901, the ninety-first anniversary of his birth. It will cost about £1,500 sterling, and will be the work of Herr Johannis Hartmann, of Leipzig.



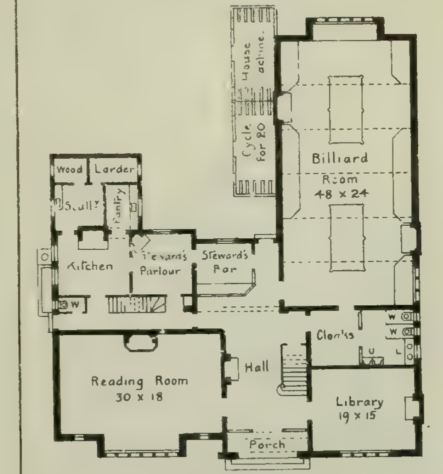
B·A·D·C·
A GOLF CLUB HOUSE
BY
"TOKIO"

PLACED FIRST

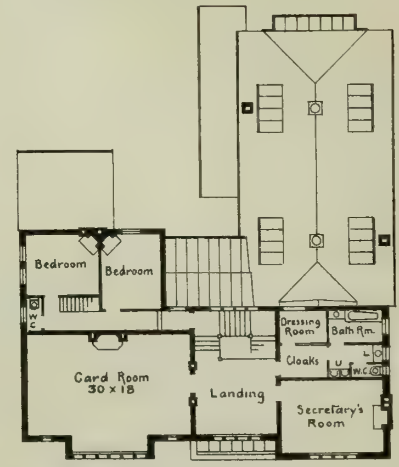
New · Club · House : St. James's Road, Surbiton :

—for · the · Surbiton · Club—

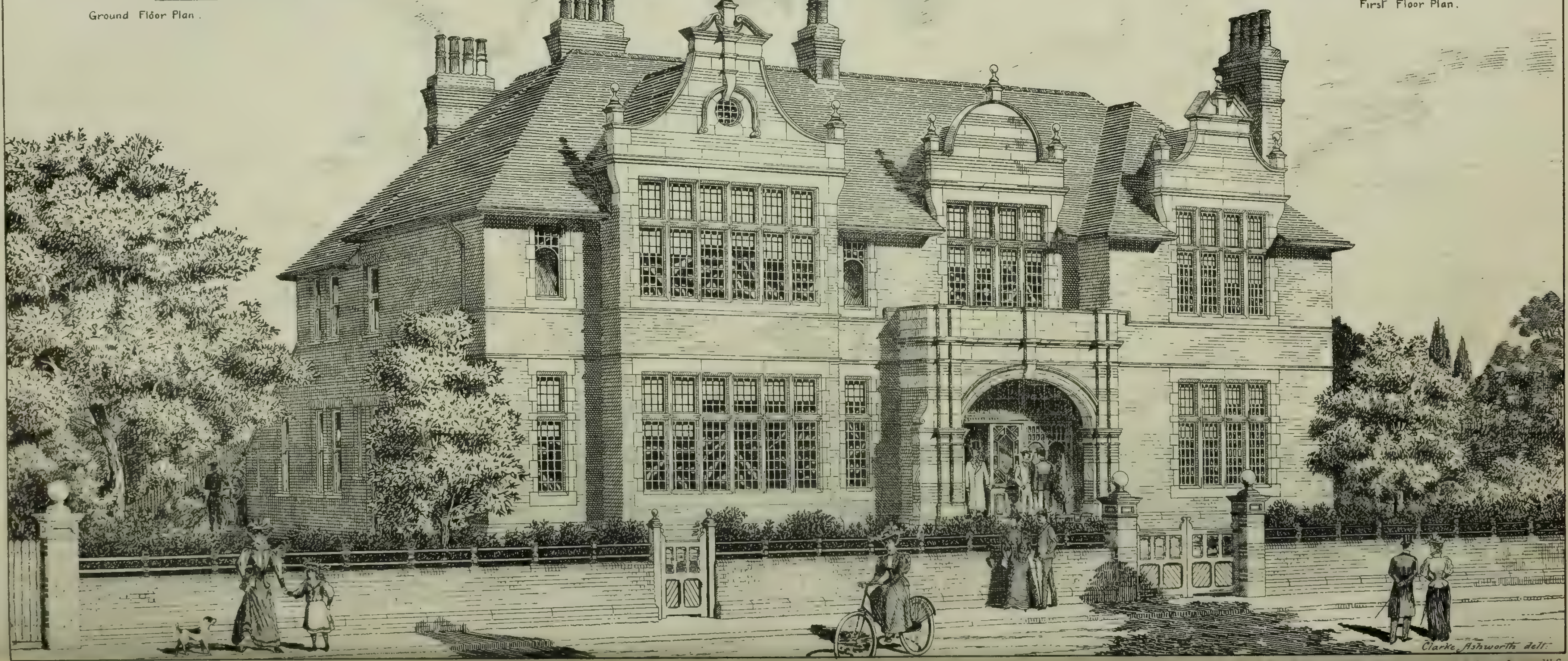
Edward Carter A.R.I.B.A. }
Clarke Ashworth A.R.I.B.A. } Architects.



Ground Floor Plan.



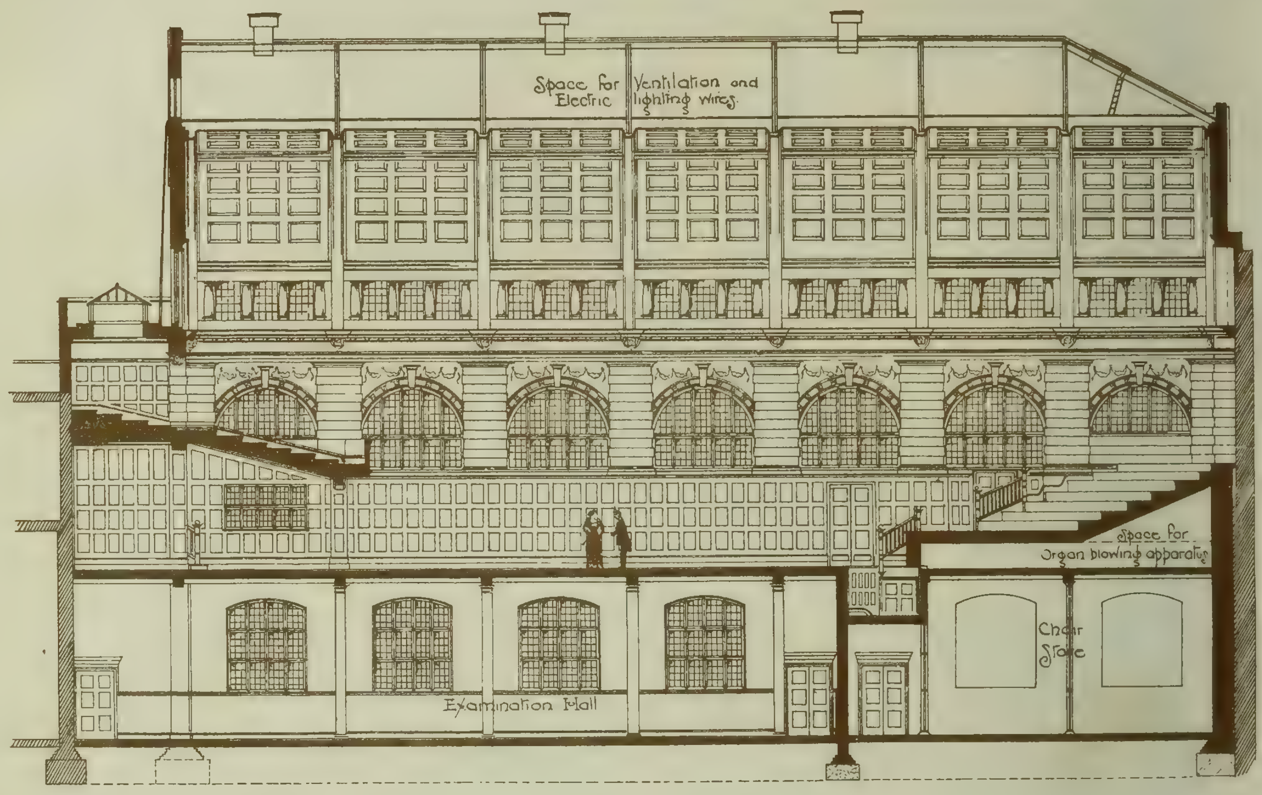
First Floor Plan.


Clarke Ashworth delt.

[illegible] James Akerman, 6 Queen Square W.C.

ROYAL COLLEGE OF MUSIC NEW CONCERT HALL

Sidney R. J. Smith F.R.I.B.A.
Architect


Space for Ventilation and Electric lighting wires
Space for Organ blowing apparatus
Choir Store
Examination Hall

Longitudinal Section.

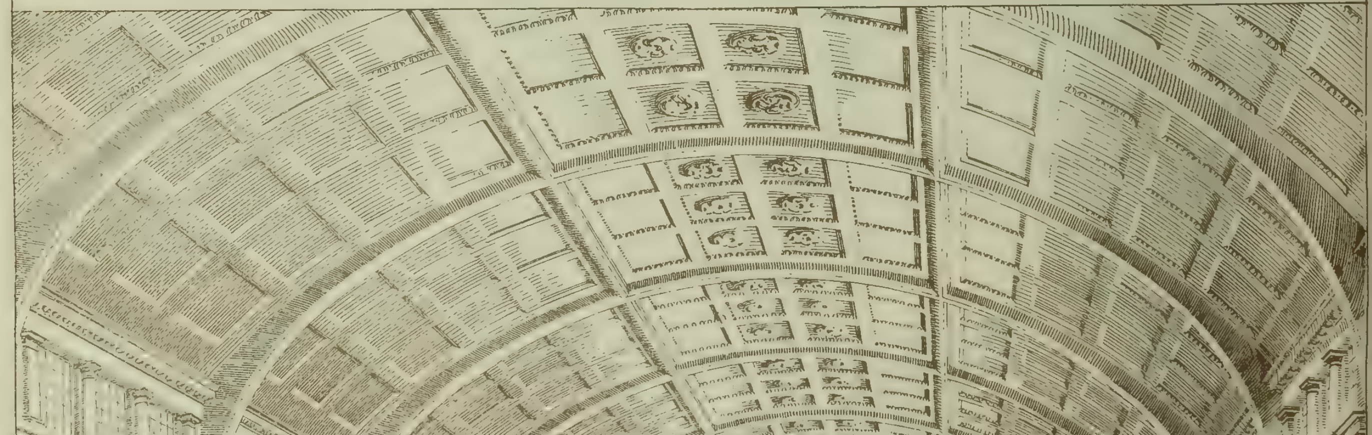


Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

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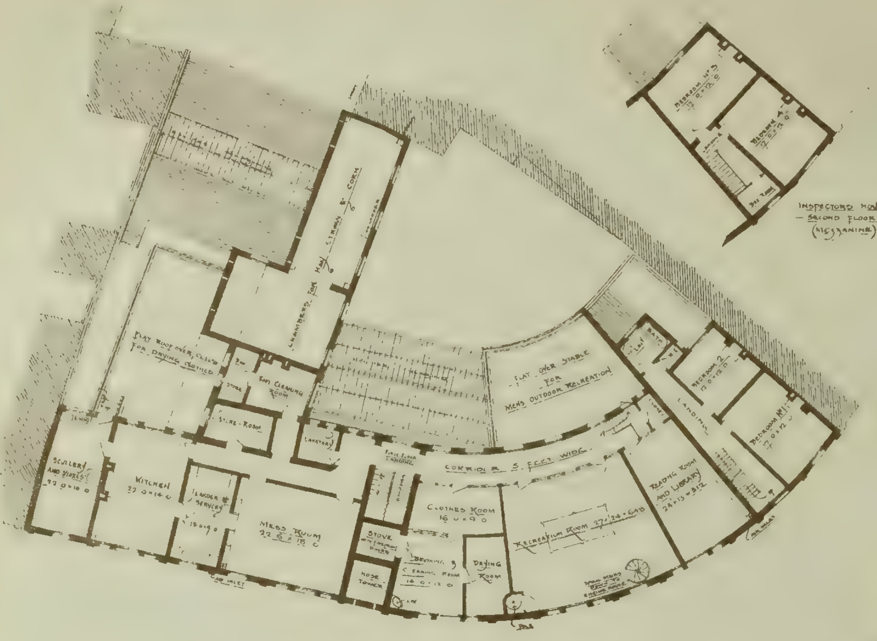
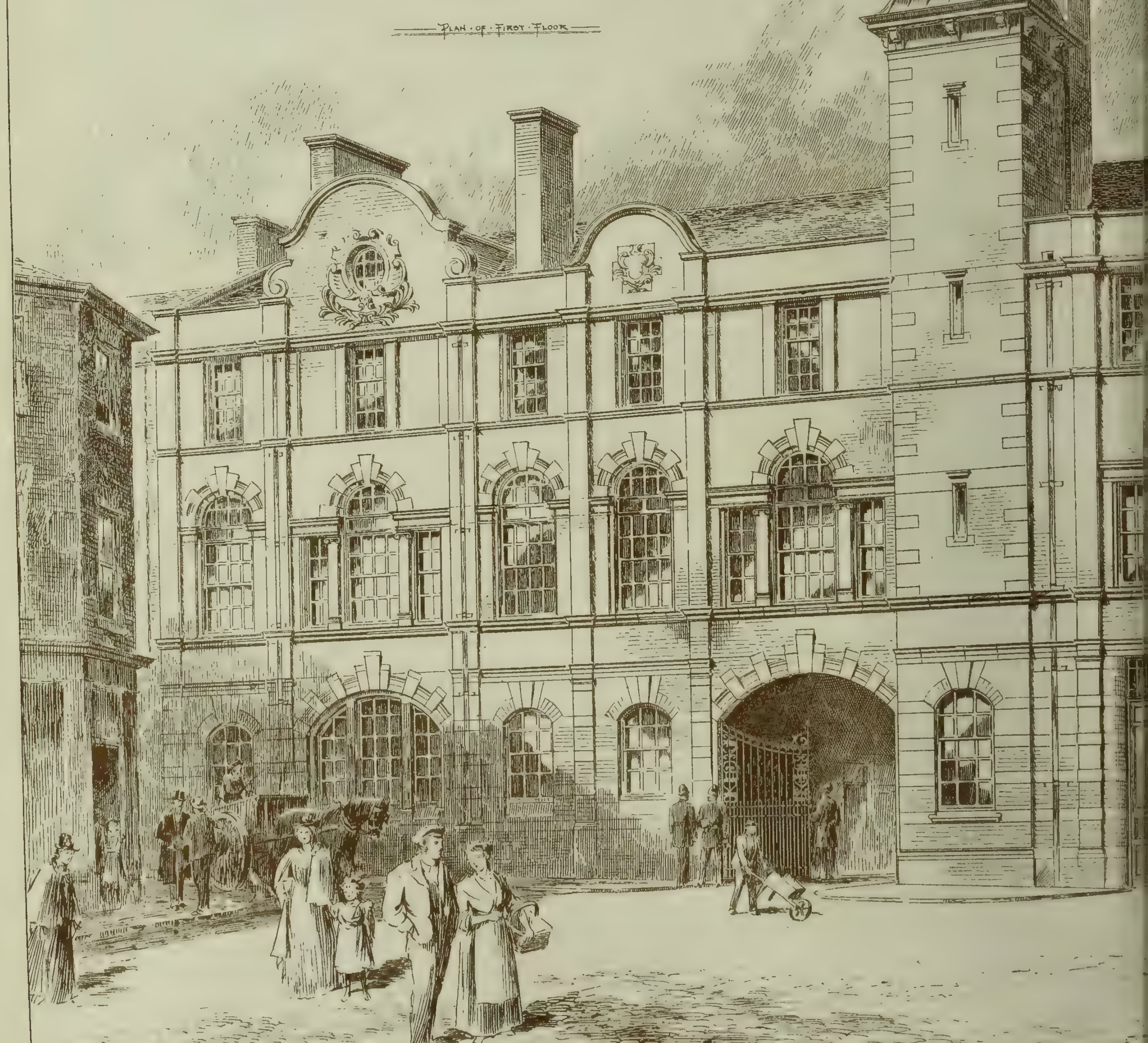

Bedroom No 3 17 0 × 12 0
Bedroom 4 17 0 × 12 0
Inspectors House – Second Floor (Mezzanine)
Chambers for Hay Straw & Corn
Flat Roof over, Used for Drying Clothes
Store
Boot Cleaning Room
Store-Room
Lavatory
Flat over Stable For Mens Outdoor Recreation
Bath
Bedroom 2 17 0 × 12 0
Landing
Bedroom No 1 17 0 × 12 0
Scullery and Stores 22 0 × 10 0
Kitchen 27 0 × 14 0
Larder & Servery 18 0 × 9 0
Mess Room 22 6 × 18 0
First Floor Landing
Corridor 5 Feet Wide
Clothes Room 16 0 × 9 0
Stove
Hose Tower
Brushing & Cleaning Room 14 0 × 12 0
Drying Room
Recreation Room 27' × 24 = 648
Reading Room and Library 24 × 13 = 312
Air Inlet

PLAN · OF · FIRST · FLOOR



SHEFFIELD
BAR · FIRE &
· STATION ·

NORTON
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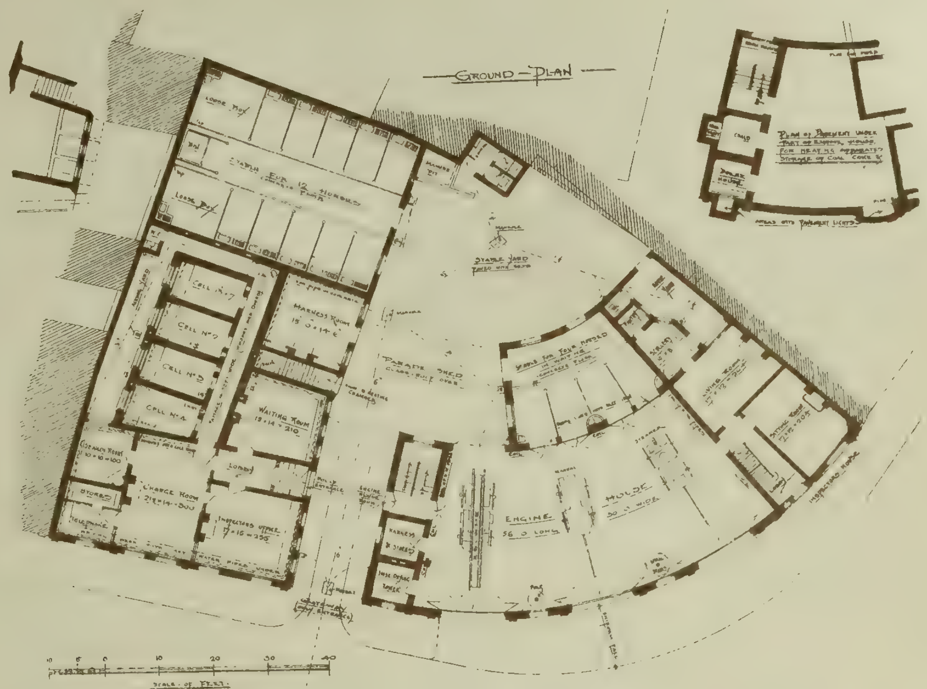


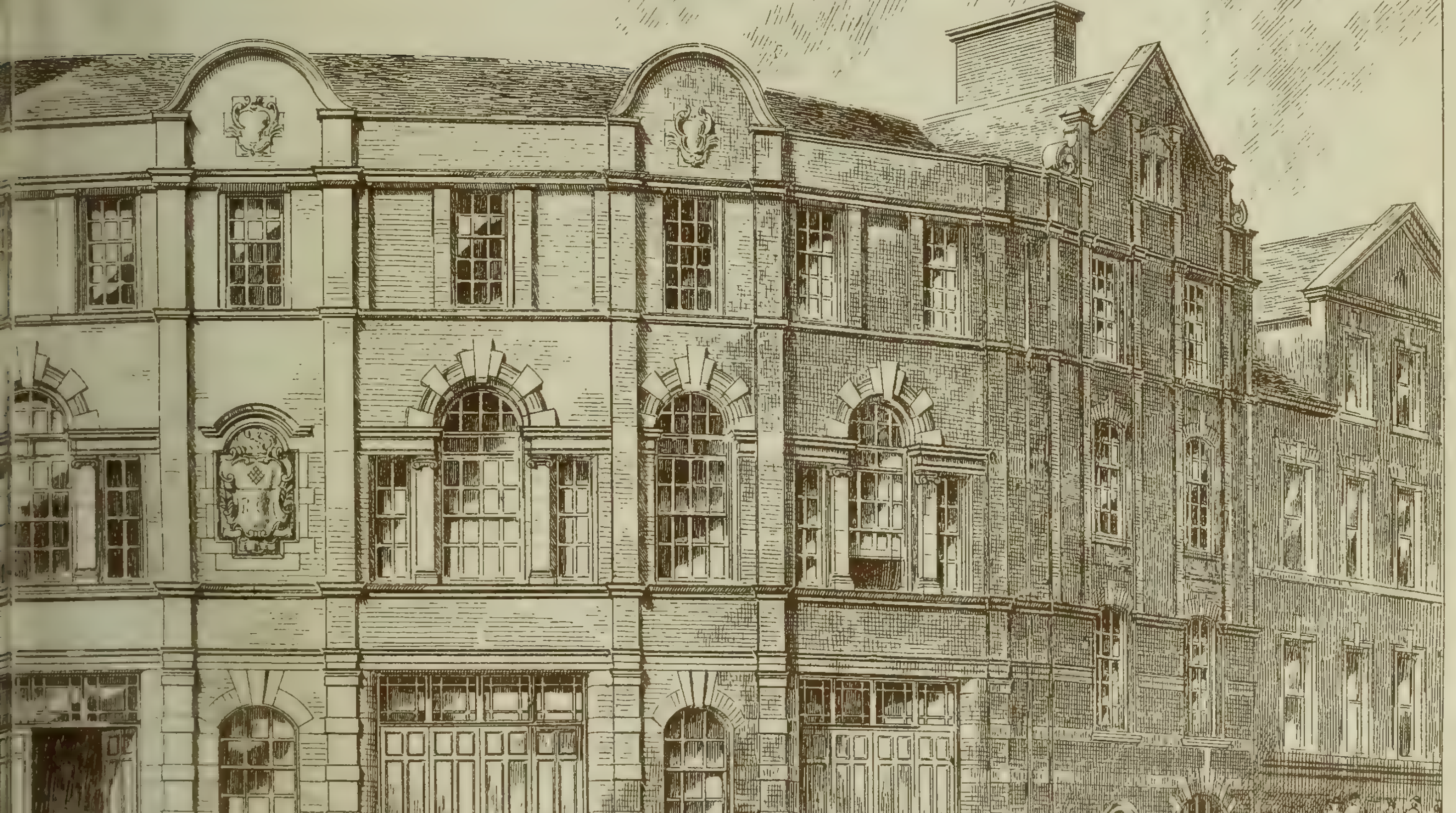
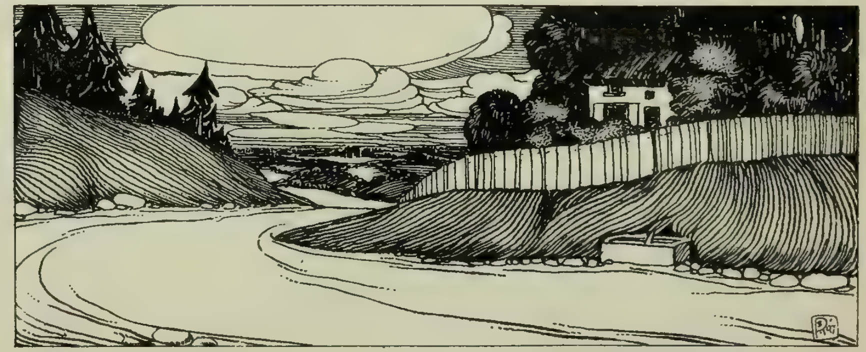
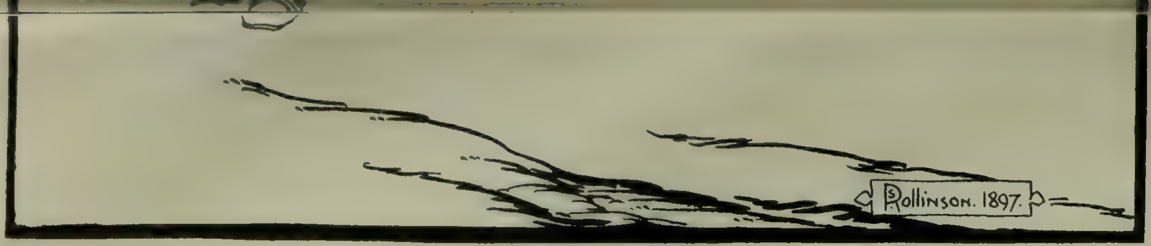
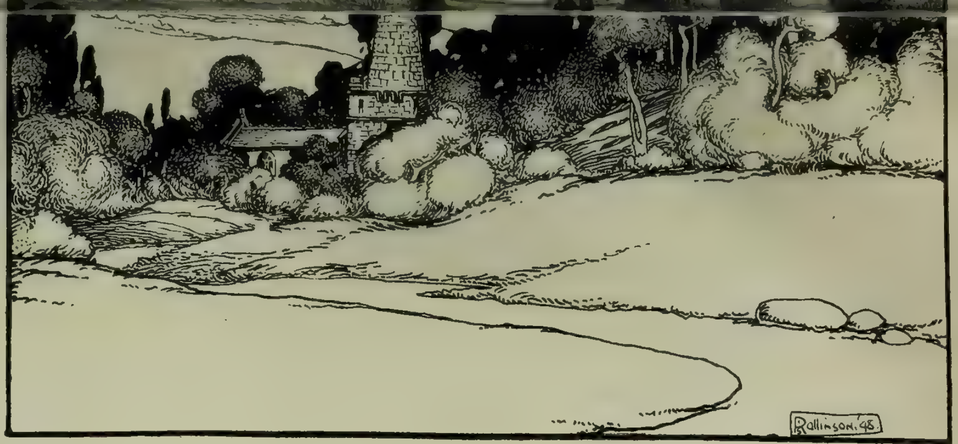


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C

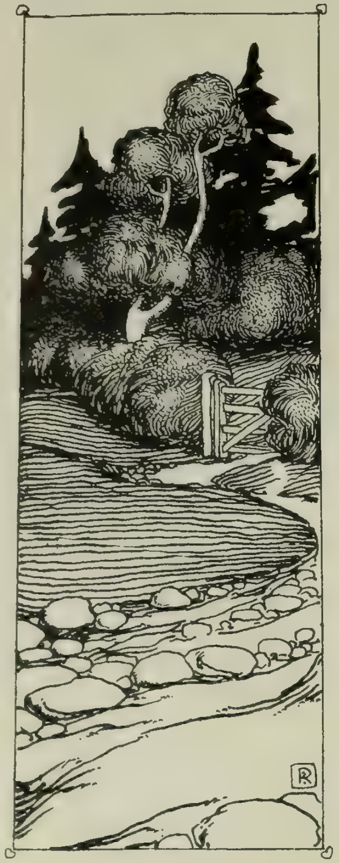


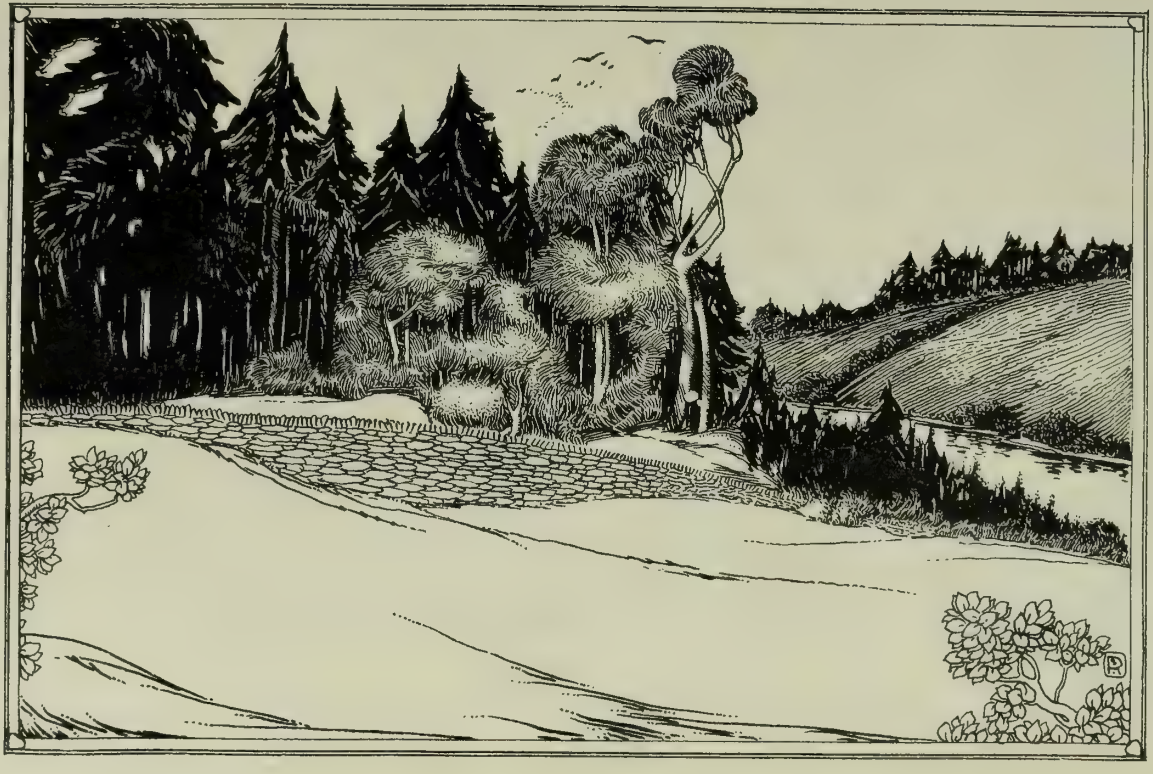

Rollinson. 1897.

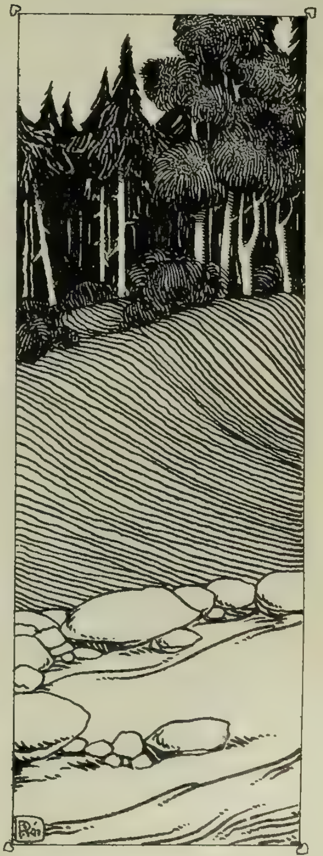

Rollinson. 98.

NATIONAL SILVER MEDAL DRAWINGS FOR BOOK ILLUSTRATIONS

BY SUNDERLAND ROLLINSON •







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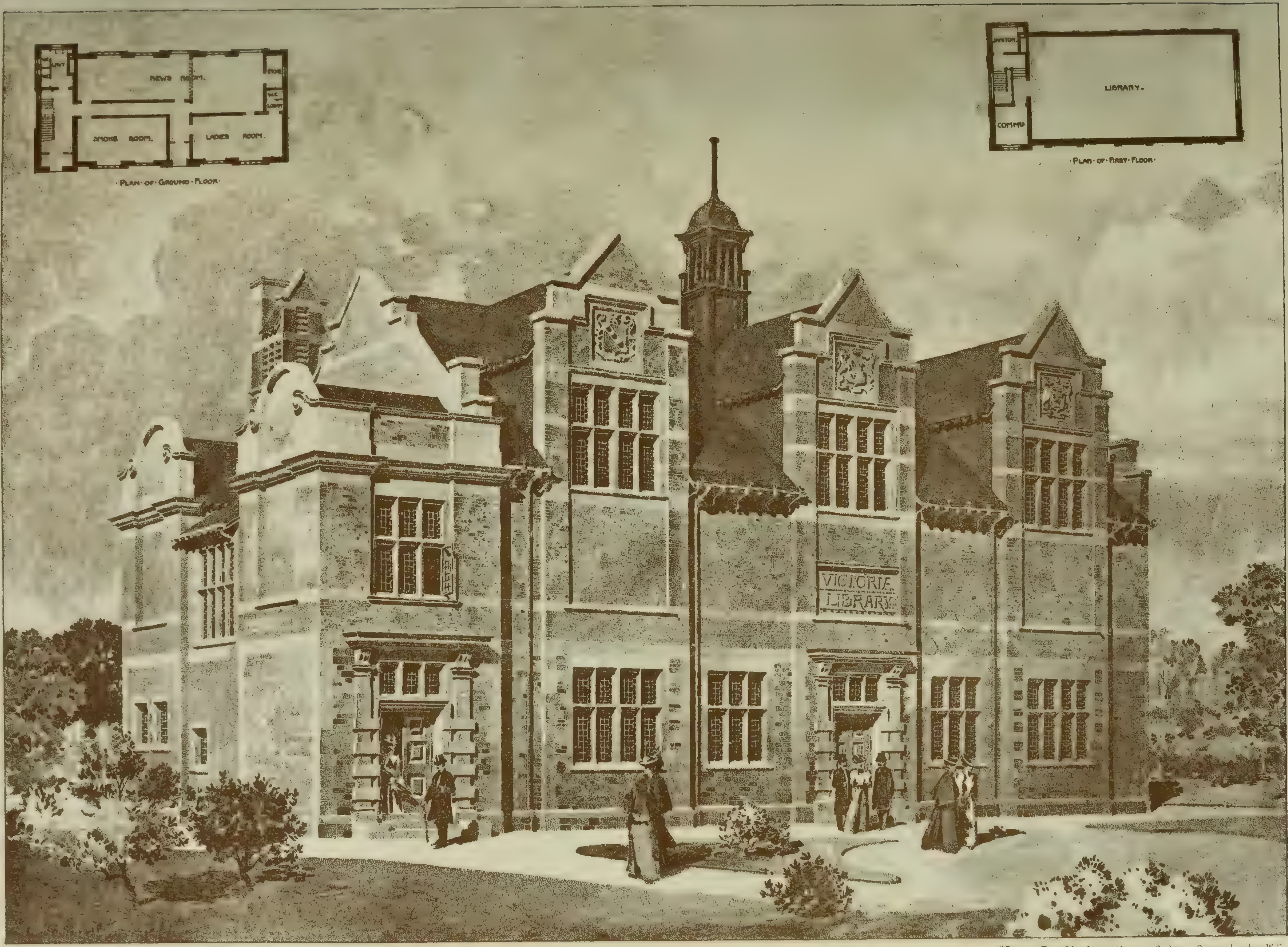
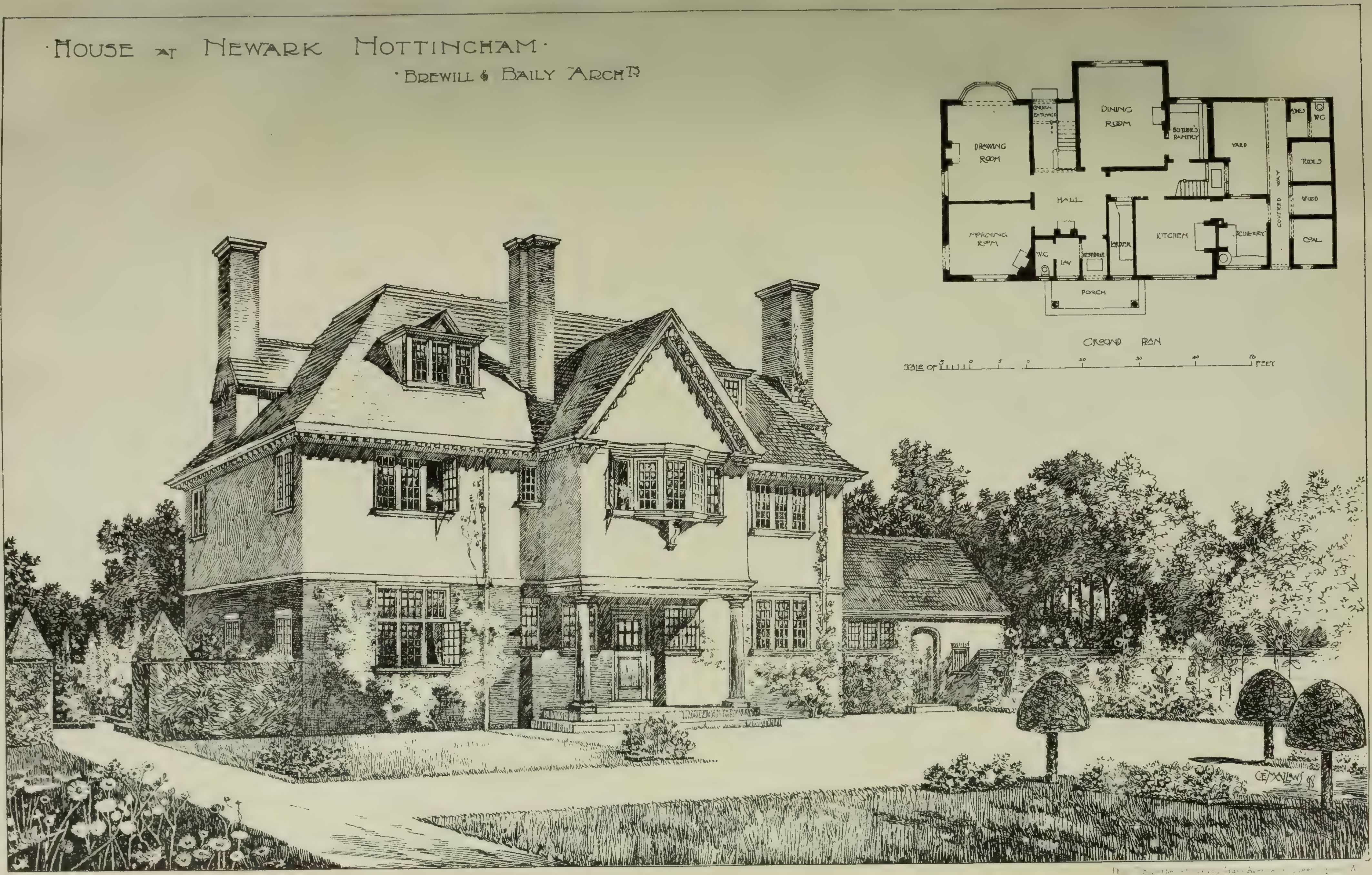


"Photo-Tint" by James Akerman 6 Queen Square London W.C.

VICTORIA LIBRARY · NEWCASTLE   J · W Dyson Archt

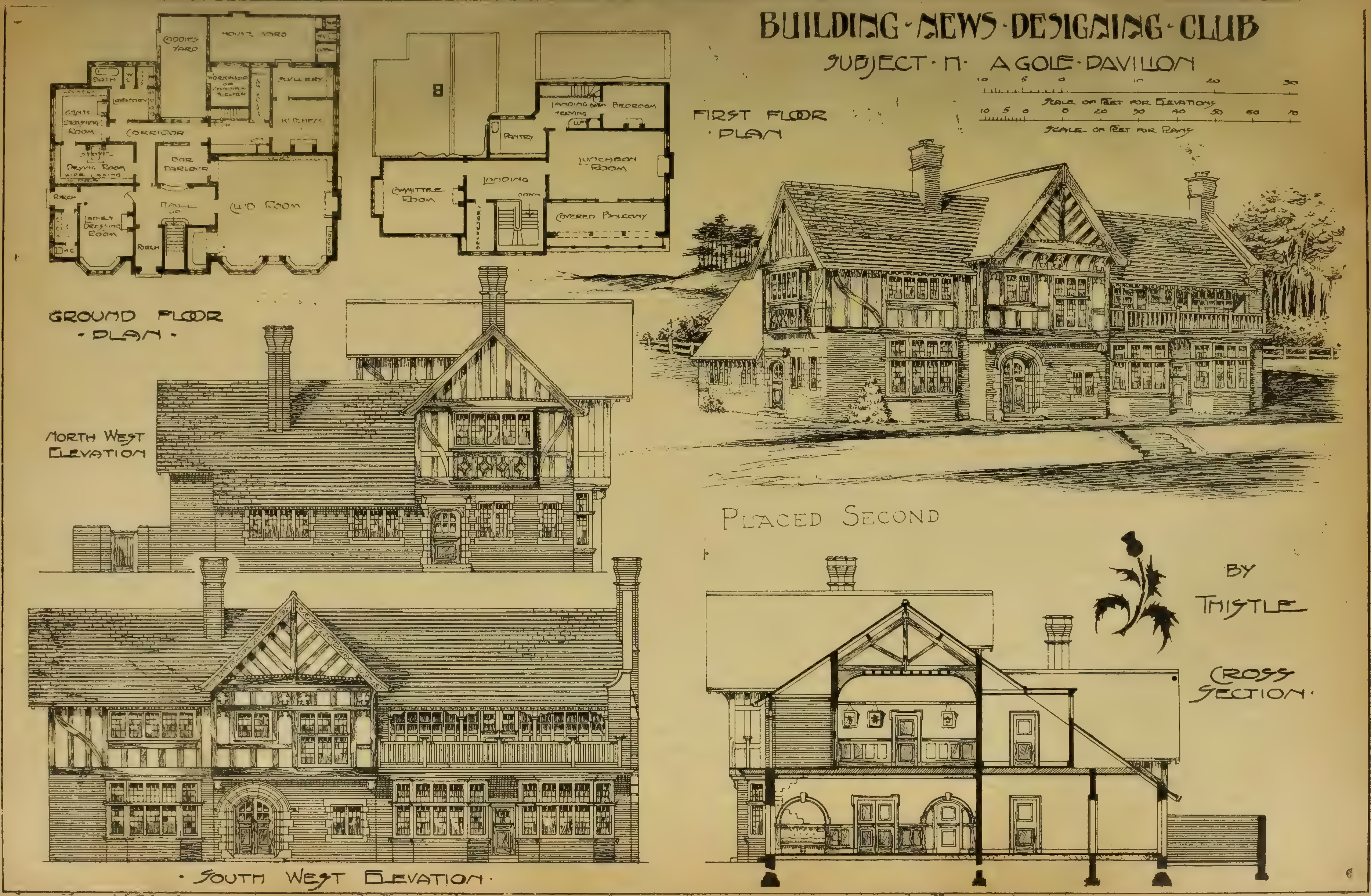
·HOUSE AT NEWARK NOTTINGHAM·

·BREWILL & BAILY ARCHTS



BUILDING · NEWS · DESIGNING · CLUB

SUBJECT · N · A GOLF · PAVILION



PLACED SECOND

BY THISTLE

Building Intelligence.

Edinburgh.—The memorial-stone of the new Congregational Evangelical Union Church in Bristo-place, which is to supersede the old Brighton-street Chapel, was laid on Saturday. The new church, the architects of which are Messrs. Sydney Mitchell and Wilson, of Edinburgh, is to be built in the Early Renaissance style, and will recall certain features of the old Tron Church. It is estimated to cost £5,000. The church proper will be on the first floor, which will be reached from the street level by a wide staircase. It will be seated to hold 600 people, and there will be galleries at the two sides, besides an organ-loft, the intention being to remove the organ from the old church to the congregation's new premises. On the ground floor will be a hall, which will accommodate 170 people. There will also be a classroom and a vestry, and the remainder of the frontage of the site will be used for two shops. The basement floor will contain a luncheon-room, a ladies' room, and offices. The Bristo-place front is to be divided into four bays, panelled with fluted pilasters, which will carry Ionic caps. Three-light windows will be inserted, with semicircular heads, and these will be filled in with tracery. Red polished stone will be used. The heating will be by hot pipes, and the building will be lighted and ventilated by means of electricity.

Folkestone.—On Tuesday, the 25th inst., the new building, specially designed and constructed on the East Cliff, Folkestone, for the carrying on of the work of Mrs. Mearn's Convalescent Home, was dedicated and opened by the Mayor of Folkestone, Alderman Salter, J.P., who was assisted by Sir Edward Sassoon, M.P. (Member for the division of the county). The building consists of three floors, inclosed with hollow walls and faced with red bricks, all dressings, strings, and baluster columns being of buff terracotta by Messrs. Stiff and Co., of Lambeth. The floors are fireproof; and the walls of all lavatories, bathroom, w.c.'s, kitchen, and other offices are lined with Newellite tiles. The building is heated throughout by a low-pressure hot-water system carried out by Messrs. Rosser and Russell, and is lighted throughout by electricity. The bedroom accommodation is designed so that each patient has a separate or private cubicle, and the opinion generally expressed is that the building is the most up to date of its kind. The architect is Mr. W. A. Hughes, of 3, Dean's-yard, Westminster; the builders being Messrs. Thos. Gregory and Co., of Clapham Junction.

Great Lever, Bolton.—Through the generosity of the late Rev. Thomas Loxham, M.A., Rector of Great Lever, the rapidly increasing district in the neighbourhood of Rishton-lane is being provided with a new church, school, and parsonage house. The foundation-stone of the church was laid by the Bishop of Manchester on July 12. The site, situated at the junction of Forester-street and Rishton-lane, has been given by the Earl of Bradford. The church will stand with the west front facing Rishton-lane, and the tower at the south-west angle of building will form a conspicuous landmark in the district. The church is arranged with lofty nave, with pillars and arcading of Bath stone, and side aisles, large chancel, transepts, and side chapel, vestries, and organ-chamber. The chancel is well raised. The accommodation provided is for between 600 and 700. The style is Late Decorated. The school is placed behind the church fronting Forester-street, and is a two-story building on the central hall system with classrooms at each side. It will accommodate about 450, but is arranged for future extensions to 650 places. A parsonage is also to be built in the vicinity. The materials thoughout are red bricks, and red Ruabon terracotta with North-country green slates. The joiners' work is to be of pitch-pine unvarnished. The contract for the building has been let to Mr. William Townson, of Bolton, and the works are being carried out from the designs, and under the superintendence, of Mr. R. Knill Freeman, F.R.I.B.A., Bolton and Manchester. Mr. W. Harlow is the clerk of works.

Harkstead.—The tower of this village church in the Samford Hundred, East Suffolk, is of Early Perpendicular date, with a beautiful Transitional west window, and is one of the finest of its kind in the county. Through a defective roof and other causes, serious decay became evident in the walling, and Mr. E. F. Bisshopp, architect and diocesan surveyor of Ipswich, was requested to draw up a report and specification for the necessary repairs. The work has been executed under Mr. Bisshopp's supervision, and the tower strengthened in such a way that it will now last for centuries. No ancient feature has been destroyed, and beyond some new facing on the north side there is but little external evidence of the restoration work. Included in the work is a new bell frame in English oak, this work having been performed by Messrs. Bowell and Son, of Ipswich. Mr. S. A. Kenney, Ipswich, has carried out the general building work. The chancel was restored in 1867 as a memorial of the Rev. Ralph Berners, who was rector of the parish for twenty-seven years; the nave was similarly dealt with in 1875, at a cost of £1,000.

Leeds. — The new city meat-market and slaughter-houses, which have been erected by the corporation in New York-street, were opened on Monday. The market has been erected from designs prepared by Messrs. Hanstock and Son, architects, of Leeds and Batley. The site contains 3,260 square yards, and it contains a market hall for sale of meat, a department for the corporation officials, slaughter-houses and lairages for beasts and pigs, tripery, &c., and cold stores and chill rooms (in the basement). The building has cost about £25,319 to erect, though in all a total of £40,860 has been expended. The wholesale meat market, which is the largest and most important of the departments, is 195ft. 4in. long, 45ft. wide, and its height is, to the eaves of the walls, 25ft. 8in., and from floor to ridge 41ft. 6in. It is divided into 22 stalls, with centre avenue from end to end, and has accommodation for hanging 1,100 sides of beef, and 1,540 sheep, pigs, or quarters. On one side of the market a separate door for each stall affords access direct from New York-street. Beyond the other side of the market, and separating the building from the slaughter-houses, is a covered roadway for carts and waggons. A set of overhead travelling rails connects the whole of the working departments with each other, so that from the slaughter of the beasts to the despatch of the carcases through the doors opening into New York-street—where they are loaded on to the carts for removal—the whole of the lifting and travelling is done by means of connected lines. The building is illuminated throughout by electricity.

Leek.—The Duchess of Sutherland has laid the corner-stone of a new school of science, commerce, literature, and domestic subjects, with which will be allied a department for instruction in various branches of silk manufacture. The designs for the new buildings were prepared by Messrs. W. Sugden and Son, and the contractor is Mr. Grace. On the ground floor there will be a chemical laboratory, domestic school, physical laboratory, manual instruction room, weaving shed, balance room, &c. The accommodation on the first floor will include science lecture theatre, with gallery, four classrooms, and other apartments, communications being provided with the Nicholson Institute. The master's room, situate on the first floor, is to be enriched with an ancient ceiling, removed from the now demolished 16th-century manor-house which formerly stood in the market-place at Leek; and another feature of antiquarian interest will be some very old painted chestnut wainscoting, which Mr. Larner Sugden rescued from the hands of the despoiler at the Chateau de Lormont, near Bordeaux, formerly the residence of the Archbishop of Bordeaux, and once the dwelling-place of the Black Prince. The cost has been between £9,000 and £10,000.

Rhyl.—Following the munificent gift of £10,000 to the Royal Alexandra Hospital by the Duke of Westminster, the building committee of that institution have signed the contract for the erection of the administrative block, the plans and all details having been prepared in readiness by the architects (Messrs. Waterhouse and Son, London). The contractors, who had their men on the ground, completing the ward block of the hospital, have commenced operations on the new portion, the erection of which is possible by the gift of the Eclipse Stakes by the Duke of Westminster. The whole of the plans for the hospital are complete, and the convalescent block will be proceeded with as soon as the necessary funds are forthcoming.

◆

The Bideford Board of Guardians have instructed Mr. R. T. Hookway to prepare plans for a new workhouse infirmary for 38 patients.

WATER SUPPLY AND SANITARY MATTERS.

Mid-Cheshire Sewerage Scheme.—The Northwich Rural Council had under consideration on Friday an important scheme, promoted conjointly with the Northwich Urban Council, for the sewering of Winnington and the Castle district of Northwich, and the formation of sewage works at Wallerscote. It was reported that an agreement had been entered into with Mr. Smith Barry, M.P., for the purchase by the two councils of 15 acres of land at the price of £350 an acre, subject to the consent of the Local Government Board being obtained to the scheme. The total estimated cost is £25,000, the rural council's proportion of which is £4,957. It was decided to apply to the Local Government Board for sanction to borrow this amount.

CHIPS.

Mr. Richard Jones, the town surveyor and inspector of nuisances for Redruth for many years past under the urban district council, died suddenly on Thursday in last week. He had been president of the local total abstinence society for many years, and also superintendent of the Wesleyan Sunday-school.

The Bishop of Manchester consecrated, on Friday, St. Paul's Church, North Shore, Blackpool. The new church has been built at a cost of £9,000. Messrs. Fielding, who gave the site, were the contractors, and Messrs. Garlick and Sykes the architects.

The Prince and Princess of Wales were present on Friday at the opening of the new buildings of the Alexandra Hospital for Children with Hip Disease, Queen's-square, Bloomsbury.

Mr. J. W. Morrison, assistant engineer at the Saltley Gasworks, Birmingham, has been appointed engineer to the Sheffield Gas Company.

The amount obtained by the sale of pictures at the Royal Academy this year has risen more than 33 per cent. The total sum realised was £21,000, against £13,000.

The town council of Sunderland have adopted, after a long discussion, a scheme for the erection of a new bridge over the Wear between the borough and the suburban district of Southwick. The estimated cost of the bridge, together with the purchase of property for approaches, is £129,600.

Viscount Knutsford opened last week the new college buildings connected with the London Hospital. The buildings stand on the site of the old chemical theatre, and have cost £10,000. In the basement is the department of public health. The biological laboratory and the materia medica museum occupy the ground floor, while on the first floor are the chemical theatre and laboratories and the balance-room. On the second floor are the physics laboratory, the chemical laboratory, the operative surgery room, and anatomy classroom. The bacteriological department, with the general laboratory, research laboratory, and sterilising room are on the third floor.

A widow named Endacott brought an action in the Queen's Bench, on Friday, before Mr. Justice Darling and a common jury, to recover damages from W. and J. Mackay, a firm of stationers at New Brompton, and W. A. Snow, a builder. Plaintiff had gone to the shop to purchase stationery, and, passing the door, she stumbled into a hole in the floor which was being made for a mat, and injured her ankle. For the defence it was stated that there was a notice which plaintiff could have seen, intimating that the shop was closed early on Wednesdays, and that she had contributed to the accident by her own negligence. After hearing the evidence, the jury assessed the damages to be awarded to plaintiff at £200. A question of law was reserved for further consideration.

Mr. Robert H. Bicknell, M.Inst C.E., Local Government Board Inspector, conducted an inquiry at Gainsborough, on Friday, into an application by the urban district council to borrow £4,500 for purposes of street reconstruction, and also into an application for leave to deviate from a scheme of street improvement already sanctioned, and for which loans amounting to £1,450 had been granted, so as to permit of a new road through Threadgold's-yard instead of through Barnaby's-yard.

The Earl of Morley's committee on unopposed Bills in the House of Lords passed on Monday the West Metropolitan Railway Bill, the object of which is to incorporate a company, and empower them to construct a branch line from Latimer-road on the Hammersmith and City Railway at Hammersmith to Acton, where it will run into the Great Western Junction Station. The Bill has already passed the Commons where it was opposed by the Goldsmiths' Company; but the opposition was withdrawn on the understanding that the Great Western and Metropolitan Companies would jointly insure the carrying out of the scheme.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

NOTICE.

Bound copies of Vol. LXXV. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV.. LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., and LXXV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

RECEIVED.—N. D. F.—B. B. and Co.—L. H. and Son.—S. W. M.—R. S. M. (Newport).—K. R. L.

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Intercommunication.

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QUESTIONS.

[12274.]—**Charge for Making Plans of Estates.**—Will any experienced reader inform me what is a fair charge for making a plan of a new estate showing the roads, plots, measuring the areas, &c.?—YOUNG SURVEYOR.

[12275.]—**Scagliola Marble.**—Is this a durable material, and how is it made and fixed round brick cores or iron stanchions? Any information will oblige.—A BUILDER.

[12276.]—**Timber Measurement.**—Are there any books or tables showing how many squares of deal of certain thicknesses go to the Petersburg standard, the number of loads and cube feet to a standard, and the price? Many of the tables I have consulted do not give the quantity of cube timber in a square of roofing or flooring of given scantlings.—A. Z.

REPLIES.

[12265.]—**Water in Cellar.**—I should be glad to give "Olev" the benefit of my experience if he will answer the following questions:—(1) Was the cellar dry when the work was first completed? (2) Have you seen the mouth of tile drain at connection with the main drain? (3) Is the tile drain 1ft. below the cellar floor? (4) What fall has the drain? (5) What is the subsoil? (6) Are there any land springs in the district? (7) What is the distance between your own houses and the next?—ALAFRED.

[12268.]—**Varnishing Wood-Block Flooring.**—I should not certainly varnish the wood paving. It is never varnished in good work. The glossy appearance pleases some people who like to see everything smooth and glossy; but it is not an artistic or natural treatment to varnish wood floors which are meant to walk over. It is not like a wall surface.—G. H. G.

[12270.]—**Bay Windows.**—You will do right to avoid any breach of regulation to give notice of your intention to build a bay window. The rules under the London Building Act allow bay windows to be erected on land belonging to the owner in streets of not less than 40ft. wide; they are not to project in any part within the prescribed distance of centre of roadway, or more than 3ft. from main wall of house, and are not to exceed three stories in height. (See section 73, sub-section 5.) The window is not to be within 3ft or 4ft. of the party-wall, nor to exceed in width three-fifths of the frontage of the building. Any departure from these rules has to be approved.—G. H. G.

[12271.]—**Sun-blinds.**—Write Messrs. G. A. Williams and Son, Queen's-road, Bayswater, W., for their catalogue of outside blinds and awnings.—ALLEN T. HUSSELL, Ilfracombe.

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CHIPS.

In our notice in a recent issue respecting the Tudor Hotel, Oxford-street, we omitted to state that the passenger lift and service lifts, which are of the most modern design and efficient construction, are by Messrs. Archibald Smith and Stevens, of Janus Works, Queen's-road, Battersea.

The London School Board have decided to take an experimental step in the direction of creating a works department similar to that of the London County Council. It has been agreed that the workmen engaged to alter the drains at one of the schools should be employed directly by the Board. The Board have also referred to a committee a letter from the County Council asking whether they could not erect dwellings for the housing of persons whose habitations had been acquired and demolished for School Board purposes.

The Camberwell Board of Guardians, under pressure from aggrieved ratepayers, have repented of their recent decision to adopt plans by Mr. Hall for the erection of a new workhouse infirmary to contain 300 beds, at an estimated cost of £208,000. At a special meeting of the board, the motion to proceed with Mr. Hall's plans was rescinded, and a committee of the whole board was instructed to procure plans for an extension of the existing infirmary on the Brunswick-square site, providing 400 beds at a cost not to exceed £125,000.

A destructive fire broke out at Mr. W. Keen's chair factory in High Wycombe just before midnight on Thursday, and in little more than two hours the factory had been burned to the ground, two rows of cottages had been completely gutted, nearly fifty families had been rendered homeless, and damage to the extent of £20,000, had been done. The factory was fully insured.

At Bridport, a new convent of the Sisters of the Congregation of the Visitation and a new boarding school for little boys were formally opened last week. The buildings are each three stories in height, and have cost about £5,000. The plans, which were prepared under the direction of the Rev. Canon Scoles, of Yeovil, provide indoor recreation, class and study rooms, dormitories, chapel, &c., for the accommodation of about 80 boys.

At Weaste, on the Manchester Ship Canal, new cold-air stores, which have been erected by the Colonial Consignment and Distributing Company, Limited, at a cost of £52,000, were opened on Friday. The stores provide 400,000c.ft. of refrigerated space. The machinery for refrigerating and for the generation of steam and electric light is duplicated in each instance, and there are two electric lifts. The new stores, which occupy an area of 3,000sq.yds., have been built by Messrs. Southern and Sons, from the designs of Mr. Charles Heathcote, architect, of Manchester.

The Bishop of Exeter laid, on Friday, the foundation-stone, the gift of the Mayor of Plymouth (Alderman J. Pethick), who has also offered to supply gratuitously the whole of the stone required for the building of the new church to be erected in Alexandra-road, Mutley, in connection with the Three Towns Church Extension scheme.

The foundation-stone of the new chapel for Trinity congregation was laid in North-street, Plymouth, on Friday. Messrs. Wiblin and de Boinville, of Old Town-street, Plymouth, are the architects, and Mr. J. Paynter, Plymouth, got the contract at £1,749. The new chapel, which will occupy a site of 100ft. deep, with a frontage of 38½ft., has been treated in the Early Gothic style. It will be built of brick, with stone dressings, and will seat 240 adults. The pews are of wrought deal, with bench ends, while the roof is of open wrought timberwork. The rostrum, reading-desks, and baptistery are to be removed from the old chapel in York-street and refixed in the new building.

A fire broke out early on Saturday at Bridlington Quay, on the premises of William Storr and Sons, cabinetmakers, and spread to the Wesleyan day-schools, the older portions of which were burned out. The damage is estimated at about £4,000.

The Gladstone National Memorial committee met on Saturday and conferred with Mr. Hamo Thornycroft, R.A., as to the statue for London. It was announced that the fund for the various memorials now amounts to £32,000. It is stated that the intended site of the statue is in the new thoroughfare from Holborn to the Strand.

LEGAL INTELLIGENCE.

SOUTH KENSINGTON ELECTRIC RAILWAY.—TOZER AND SON V. TALBOT.—This action, which was brought by Messrs. James H. Tozer and Son, railway plant contractors and iron and steel merchants, carrying on business at Finsbury-pavement, against Mr. George Talbot, railway contractor, to recover £15,210 as damages for alleged breach of contract, was heard by Mr. Justice Phillimore on Thursday and Friday of last week. Plaintiffs' case was that in 1897, the defendant, who was engaged in promoting a Bill in Parliament for the construction of an electric underground railway from Piccadilly-circus to South Kensington, agreed with them that in the event of the Bill passing he would buy all the iron and steel required for the construction of the railway through them, and that he would pay them 10 per cent. commission on the iron segments, bolts, nuts, and washers to be used in the construction of the tunnels. The Bill passed, and the defendant entered into a contract with the company to construct the railway for £385,174. As the company did not succeed in raising the required capital, the defendant transferred his interest in the contract with the company, and plaintiffs said that in consequence of defendant's action they had lost 10 per cent. on £152,100, the market price of the segments, bolts, nuts, &c., required for the railway. Plaintiffs further claimed £400, as money lent by them to the defendant. The defendant denied that the plaintiffs were entitled to claim for loss of commission, and said that if there was a contract between him and the plaintiffs it was conditional upon his constructing the railway. As to the claim for money advanced, defendant paid £400 into court. Mr. Justice Phillimore in delivering judgment, said he was in a difficulty in assessing the damages because there was no evidence before him that the railway would ever be constructed. However, he thought the plaintiffs were entitled to something more than nominal damages, and, therefore, he entered judgment for them for £250 beyond the £400 paid into court.

PROPERTY IN A PARTY-WALL.—At the Newcastle-on-Tyne County-court, on July 17th, before his Honour Judge Greenwell, Herbert W. Irvine, of Wolsingham-road, brought an action against Turnbull and Dickinson, builders, claiming damages for trespass, and an injunction. Counsel said the alleged trespass was committed by the defendants building against the plaintiff's gable wall, and making use of the same without the plaintiff's permission. The building was built on the Ashburton Estate, upon one of two sites sold in 1876 to Mr. Pyle, and the boundary was the middle of the gable, and he admitted that the half of the gable for which he was now seeking to recover payment was built upon the defendants' land. In 1892, the building society with whom the house and land were mortgaged took possession of the house and land, and conveyed the house to the plaintiff, Mr. Irvine. The remainder of the estate was sold by the building society to the Ashburton Estate Company, who agreed to sell to the defendants the site next to Mr. Irvine's house. Mr. Irvine's claim was for the cost of the half-gable which was erected upon the defendants' site when his house was erected. Mr. Robson proceeded to quote legal decisions in similar cases, and referred to a case decided by the late Judge Digby Seymour, which was appealed against, with the result that the appeal was dismissed. Other cases were quoted with the object of showing that if the owner of a site built a party-wall he should be repaid half the cost of the party-wall from the owner of the adjoining site. Pyle obtained his land from the original owner of the estate, Pyle mortgaged to the building society, and the building society assigned to Irvine. He submitted that Irvine thus acquired all the original rights, and was the man entitled to be paid. His Honour said the question was whether Pyle's rights passed to the mortgagees, and were assigned by the mortgagees to Irvine in 1892. Mr. Robson said that was his contention. By the Act of 1881, it was so. Mr. Ward, for the defence, said the question affected the present system of conveyancing. The question was: When a builder sold a house to a purchaser, did he sell the house plus the right to recover the half-cost of the gable? His Honour: Suppose he did not, where is he, having sold the house with the gable standing upon anybody else's land? What right has he to set up? Mr. Ward: He can still recover, as they do every day, from whoever builds on the adjoining land, the value of the gable. His Honour: There was no question that you would have to pay this money; the only question is as to whom it shall be paid. Mr. Ward said that was so, but there was nothing to show that the right to recover was conveyed with the conveyance of the plaintiff's site. Edward George, house agent, said that, in circumstances like those involved in the present case, if the builder sold the house, the cost of the gable was, notwithstanding this, paid not to the purchaser, but to the builder. Witness added that he was concerned in a case in which a house was built twelve or fourteen years ago, and had changed hands twice; but the cost of the half-gable was payable to the original builder' who retained the half-gable when he sold the house. His Honour gave judgment for the plaintiff. There was a dispute as to the value of the gable. The plaintiff claimed £25, and the defendants said the wall was worth £12 19s. 11d. It was directed that, if the parties could not agree as to the value, it should be decided afterwards by his Honour or by a referee.

A Hathersage Building Arbitration.—Mr. Edward M. Gibbs, architect, of Sheffield, has published his award in an arbitration heard by him as umpire on June 5 and 6. Mr. Ambrose Melland, builder, of Hathersage, claimed that there was a substantial amount due to him from Mrs. E. A. Whitworth, wife of Mr. F. H. Whitworth, of Hathersage and Sheffield, over and above his contract price for the erection of two villas for Mrs. Whitworth on the Castleton-road. Mrs. Whitworth's case was that she had paid Mr. Melland all he was entitled to, and that he was liable to her for certain work which she alleged was unfinished. The umpire has ordered Mrs. Whitworth to pay Mr. Melland the sum of £169 within three weeks, and also to pay Mr. Melland's costs as between solicitor and client, and finds that there is nothing due to Mrs. Whitworth from Mr. Melland.

Faulty Flats.—The Camberwell Vestry were the complainants at Lambeth Police-court on Friday in several summonses against Mr. J. F. Thompson, the owner of a block of newly-erected flats in Avenue-road, Camberwell, known as Thompson's Mansions. On one summons the vestry complained that some soil-pipes were carried up in such close proximity to a water cistern as to expose the water to the risk of contamination, and the defendant was ordered to pay a penalty of £10 and 2s. costs. On another summons, for permitting the premises to be occupied without first obtaining a certificate that the same had a proper and sufficient supply of water, the defendant was ordered to pay a penalty of £5 and 2s. costs. A third summons having reference to a rainwater pipe was dismissed, with £1 1s. costs against the vestry. With respect to the two summonses which the magistrate had decided against him, Mr. Thompson intimated that he should appeal.

Hull Arbitration Award.—Mr. R. Hodgson, the arbitrator in the claim by Mr. James Fargus, seed crusher, Hull, against the Hull Corporation in respect of a wharf taken for approaches to a bridge over the river Hull, was sent to the parties interested on Monday. Mr. Hodgson fixed the value of the property taken at £1,525, and he further found that the claimant was entitled to £1,297 for severance of the wharf from his mill in Oxford-street.

Exempted Buildings at the Crystal Palace.—At the Penge Petty Sessions, on Tuesday, the Crystal Palace Company appeared by Mr. W. Gardiner, their secretary, to answer four summonses issued at the instance of the London County Council for having, contrary to the provisions of the London Building Act, 1894, erected four stables for polo ponies within the grounds of the Palace without first obtaining the approval of the Council. Mr. Horace Avory appeared for the prosecution; and Mr. Cunningham Glen for the Crystal Palace Company. Mr. Avory said the summonses were taken out for the purpose of testing a question, which he understood the Crystal Palace Company were desirous of raising, as to whether they were subject to the provisions of the London Building Act of 1894. Part 7 of the Act related to temporary buildings and wooden structures as distinguished from permanent buildings, and the London County Council had treated the buildings forming the subject of these cases as being temporary buildings. The question as to whether the Palace was exempt was a question of law, and he referred to the case of "Elkington v. Smee," which was argued some years ago, and related to the erection of a tobogganing slide at the Crystal Palace. In the 1855 Act there was no exemption for the Palace or any of its buildings. In 1881 the Palace authorities claimed to be exempted from the provisions of the Metropolitan Building Act of 1855. Section 21 was the only clause that gave them exemption at all, and that referred to "the main building, conservatories, and waterworks of the company, and the conveniences and other works immediately connected therewith." The learned counsel went on to contend that stables for polo ponies were not "conveniences" or "other works immediately connected therewith," meaning the main building. The fact was that the company were in just the same position now as they were in 1881. They forgot to get exempted in the Act of 1855, and they got a clause inserted in 1881, when the district surveyor called their attention to it; but when the Act of 1894 was passed there was no exemption in that. The only question was whether section 82 of the Act of 1894 applied to this case. Evidence having been given by Mr. J. G. R. Murray, surveyor to the London County Council, and Mr. George Elkington, district surveyor for Penge, Mr. William Gardiner, secretary to the Crystal Palace Company, was called for the company. Mr. Glen contended that the toboggan case was altogether different to the present one, the Divisional Court having found in effect that an independent company had no right to the exemption to which the Crystal Palace Company was entitled. The Legislature had treated the Crystal Palace Company in the same way in which they dealt with railway companies, considering them thoroughly competent to deal with these things, and as unlikely to erect dangerous structures. It was not necessary to find any special exemption in the London Building Act of 1894. The chairman said the case raised a very interesting point, and the Bench would take a few days to consider their decision.

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CHIPS.

The city council of Bristol adopted on Tuesday a report from a committee recommending the erection of a public swimming bath in Maze-street, Barton Hill, at an estimate cost of £12,100.

Mr. Charles Perrin, M.I.C.E., inspector from the Local Government Board, recently held an inquiry at Chesterfield into an application of the town council for sanction to borrow £1,600 for the erection of a refuse destructor at their sewage farm, Newbold.

In the Royal Exchange Hotel, Hood-street, Newcastle, on Monday night, a meeting of local builders, convened by Mr. Edward George, was held, for the purpose of considering Judge Greenwell's decision in the case of Irving v. Turnbull and Dickinson, a report of which appears under our Legal Intelligence in another column, and to take such action in respect thereto as might be deemed advisable to protect the builders' interests. The meeting was held in private.

At a meeting of the building committee of St. Thomas's Church, Telford Park, Streatham, held in the vestry of the iron church on the 17th inst., the tender of Mr. G. Minter, of Ferry Works, Johnson-street, amounting to £2,070, for the foundations only of the permanent structure, was accepted, and the architects, Mr. Sidney R. J. Smith, F.R.I.B.A., and Mr. Spencer W. Grant, A.R.I.B.A., were instructed to proceed at once with the work.

The half-yearly report of the engineer to the City and South London Railway, announces progress in the northern and southern extension of the system. As regards the Moorgate-street extension, the tunnels, permanent way, and underground stations are all completed. The surface stations and the lifts are well advanced, and it is hoped to open the extension for public traffic in October next. The tunnels on the Clapham extensions of the main line are all driven. The station tunnel at Clapham Common is completed, and that at Clapham-road is in progress, and this extension will be open for traffic early in the ensuing year.

The Bible Christian Chapel at Eastleigh, Hants, which has been enlarged to double its former size, was formally reopened on Wednesday week. The enlargement has been carried out at a cost of £300, and the building will now seat 200 worshippers. The new portion of the building has been erected by Mr. Haines, of West End, Southampton.

A new higher grade school at Wood Green, Tottenham, was opened on Saturday. It has cost £3,500 for site, and £19,047 for the building.

At Hexham Abbey Church, a stained-glass window was unveiled on Sunday in memory of the late William Kirsopp, a local solicitor.

Messrs. Demaine and Brierley, architects, York, are designing bank fittings and preparing premises at the Grove, Ilkley, for the City and County Bank, Ltd.

The town council of Edinburgh has under consideration a recommendation that land adjoining Saughton Hall, 90 acres in area, be purchased as a public park; the price is about £50,000.

The first sod of the Isle of Axholme light railway was turned on Friday at Epworth. The line will be 14 miles in length, and will extend from Haxey, on the Great Eastern, and will connect with the North-Eastern Railway at Goole, *viâ* the Marshland light railway. Twelve previous lines have been projected to serve Epworth, and have been abandoned. The estimated cost of the present scheme is £133,000. Mr. Kaye is the engineer, and Mr. S. W. Meyer the contractor.

At the District Council Offices, Swinton, on Friday, an inquiry was held by Colonel J. T. Marsh, R.E., inspector from the Local Government Board, with reference to the council's application for sanction to a loan of £1,993 for improvements at Victoria Park, Swinton. The park, together with the hall, which is used as the council's offices, was purchased in 1896 for £6,500, and the loan now proposed is for fences and laying out the park. Mr. Henry Entwisle, surveyor to the council, gave evidence in support of the application, explaining the estimates.

Our Office Table.

An exhibition of pictures by J. W. M. Turner has been brought together by Mr. Whitworth Wallis at the Birmingham Art Gallery. Sir Donald Currie has lent no less than twenty-five works, including the remarkable series of illustrations of Campbell's poems; Mr. John Edward Taylor lends twelve; the Manchester Whitworth Institute four; Mrs. George Holt, the Rev. W. Macgregor, the Rev. Stopford Brooke, the Hon. F. D. Smith, and Messrs. Stephen G. Holland, Richard M. Brocklebank, and A. Severn each two; and Lord Armstrong, Sir J. C. Robinson, Sir W. Agnew, Sir Horatio Davies, and Messrs. S. L. Raphael, James Ross, Abel Buckley, F. S. Ellis, R. D. Holt, E. Steinkopff, T. Mackenzie, Edward Nettlefold, and Jesse Haworth each one. The oil-paintings in the collection now in the long room of the Art Gallery at Birmingham (many of which were on view this spring at the Guildhall Gallery in the City) illustrate Turner's work over a period of just fifty years, the earliest being the broad, solemn "Kilgarran Castle" of Lord Armstrong, painted in 1799; the latest, "The Wreck Buoy," painted in 1849, when he was an old man of 74 and faculties were beginning to fail.

Mr. Robert Carfrae, Montrave Villa, Murrayfield, has just presented an important example of the art of the late David Scott, R.S.A., to the National Gallery of Scotland at Edinburgh. Mr. Carfrae is the possessor of several of Scott's best works. He gave the pick of them to the trustees; the Curator (Mr. Robert Gibb, R.S.A.) selected the picture known as 'The Traitors' Gate," but the original title of which is "The Duke of Gloucester entering the Water Gate of Calais," and the Board of Manufactures unanimously accepted the gift, which will shortly be hung in the National Gallery. David Scott, who was born in 1806, and died in 1849, was a son of Robert Scott, an Edinburgh engraver of repute, and a brother of the well-known artist, Mr. W. Bell Scott. This picture of the "Traitors' Gate" was begun in 1841, and was exhibited in the following year. The Duke of Gloucester, brother of John of Gaunt, was suddenly arrested by order of Richard II., hurried on board a ship in the river, which conveyed him to the prison of Calais, where he disappeared. The painter shows the doomed man in a small boat, with his armed warders, passing the gloomy portal, with its iron grill, of the vaulted passage leading from the sea to the prison. Gloucester, in courtly robes, sits in the stern of the boat; behind him are armed men, and in front stalwart rowers. David Scott is already represented in the Scottish National Gallery by three works—"A Vintager," "Ariel and Caliban," and "Paracelsus Lecturing on the Elixir Vitæ." A large picture of his, "Vasco da Gama Doubling the Cape of Good Hope," which was in the Scottish Academy's exhibition of 1849, was, after the death of the artist, purchased by subscription and placed in the Trinity House, Leith, where it now hangs.

A new room, devoted to the memory of the heroes of Arctic Exploration, was opened to the public in the National Portrait Gallery on Saturday. The room, which is situated at the further end of the east wing, is filled with portraits bequeathed by Miss Sophia Cracoft, niece of Sir John Franklin, and Colonel John Barrow. The Barrow collection contains the large picture, by Stephen Pearce, entitled "The Arctic Council discussing a Scheme of Search for Sir John Franklin." The group contains portraits of Sir George Back, Sir William Parry, Captain Bird, Sir James Ross, Sir F. Beaufort, Mr. Barrow, Captain W. A. Baillie-Hamilton, Sir J. Richardson, and Captain F. W. Beechey. There are fifteen additional portraits of explorers and others connected with the voyages of Sir John Franklin, among them being those of Sir Robert M'Clure, Captain William Penny, Sir F. Leopold M'Clintock, and Sir George Nares, each in Arctic dress. Of six of the paintings, the replicas were already in possession of the Institution, and these have now been transferred to Kensington Palace, the originals being retained in the Gallery. The Cracoft bequest comprises the picture of Sir John Franklin by Thomas Phillips, R.A., and that of Jane, Lady Franklin, by Miss Romilly, and there are twenty other portraits by Stephen Pearce. An account of Franklin's voyages, compiled, with the assistance of Sir F. Leopold M'Clintock, by Mr. Lionel Cust, is placed in the room.

An experiment with station street-indicators is being made on the Dingle electric tramways route at Liverpool by the corporation of that city, which offers a useful suggestion to the London County Council. The street-indicators now being laid down at Liverpool consist of an ornamental and conspicuously coloured pavement 4ft. square, formed of red granitic concrete, surrounded by a border of white granitic concrete ornamented with an incised foliated design. The square is conspicuous from a distance, and can readily be seen by every pedestrian. Each indicator contains (first) the name of the street or road, legible under all conditions of weather and at all times of day and night—in itself a marked improvement on the iron street name-tablets sometimes placed beyond the limits of vision and at night illegible to all. An arrow indicates the direction of the cars, so that no one need make the common mistake of taking the right car going in the wrong direction. "Tramcars stop here on request" appears on the indicators other than those at which "All tramcars stop," as at terminal and a few other fixed points on the route. This is followed by a concise statement of the destinations of the various cars. The whole of this lettering is in white characters on a dark red background. The indicators to equip the Dingle route (40 in number) were devised by Mr. C. C. R. Bellamy, the manager of the corporation tramways in Liverpool, and have been made by the City Mosaic Company, Lord-street, to the order of the Liverpool Tramways Committee, the concrete work involved being done at the headquarters of the Stanley Land and Brick Company, Stanley.

Mr. Lewis Angell, F.R.I.B.A., the veteran sanitarian, who for thirty-two years has held the position of borough engineer and surveyor of West Ham, was last week called upon by the town council to resign, and has been offered a quarter's salary in lieu of notice. The report containing the recommendation was brought up by seven members who had been appointed to consider the reorganisation of the engineer's department. Although no reasons for the dismissal were given in the report, it was stated that the committee thought the time had arrived when a younger man should be appointed. After an angry and undignified discussion, in which recriminations were freely bandied to and fro, the recommendation of the committee was carried, with the addition that Mr. Angell be appointed consulting engineer, without salary, but that he should be paid adequate remuneration for any services he may be called upon to perform in connection with work in hand and services in the sewage dispute with the London County Council. A Mr. Morley was appointed as engineer *pro tem.* Notice has been given to rescind the resolutions.

An interesting exhibition of pictures and works of decorative art was recently opened in Abbot Hall, Kendal, by an address from Canon Rawnsley, and will remain open until August 26. Kendal is the centre of a district where a strong revival of the arts and crafts has taken place, and a special effort has been made to bring together a representative exhibition. The last display held in Kendal, some eight years ago, was competitive in character, and consequently not free from a taint of amateurism; but the present one is noncompetitive, and primarily educational, most of the work shown being professional. The exhibits include some 72 oil-paintings, and nearly twice as many works in water colours, by such well-known artists as Thomas Huson, William Aumonier, Matthew Hale, and others, woodcarvings, tapestry and embroidery, stained-glass cartoons, hammered brass and ironwork, pottery, tile panels, choice examples of bookbinding, and many other classes of industrial and decorative art.

Visitors to the city of Winchester are now able to inspect the ancient subterranean passage to the Castle, used for defensive purposes in bygone days. For many years it has been inaccessible, owing to the accumulation of débris and the ravages of time. Acting on behalf of the Hampshire County Council, Mr. E. Avery has had all this rubbish cleared out, and has made good the old steps. The massive passage follows a zigzag course, and at the angles there formerly stood massive gates, which were barred with oaken bolts of immense size and strength, run into sockets, which, with the hinges of the gate, can yet be seen. The original outlets have been blocked up by modern buildings, and the passage into the city itself is closed through the giving way of certain arches; but what has been done now enables visitors to explore the route for a considerable distance.

The Eighteenth Autumn Congress of the Sanitary Institute will be held this year in Southampton, under the presidency of Sir Wm. H. Preece, K.C.B., F.R.S., Pres.Inst.C.E., by invitation of the mayor and corporation, commencing on Monday, August 29, and closing on September 5. The proceedings will, as usual, be divided into three sections:—Section I.: "Sanitary Science and Preventive Medicine," having as its president Sir Joseph Ewart, M.D.; while of Section II., "Engineering and Architecture," Mr. James Lemon, M.Inst.C.E., F.R.I.B.A., F.S.I., is the president, and over Section III., "Physics, Chemistry, and Biology," Professor Percy J. Frankland, F.R.S., will preside. Conferences will be held of municipal representatives, port sanitary authorities, medical officers of health, medical officers of schools, engineers and surveyors to sanitary authorities, veterinary inspectors, sanitary inspectors, and ladies (on domestic hygiene). A lecture will be given before the congress on "Tuberculosis," by Dr. Malcolm Morris, and a popular lecture on "Glasgow Infectious Diseases Hospitals," by Bailie J. Dick, J.P.

A large expansion joint, used on a pipe line belonging to the Hamilton Cataract Power Company, at DeCew Falls, was described by Mr. William Hemphill in a paper recently read before the Engineering Society of the School of Practical Science at Toronto. This steel pipe is 735ft. long, 8½ft. in diameter at the top, and 7½ft. at the bottom. The plates are ¼in. thick at the top of the line, and 1⅜in. at the bottom, both transverse and longitudinal seams being double riveted. At its upper end the rock bottom was excavated to a depth of from 8ft. to 10ft., and the pipe anchored in the trench by heavy flanges riveted to it and bedded in concrete. Screens were placed at the upper end to keep out ice and drift-wood. Every 15ft. down the side of the mountain on which the pipe is laid blocks of masonry were constructed as supports. About two-thirds of the way down there is a ledge on the mountain about 60ft. wide, which the pipe follows for some distance and then runs down at an angle of 20° to the power-house, where there is a bend of nearly 90°. Near the edge of the ledge of the mountain there is an expansion joint resting in a hollow in the masonry support. The two sections of the pipe slide one inside the other. An iron ring fastened with angle iron forms a sliding joint. There is a 12in. opening through which water passes so as to afford hydraulic pressure against the end of the wooden ring, causing a little spring in the joint at the latter point. The combined action of the spring in the iron and the pressure of the water takes up any elongation or contraction which may occur. It was found necessary to pack the joints with wooden rings 6in. or 7in. thick; when the wood swelled it stopped the leakage to a large extent, but will not allow much movement of the joint. There is an iron ring around the pipe which is flanged and riveted to the plate to form another sliding joint.

MEETINGS FOR THE ENSUING WEEK.

Saturday (to-morrow).—Society of Architects. Visit to Canterbury and St. Margaret's Bay, Dover. Leave Victoria 10 a m.

Architectural Association. Visit to Guildford Almshouses, St. Mary's Church, Guildhall, Abbott's Hospital, &c. Meet at Waterloo Main Line Booking Office at 1.30 p.m. for the 1.50 train.

Mr. R. H. Bicknell, C.E., held an inquiry on Friday at Rawmarsh, relative to an application of the urban district council for powers to borrow £6,800 for purposes of gasworks extension.

Dr. Tristram, Q.C., Chancellor of the Diocese of Canterbury, has held a court at the parish church, Sidcup, Kent, in reference to a faculty for the rebuilding and enlargement of the parish church there. Several witnesses were examined, and the Chancellor gave special directions as to the removal of the remains of 21 persons and the preservation of over 30 memorial tombstones. The works, when completed, will cost £10,000.

The Marquis of Dufferin and Ava has had a tombstone placed in the north aisle of Wells Cathedral on the grave of Mrs. Sheridan, the wife of Richard Brinsley Sheridan.

Trade News.

WAGES MOVEMENTS.

The Dispute in the Building Trade.—At the Salisbury Hotel, Fleet-street, London, a conference was held on Wednesday between six representatives of the National Federation of Building Employers and six representatives of the National Association of Operative Plasterers with reference to certain questions in dispute between the builders and plasterers. Mr. E. T. Cook occupied the chair. The various points at issue were fully discussed, the meeting lasting over four hours. The proceedings were private, but at the close the secretary of the employers' association stated that as regards the application for an advance of wages in Manchester, it had been arranged that Mr. Deller, the secretary of the Society of Operative Plasterers, should visit that city with reference to the differential charges existing in the towns of Rochdale, Stalybridge, and Ashton-under-Lyne. The question will then be referred to the executive of the Lancashire and Cheshire Federation, to be dealt with by them during the next six days.

Bolton.—The strike of Bolton stonemasons, which has existed for several weeks, the men demanding 10d. an hour and the employers offering 9½d., has taken a curious turn. During last week delegates from the men's executive in London were in Bolton endeavouring to effect a settlement, and they succeeded so far as the masters are concerned. The men, however, declined to accept their advice, and at a meeting of the employers on Friday it was reported that the operatives had intimated their intention not to return to work under the settlement as agreed upon between the Lancashire Federation Executive and the operators' executive. The London delegates, considering they had done their best, informed the local branch of their intention to stop strike pay on and after Saturday, and that they were quite agreeable that the settlement affecting Bolton should be the one adopted last year as between themselves and the Lancashire Executive—viz., 9½d. per hour, and no restriction on worked or sawn stone. The employers opened all the yards on Monday, and took men on 9½d., the strike, they say, being at an end so far as the two executives are concerned.

Leicester.—A serious disturbance took place at Leicester on Friday in connection with the strike of bricklayers for a halfpenny per hour advance. A procession of several hundred men paraded the town according to custom since the strike, and at West Humberstone stone-throwing was resorted to at buildings where a number of men were engaged. It continued for some time, and a number of men were injured and had to take refuge in the inner rooms before the police arrived.

The Yorkshire Building Dispute.—At a meeting of the Yorkshire Federated Building Trade Employers, held at Leeds on Thursday in last week, to consider the suggested withdrawal of the Yorkshire lock-out, it was decided to withdraw the lock-out of 25 per cent. of the men, in accordance with the wishes expressed at the Plymouth Conference, from and after Saturday. Work was therefore arranged to be resumed on Monday; but on that day an entirely unforeseen complication arose, and instead of the locked-out men returning to work, as was expected, the Amalgamated Society of Carpenters and Joiners withdrew their members from all the Federation shops in Leeds. The men affected number 400. The hitch, however, was of brief duration, for on Wednesday the men resumed work on the receipt of a telegram and letter from Mr. W. Nicholson, on behalf of the Yorkshire Federation, to Mr. Chandler, general secretary of the Amalgamated Society of Carpenters and Joiners.

The Lock-out in Denmark.—Another 2,000 men were locked out in Denmark on Monday, in connection with the big dispute now going on in that country. The object of the employers is to destroy the federation of trade unions which has secured so strong a hold on the workmen of the country. Practically all the workpeople in the country are members of the federation, which numbers 80,000. Forty thousand were locked out eight weeks ago, and thus three-fourths of the members of the federation are idle. Funds are being urgently appealed for, and now the federation, in order to husband its resources, is sending 13,000 children to farmhouses in the country, paying its members in the shape of food, and suspending strike benefits to single young men, who are therefore leaving the country in very large numbers for Sweden, Norway, Germany, England, and the United States. The London Trades Council has collected and despatched £400 for the aid of the locked out, and the Amalgamated Society of Engineers has sent £800 to the engineers in Denmark, who have not until now been compelled to ask for assistance from the general fund.

LIST OF COMPETITIONS OPEN.

Halifax—Twelve Shops, Commercial-street	£50, £25	Barstow and Midgley, Solicitors, 8, Harrison-road, Halifax	Aug. 1
Crystal Palace—Bandstand (Assessor)	30gs., 15gs., 7gs.	W. Gardiner, Sec., Crystal Palace Co., Sydenham, S.E.	„ 8
Watnall Chaworth and Watnall Cantelope—Sewerage Schemes		C. J. Spencer, Clerk, Public Offices, Basford, Notts	„ 17
Kircaldy—Infectious Diseases Hospital, Fosterton Farm	No premium	Alexander Beveridge, District Clerk, Kircaldy	„ 17
Wharfedale—Isolation Hospital	£30 (merged), £15	C. V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Dumfries—Public Library		John Grierson, Town Clerk, Dumfries	„ 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	„ 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	„ 16
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 30
Dunoon, N.B.—Sheriff Court House (£5,000) and Police Buildings (£3,500)	£30, £20	M. Sinclair, County Clerk, Lochgilphead	—
Beeston—Church and Sunday Schools		C. Nichols, St. John's-grove, Beeston, Notts	—
Parsonstown—Water Supply (6,000 population)		H. Barlow, Clerk, Town Hall, Parsonstown	—

LIST OF TENDERS OPEN.

BUILDINGS.

Pontycymmer—Workmen's Institute	Flaldau Trust Fund	P. J. Thomas, Architect, Bridgend	July 29
Goldsworth—Altering Robin Hood Inn		William G. Lower, Architect, 12A, High-street, Guildford	„ 29
West Bromwich—Repairs to Chaplain's House	School District Managers	Thomas Rollason, Architects, High-street, West Bromwich	„ 29
Kingston-on-Thames—Alterations, Assize Courts		Harold A. Winser, Town Clerk, Clattern House, Kingston-upon-Th.	„ 29
Lelant—Rebuilding the Praed's Arms Hotel	Ellis and Co.	Oliver Caldwell, Architect, Penzance	„ 29
Chorley—Wing to Cottage Hospital		W. H. Dinsley, Architect, Cleveland-street, Chorley	„ 29
Whittingham - Auction Mart	Farmers' Auction Mart Co.	Wm. Robson Hindmarsh, Architect, Alnwick	„ 29
Ladock—Alterations to Buildings		Nansawsan, Ladock, Cornwall	„ 29
South Shields—Slipway, Lifeboat House, &c.	Tyne Lifeboat Institution	J. P. Spencer, C.E., 13, Grainger-street West, Newcastle-on-Tyne	„ 29
Pontyclun—Chapel		Rev. A. Knight, Talbot-road, Llantrisant	„ 29
Gurnos—Engine Shed	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	„ 29
Southowram Bank—Sunday School and Caretaker's House		Joseph F. Walsh, Lancs and Yorks Bank Chambers, Halifax	„ 29
Glasgow—Golf Clubhouse, Bellahouston Park	Corporation	A. B. M'Donald, City Eng., City Chambers, Cochrane-st., Glasgow.	„ 29
Leeds—Raising Roof, Chapeltown Tramway Depot	City Council	The City Engineer's Office, Municipal Buildings, Leeds	„ 31
Pontefract—Two Villas	John Shaw, J.P.	Garside and Pennington, Architects, Pontefract	„ 31
Londonderry—Six Houses, Rosemount-avenue		52, Great James-street, Londonderry	„ 31
Kingston-on-Thames—Alterations to Old Workhouse Buildings	Guardians	William H. Hope, Archt., Union Offices, Portsmouth-rd., Kingston	„ 31
Belton—House	J. D. Downing	Chas. G. Baker, Architect, Great Yarmouth	„ 31
Glasnevin—Training Establishment	National Education Commissioners.	The Secretaries, Education Office, Marlborough-street, Dublin	„ 31
North Huish—Cattle-Houses and Repairs		T. Wakeham, Court, Aveton Giffard	„ 31
Leeds—Second Story to Kirkstall-road Tramway Depot	City Council	The City Engineer's Office, Municipal Buildings, Leeds	„ 31
East Preston—Alterations to Boiler House, &c., at Workhouse	Guardians	H. Howard, Town Office, Littlehampton	„ 31
Aldershot—Six Cottages, Cannaught-road, Redan Hill		Arthur E. Crowe, Surveyor, Station Approach, Guildford	„ 31
Henley-in-Arden—Shed	Wootton Wawen & Beaudesert S.B.	John Lord, Clerk, Henley	„ 31
Cardiff—Warehouses, Millicent-street	J. Isaac	Edgar G. C. Down, A.R.I.B.A., 31, High-street, Cardiff	„ 31
Llanharran—Fourteen Cottages		L. V. Evans, Court House, Pencoed	„ 31
Bradford—Four Loose Horse Boxes, Harris-street	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	„ 31
Pontefract—Additions to House and Shop, Roper-gate	Stuart Lowden	Garside and Pennington, Architects, Pontefract	„ 21
Liverpool—Extension of Warehouse, North Mersey Goods Station	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	Aug. 1
Salop—Four Cottages near Marsh Brook Station	Joint Railways Committee	The Joint Engineer, Shrewsbury Station	„ 1
Peterson—Cottage at Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 1
Harrogate—Four Houses, Tewitt Well Estate	Mrs. F. B. Atkinson	George W. Atkinson, Architect, 1, Mark-lane, Leeds	„ 1
Strabane—Business Premises		M. Hammond, Bridgetown, Strabane	„ 1
Oldham—Boiler-House, &c., Supply Station	Electric Lighting Committee	A. Andrew, Gas and Water Offices, Oldham	„ 1
Hereford—Extension of Roofing at Station	Joint Committee	A. E. Bolter, Sec. to Joint Committee, Paddington Station, London	„ 1
Selby—Alterations to School of Art		J. T. Atkinson, Clerk, Churchyard, Selby	„ 1
Petersfield—Laundry	Laundry Co.	Arthur J. C. Mackarness, Secretary, High-street, Petersfield	„ 1
Swansea—Generating Station, Strand	Corporation	The Borough Surveyor, 13, Somerset-place, Swansea	„ 1
Huddersfield—Dwelling House, Fisher-street		J. Berry, Architect, 9, Queen-street, Huddersfield	„ 1
Mallow—Repairing Cottages	Rural District Council	M. Regan, Clerk, the Workhouse, Mallow	„ 1
Epsom—Repairs and Alterations to Bow House	Guardians of Epsom Union	H. D. Searleswood, F.R.I.B.A., Epsom	„ 1
Bishop Auckland—Farm Buildings at Windlestone Farm		F. H. Livesay, Architect, Newgate-street, Bishop Auckland	„ 2
Sutton-on-Trent—Laying Floor	School Board	T. E. Day, Clerk, Sutton, Notts	„ 2
Bradford—Warehouse and Stabling, West Bowling		Brayshaw and Dixon, Architects, Bowling Old-lane, Bradford	„ 2
York—Stables for 82 Horses	North-Eastern Railway Co.	William Bell, Architect, York	„ 2
West Bowling—Warehouse and Stabling		Brayshaw and Dixon, Architects, Bowling Old-lane, Bradford	„ 2
Brighton—Five-Roomed Artisans' Dwellings (28), St. Helen's-rd.	Town Council	Francis J. C. May, M.I.C.E., Town Hall, Brighton	„ 2
Stratford-on-Avon—Vagrant Wards at Workhouse		Thos. T. Allen, Architect, 2, Broad-street, Stratford-on-Avon	„ 2
Middlesbrough—Central Electricity Station	Electric Lighting Committee	Milnes and France, Architects, Bradford	„ 2
Bishop Auckland—Institute at Rushyford		F. H. Livesay, Architect, Newgate-street, Bishop Auckland	„ 2
Homerton, N.E.—Repairing Offices, Sidney-road	Hackney Union Guardians	W. A. Finch, Architect, 76, Finsbury Pavement, E.C.	„ 2
Darwen—Central Stores	Provident Co-operative Soc. Com.	Sames and Green, Architects, Knott-street, Darwen	„ 2
Bishop Auckland—Alterations, &c., Windlestone Hall		F. H. Livesay, Architect, Newgate-street, Bishop Auckland	„ 2
Hull—Hydraulic Pumping Station	North-Eastern Railway Co.	Wm. Bell, Company's Architect, York	„ 2
Tudhoe Grange—Cookery Room	School Board	G. W. Rogers, Architect, Spennymoor	„ 3
Halifax—Ironfoundry, Albert-road		Jackson and Fox, Architects, 7, Rawson-street, Halifax	„ 3
Batley—Bakery, Clerk Green-street	Batley Co-operative Society	H. B. Buckley, Architect, 8, East-parade, Leeds	„ 3
Folkestone—Alterations, &c., North Board School	School Board	Alfred H. Gardner, Clerk, 8A, Cheriton Place, Folkestone	„ 3
Withington—Works to Workhouse Schools	Chorlton Union Guardians	David S. Bloomfield, Clerk, All Saints', Manchester	„ 3
Elland—Chamber over Brick Kiln at Storth Brickworks		Sharp and Waller, Architects, 32, Bradford-road, Brighouse	„ 3
Cudworth—Elementary Schools (700)	School Board	G. Moxon, Architect, 26, Church-street, Barnsley	„ 3
Manorhamilton—Repairs to Workhouse and Fever Hospital	Guardians	Mr. Peter Keany, Clerk, Board-room, Manorhamilton	„ 3
Egremont—Shop and Warehouse, South-street		J. S. Stout, Architect, Gillfoot, Egremont	„ 4
Treorchy—Six Workmen's Cottages, Ynyswen-terrace		Jacob Rees, Architect, Hillside, Pentre	„ 4
Horfield—Baptist Church and Classrooms	Building Committee	Milverton, Drake, and Pizey, Architects, Baldwin-street, Horfield	„ 5
Lisnaskea—Five Labourers' Cottages	Rural District Council	J. O'R. Hoey, Clerk, Rural District Council, Lisnaskea	„ 5
Ipswich—Additions, Borough Fever Hospital	Public Health Committee	E. Buckham, Borough Surveyor, Town Hall, Ipswich	„ 5
Friarton, Perth—Gasworks	Gas Commissioners	A. Gillespie, Engineer, 34, St. Enoch-square, Glasgow	„ 5
Burntisland—Secondary School	Burgh School Board	Robert Little, Architect, 4, St Brycedale-avenue, Kirkcaldy	„ 5
Keighley—Residence, &c., Holycroft		W. H. and A. Sugden, Architects, Keighley	„ 7
Abertillery—Additions to Infants' School	Aberystwith School Board	R. L. Roberts, Victoria Chambers, Abercarn	„ 7
Bynea, Wales—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 8
Halifax—Extension of Premises	J. H. Waddington	Jackson and Fox, Architects, 7, Rawson-street, Halifax	„ 8
Penygraig—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 8
Hendford—Goods Shed and Offices	Great Western Railway Co.	G. K. Mills Secretary, Paddington Station, London	„ 8
Sheffield—Additions to Car-Sheds	Tramways Committee	Charles F. Wike, C.E. City Surveyor, Town Hall, Sheffield	„ 8
Withington—Station Buildings	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 8
Tonyrefail—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 8
Peckham, S.E.—Offices, Lyndhurst-road and Peckham High-st.	Amalgamated Society of Engineers.	C. Thompson, Architect, 203, Graham-road, Hackney	„ 9
Hexthorpe—Infant School (350)	Balby-with-Hexthorpe S.B.	The Architect's Office, 11, Priory-place, Doncaster	„ 9
Pilsley—Wesleyan Sunday schools		A. E. Eyre, Architect, St. Chad's-road, Derby	„ 9
Leeds—Alterations to Offices, Pease's Buildings	Board of Overseers	Bedford and Kitson, Architects, Greek-street Chambers, Leeds	„ 9
Hendon—Repairs to Workhouse Buildings	Guardians	F. J. Seabrook, Clerk, Union Offices, Edgware	„ 9
Mayford, near Woking—Manual Room, and Alterations to Swimming Bath at Industrial School	London County Council	The Architect's Department, 13, Spring Gardens, S.W.	„ 10
Lochboisdale—Alterations, Castlebay School	Barra School Board	J. Hill, Banker, Lochboisdale	„ 10
Wrexham—Ward at Infirmary	Committee	Lockwood and Sons, Architects, Chester	„ 10

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PERFUNCTORY ART.

RUSKIN has somewhere said: "Had you been anything else in the world but architectural designers, you might have been of some use and good to people"—a sentence which conveys a good great deal of truth in a sarcastic way. It is an attack, indeed, on the modern professional architect and his methods. In our own day the art he professes has been denied a place by the side of the other arts—of the sister arts of painting and sculpture. Those who are vociferous for Architecture have asserted her claims in such a manner as to make the public think the art is not what it is said to be—hence it has sunk low in public esteem, so that this kind of self-exaltation, or prattling about the dignity of modern architecture, falls rather flat, and has done something to discount the reality of the real thing. We have less of these apologists now: there are more earnest workers in the field—men who work to convince the public that real architecture is not quite extinct, as some imagine.

There are still many things that have tended to lower the estimate of the art. One is the Philistinism of the British public; the attempt to be artistic without cost or sacrifice of any sort; the miserable utilitarian spirit of the age; the desire to adorn halls and rooms with what Mr. Ruskin ironically calls "furniture sculpture," which the parlourmaid dusts every morning—not the real sculpture that one sees in the tympana of the Parthenon or of Notre Dame; and to fill our rooms with copies of the Great Masters, often atrociously painted, or the modern furniture and bric-à-brac of Wardour-street. All this taste is enfeebling enough, and has done serious harm to the cause. Then another cause is the overcrowded state of the profession. Where there was only one architect or artist three hundred years ago there are now hundreds practising in our large towns, and, as someone has well said, we cannot increase the ratio of genius to the greater number; it will always be a fixed quantity, and no amount of cramming or examinations will ever make it larger. No; the mediocrities in everything, art included, will always predominate and rule. The public will be always swayed by the prevailing taste of the mediocrities, and therefore the standard of architecture is lowered proportionably to the larger number of professing artists.

But there is something beyond these influences which has made the art so much less of a power than it once was. It has broken with tradition which united the arts when the sculptor and architect were one; when, for example, Scopas practised both as architect and sculptor, Iktinos joined the crafts in the temple at Phigaleia, and Pheidias combined the arts in the Parthenon. All has now been subjected to modern analysis; every art is now labelled, pigeon-holed, or reduced to principles by the modern art grammarian till we find it bereft of all the imaginative qualities or poetic interest. Architects still speak of their art as Classic, English, or Flemish Renaissance, "Queen Anne," "Georgian"; or of Gothic as belonging to one or other of the periods, "Early English," Decorated, or Perpendicular. Even these generic distinctions of style are often labelled by the characteristics of the country—as French, Gothic, Italian, or Venetian Gothic. If it were possible, these divisions and distinctions would go on multiplying for the convenience of the compilers of our art manuals and the cataloguists of our museums. In construction, this subdivision and classification is also adopted, and the simple intuition of weight and thrust known to the Mediæval builders of Amiens or Salisbury are now explained and illustrated by mechanical laws and graphic statics, in which each force is measured, and its resultant found with a precision that was unknown to the men who designed the vaults and proportioned the buttresses of our cathedrals. So that in art, as in construction, everything is taken to pieces, and resolved into elements and analysed. Even ornament itself, which would seem to elude such investigation, is now analysed by the art grammarian; we have books and grammars of ornament, in which its elements are subjected to analysis, and its root forms discovered, and the students of our art schools go through a scientific course of study for ornament. But was it thus that the great ornamentalists of the ages we copy went to work, that the old stone and wood carver, or the designer of the old textiles, were taught their craft? The geometric and subtle patterns of the Moorish artists, and the refined arabesques of the Renaissance were the arrangements of men who never had any scientific training; they were inventions deriving their beauty and subtlety of line from a close study of nature or the Greek model.

Let us briefly inquire what are the reasons alleged for the poverty of modern design. It is not, as Mr. Ruskin says, owing to the want of sculpture that makes our buildings so unattractive, for we can point to many great buildings—like St. Paul's and Westminster Abbey, to Salisbury and Wells—which without sculpture, or in spite of what they possess on their western façades, are still noble and grand in their expression. Fine sculpture in itself has little effect in adding to the beauty of the design of those edifices. Bad sculpture, it has been well said, fails to ruin the imaginative effect of our great buildings, and good sculpture can contribute little to a badly designed building. Everyone must admit that the art of sculpture has languished in this country because it has been dissociated from architecture. What is known as sculpture is a cultivation of academies, quite unsuitable for our climate. We cannot compete with our French neighbours or with other countries; and our models and groups, whenever we try them in position, are pronounced failures. Why? Partly because we have ceased to employ sculpture in our buildings. The art was once glyptic, and was gradually developed from masonry. The sculptor received his training in the mason's workshop, learned geometry as well as anatomy, and was, in fact, a figure-mason. The ancient Greeks were true sculptors: they learned the glyptic art in the mason's workshop, and hence there is no word in Greek to distinguish a mere mason, the nearest equivalent "stone-worker" being applied to the sculptor as well as the mason. The figure carver was chiefly a sculptor of statues, and in this sense only we have come to consider the art. One reason alleged why sculpture has declined amongst us is the development given to the plastic arts. We occupy our attention with modelling in clay before we can produce the work in marble: there are two processes instead of only one. The glyptic form of the art had to do with the geometrical lines of the building; the sculptor conceived his groups or his carving on the building from a mason's point of view, and the result was a harmonious blending of the architectonic or constructive with the sculptured forms. But, as we have said, our architecture is not dependent on sculpture; the expression of plan and structure is the great thing, and how to make our buildings tell their own story truly and simply, without a garb borrowed from other buildings. The personality of the architect is a great thing in the production, in being able to press his own imagination on his work, but it is not all—there is the great tradition of the art of construction to carry on, the experience of the past, or certain types and forms of expression sanctioned by the age.

The evil of our present position is more to be found in the disastrous divisions between the crafts, the cleavage which is separating construction from architecture, architecture from ornament, the divisions in the trades themselves, all of which are tending to narrow the views and motives of the worker, and to reduce the architect to a kind of agent in the selection and management of tradesmen. His work is now managed chiefly in the office with the assistance of clerks; he gets paid on the cost, not on the merits of his design. His drawings and designs are often delegated to others; all the accessories of architecture, sculpture, decoration, carving, &c., are often beyond his control. They are so many separate items carried out by tradesmen who perform them in a very perfunctory manner; or are separate contracts. There is, as William Morris has called it, "a trade finish" in most of our things—crockery, furniture, and architecture as well, the "homage which commerce pays to art"; the scrawl of fern-leaves and convolvulus which adorns our bedroom ewers and basins is the kind of ornament that does duty for art; it gives, as Morris says, no idea—it only gives you an impression, and a very dull one, of bedroom ware. The same philosophic art-writer speaks of the difficulties which hamper the accomplishment of good and beautiful building. "The decorative painter, the mosaicist, the window artist, the cabinet-maker, the paperhanging maker, the potter, the weaver—all these have to fight with the traditional tendency of the epoch in their attempt to produce beauty, rather than marketable finery, to put artistic finish on their work rather than trade finish." Machine-made workmanship has fostered this trade finish. The commercial builder and manufacturer finds it absolutely necessary to his success to employ machinery. What little chance there is for the real artist to be understood when so many shams are being applied to building and to all utilities; and how can real architecture be understood or appreciated when so-called art is thus produced, and the talent of the real artist and workman is being thrown away?

NATIONAL PRIZE DESIGNS.

IN our general review of the architectural and other designs at South Kensington, we noticed how few works were exhibited that displayed any merit in design, and the gold medal drawing for a Royal Mausoleum was not exceptional. The design was one submitted to the Institute for the Tite prize, but was not awarded anything. Not that it is any the worse for this fact, as the examiners at South Kensington have thought otherwise. The design as a whole is certainly heavy and inexpressive, but contains evidence of ability in the details and in the plan. We regard the work done by students in the "Personal Examinations," as they are called, of value. These are chiefly time studies, the student being restricted to a few hours and to certain conditions. The designs submitted for a house for a guild of art workers are not remarkable for any grasp of idea or design in the detail; but show a certain expertness and facility. The designs awarded "excellent" have in one or two cases a fairly good plan, containing library, class-room, lecture-room, &c. One elevation is somewhat hackneyed in style, and the gable too wide; another red brick with stone dressings has a semi-octagon porch which looks unsuitable. The drawings, however, indicate a degree of skill that is commendable, considering the limitations imposed. We notice also in Modelling Design a few essays for a wall-fountain in marble. Nos. 6233, 6677, and 6068 obtain "honours," and the first of these shows a well-conceived half-basin gracefully modelled with sea-dolphins round the bowl, and a figure over letting out the water. Other Designs have figures, tipping bowls with projecting basins set in an ornamental framework carved, as in 6878, showing a more or less suitable treatment. The design for chimneypiece in oak stained green with copper round grate, hammered into bosses, No. 50468, is effective and simple. The time sketches for an Italian Renaissance subject have not brought out much talent, though the sketches of St. Stephen, Walbrook, Skelton Church, Yorkshire, Adel Church doorway, arcading of Chapter-house, Southwell Minster, are creditable examples of sketching from memory.

We have briefly referred to the design for a ceiling by Jennie Delahunt, Manchester (silver medal), a modelled design of much merit. The ornament is flat, and in low relief—just, in fact, what a ceiling in plaster should be. The method adopted to show it by an inclined mirror is a good one. We notice also a design for a leaden cistern or head of a water-pipe by T. Claughton, for which a gold medal is awarded. The ornament is good, but too elaborate for the position of a head to a water-pipe. Some of the friezes and mirror-frame designs are decided improvements, and we endorse the examiners' remark that they are evidence of a more practical purpose to which the students' work is directed. A few of the designs for spoons which receive silver medals are by Birmingham students. Edith A. Cowell, Gertrude Haswell (a frieze design), Clara Hill's spoon designs, and those of Dorothea Ivens, &c., may be named.

We must make a few more references to wall-paper and stencilled designs. We have certainly seen better and larger number of designs for wall-papers, though those exhibited show that the designers have a better knowledge of the limitations, and how the process of paper-printing is carried out as noticed in the examiner's report. A design for a stencilled frieze by Reginald W. Bonsey, Liverpool (bronze medal), shows a design for a coving of common room in Liverpool School of Art. The subject is a series of trees in round, full foliage, and the author has cleverly managed to give the rounded masses and leafy character by the arrangement of the stencil lines. The wide range allowed by the use of the stencil for effect is well illustrated by this design, which is broad and effective in the repeat and the colour. A design for a stencilled wall-paper (bronze medal) with flowers and prickly stems, by Harry A. Wright, Bradford, hanging, and frieze, is effective and delicate. Another design, by W. Reece, Bournemouth, has a series of figures, with wings, holding festoons, and peacocks in the foreground. One of the best stencilled designs receives a gold medal, and is for the decoration of a dining-room, by Ernest H. Simpson, Leeds. The wall-filling and frieze, on a brown canvas, are designed with due reference to the stencil. Another design shows an effective square-shaped ornament as a repeat.

The book-cover designs are meritorious and refined. A silver-medal design, by Robert A. Dawson, a training student, and Kate Allen's design (silver medal) are well-conceived applications of ornament to such books as "Oceana" and "Keats." Mary G. Houston's designs for leather tooled work are excellent, and deservedly take a silver medal. Some very clever humorous designs for Christmas and other cards receive a silver medal. They are for stencilled work by Hugo W. Koch. Some are for posters, a mode of printing well adapted for broad, effective designs. We notice, also, one or two good ceiling-paper designs, one by Isabel McBean, New Cross, for which a bronze medal is given, shows invention in arrangement; another by E. Bonella, Battersea. The book illustrations show inventive talent. Frank E. Wiles, Cambridge, menu card design (silver medal) is graceful and decorative; and Sunderland Rollinson's (Scarborough) shows in his usual clever and felicitious manner some very effective landscape studies. A bronze medal is also awarded to Janet Simpson, Lambeth, for some clever drawings for illustrations and cards. Edith A. Cubitt, New Cross, draws some delightful children in a wood, illustrating "The Seasons" (bronze medal); and Agnes Hilton has a clever Christmas-card design.

The designs for interior decoration are few. The gold medal, awarded to William J. Medcalf, Liverpool, for a design for a frieze of a hall, is well arranged and rich in colour. The subject is full of figures. A silver medal is also awarded to a design for decoration of a music-room; but the scheme of green colour is rather heavy, and the door is over-panelled. The decoration is proposed to be carried out in faïence, but the examiners entertain doubts about the manner of jointing proposed. The spandrels over entrance to vestibule are filled with peacocks, arranged in a pleasing, decorative manner. Edith J. Pickett's design for decoration of entrance to hall, which takes a bronze medal, is in incised and coloured plaster, and the lunette and door panels in leaded glass. The vine and cluster of grapes decoration in spandrel is rather redundant.

Referring here in more detail to a few of the architectural designs, we notice the imperfect lighting to vestibule in John Houston's design for a concert hall, unless by some means not shown. In the design for village church on a hill-slope, by Harry Phibbs, the bays at side are narrow, and the plan shows deep outer splays to windows—a feature we also notice in another design for the same subject. The tower at the end is the best feature. The design receives a bronze medal. A simply treated cruciform design, by Chas. Gascoigne, Nottingham, is awarded a book prize. A simply treated design for a village church, with a red tile, pointed cupola-shaped termination over the side tower, by Ernest A. W. Moore, Birmingham, may be noticed. The designs for stained glass are few, and of little merit, the students showing not much knowledge of the process. Agnes Hilton, Birmingham, has rather a clever figure design in chalk. The figures of girl and children, with horse entering stable, are well drawn. It takes a bronze medal. The design for a bachelor's room, and ingle in plain oak, briefly referred to last week, by George M. Ellwood, Holloway, is quaint in the treatment, and the drawing is clever. It receives a silver medal.

The Gold Medal has been awarded to Harry G. Theaker for designs for a pianoforte in tempera and gold. The design is characteristic of the purpose. A design for a frieze of eight panels in gesso, by Dorothy Smyth, Glasgow, is cleverly treated, but only receives a book prize. One figure worked in gesso on canvas to a large scale shows the figure of a primitive warrior, in admirable tones of colour. The modelled designs in low relief for brush and mirror backs, which receive a gold medal, and the modelled designs for glazed tiles, awarded a silver medal, are meritorious, and indicate a suitable treatment of material.

For ironwork, one of the best designs is by George E. Kruger, Bath, for a wrought-iron gate, &c. The bars are chiefly upright, and the ornamental parts confined to a row of simply forged heads, very effective and reserved. It is given a silver medal. The design contrasts rather strongly with another beside it, where the horizontal bars or rails predominate, and cut up the design.

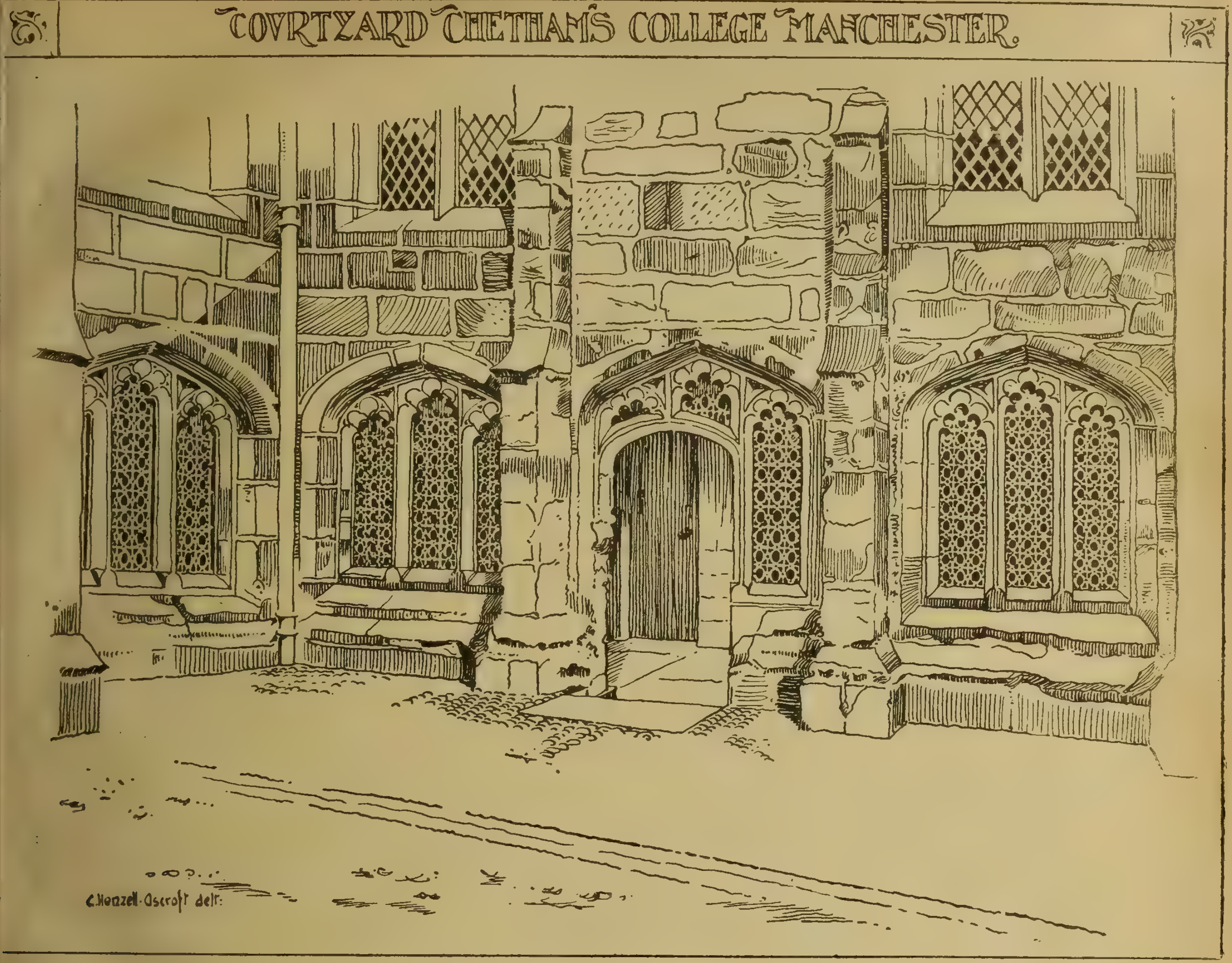
The architectural drawings from measurement are not many or remarkable in the choice of subjects, and the quality is below the average. Neat and highly-finished draughtmanship is still the order of the day in the art schools, and sometimes there is a too mechanical neatness and spiritless effect.

Very careful and finely executed are the drawings of Peterborough Cathedral west front, by Ernest Turner, with details of spire, western porch, and plans of front. Kirby Hall, tinted sepia elevations and details, are equally painstaking and careful, by the same author, and worthily take the silver medal. We notice also the neatly executed drawings of south transept doorway of Beverley Minster, a fine specimen of Transitional Early English (a bronze medal); and a carefully executed set of the same by a Hull student. A very able and firmly-drawn set of measured drawings receive only a book prize, and illustrate the Abbey Church of St. Merin, Paisley. The beautiful Late Decorated window is well drawn; also the Early English west doorway, with its plan of jamb and arch moulds. This work at least should have been awarded a bronze medal. We can hardly understand the principle of the awards in some cases; but here the drawing shows artistic sense and touch, and the jointing is well given. The student's name is Andrew Rollo, Glasgow. The drawings of the same abbey church, Paisley, show the interesting cruciform plan, with long choir inclined south, and a short nave and aisles. A book prize is given to the student, James Smith, of Glasgow. There are also drawings of Tutbury Church (book prize); Prince Arthur Chapel, Worcester, very neatly drawn by Albert Pitcher; west elevation of King Sutton Church, Northants, and details of tower and spire (bronze medal); wrought-iron screen at All Saints', Derby; drawing of chimney-piece, Florence (bronze medal), panelling of a room, Exeter, neatly drawn (silver medal), sketches of tower, Winchester, by Gotch (book prize), and a set of rather coarse drawings showing the decoration of staircase ceiling and wall in Belvidere House and Leinster House, Dublin (dated 1775), interesting examples of refined stucco ornamentation with arabesque panels and medallions, by William L. Whelan, Dublin (bronze medal awarded). The examiners justly call attention to the waste of time involved in repeating ornaments such as the dog-tooth ornament throughout, and the unnecesssary number of lines in drawing mouldings in elevation—advice which ought to be followed.

The applied designs based on plants and flowers, such as Nos. 296, 998, 586, are fairly good. We have no space to refer to other branches, such as modelling ornament, painting ornament from casts, drawings from the antique, oil-painting and water-colours. The progress in some of these departments is not satisfactory; the examiners are disappointed with the drawing of heads from the antique, drawings of details from the living model are not equal to those of previous years, and the modelling from the human figure, drapery, &c., is not very high, though in other respects, as in modelling the figure from life, the average is higher. The suggestions for design from natural objects, such as bird form (see No. 113), are useful exercises. One or two of the painted heads from life, as Nos. 1001, 646, 874, &c., and the water-colour subjects, Nos. 35785, 740, are meritorious.

DINNER TO MR. THOMAS BLASHILL.

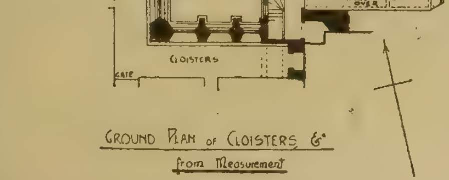
THE District Surveyors' Association gave a dinner to Mr. T. Blashill, on the 26th of July, when a suitable testimonial was presented in the form of an address with an illuminated border, and the signatures of all the district surveyors, with one or two exceptions. After a specially-selected menu had received attention and the loyal toast, the President, Mr. Horace


COVRTYARD CHETHAM'S COLLEGE MANCHESTER.
C. Henzell-Ascroft delt.

Gundry, in an eloquent speech, proposed the health of Mr. T. Blashill, and wished him many years of well-earned retirement. Mr. Blashill responded, and expressed his thanks for the kindly feelings expressed by his former colleagues. Mr. H. H. Collins proposed the health of Mr. W. E. Riley (Mr. Blashill's successor), and he responded. Mr. Payne, hon. treasurer, proposed the health of Mr. Fredk. Wallen, hon. secretary, and, at the conclusion of his speech, the President presented Mr. Wallen with a massive silver salver, which had been subscribed for by the members individually, as some acknowledgment of the services rendered by Mr. Wallen in connection with the London Government Bill. Mr. Blashill proposed the toast of "The District Surveyors' Association," and the President responded. Mr. Collins proposed the health of Mr. Payne (hon. treasurer), Mr. B. Dicksee for his services on the Parliamentary Committee, and Mr. H. Lovegrove for making arrangements for the dinner, &c. The members present were: Messrs. H. Gundry (president), B. Tabberer (vice-president), A. Payne (hon. treasurer), F. Wallen (hon. sec.), Professor Aitchison, A.R.A., Professor Roger Smith, Messrs. W. Hardcastle, A. Williams, E. Street, R. P. Netley, C. Foulsham, Ellis Marsland, W. Spiers, F. Clarkson, T. Mundy, H. H. Collins, E. Woodthorpe, W. Grellier, H. McLachlan, E. Carritt, Hewson Lees, J. Goodchild, H. Lovegrove, F. Hammond, G. McDonell, Barnes Williams, B. Dicksee, H. Stock, H. Gundry, H. Cheston, G. Elkington, T. Batterbury, J. Clarkson, A. Tanner, D. Mathews, H. Watson, C. F. Hayward, Arthur Ashbridge, E. R. Hewitt, J. Tolley, R. Dale, A. Conder, and F. W. Hamilton. The only guests were Messrs. Blashill and Riley. Mr. S. Gandy and Mr. F. W. Holloway gave vocal and instrumental music, and Mr. Harry Tipper gave excellent pieces on his handbells. The dinner took place in the Gordon Room of the Holborn Restaurant, under the direction of Mr. T. J. Hamp, the manager.

CHETHAM COLLEGE, MANCHESTER.*

THE Chetham College is one of the very few antiquities which Manchester possesses. The College, or Hospital, was used as a dwelling by the collegiate body from 1428 until the year 1547, when it fell into the possession of the Earl of Derby. About 100 years afterwards it was purchased by the feoffees of the Chetham Charity, incorporated by Royal Charter, and occupied by poor boys from 1656 to the present time. The two sketches are opposite views in the cloister court. C. Henzell Ascroft.



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On Monday afternoon the foundation-stone of a new drill-hall at Carter's Green, West Bromwich, was laid. It is estimated to cost about £2,000.

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* Further illustrations of this building will be found in the Building News for Nov. 15, 1889, and Dec., 1893.

RAILWAY VIADUCTS IN DEVON AND CORNWALL.

THIS was the subject of a paper read by the Secretary of the Conference of the Institution of Mechanical Engineers, at Plymouth last week, on behalf of Mr. T. H. Gibbons, divisional engineer, Great Western Railway, Plymouth.

He said: The course followed by the railway from Plymouth to Truro, opened in 1859, and extended to Falmouth in 1863, traverses many cross valleys of depth too great to be economically filled up by embankments. Excluding the Royal Albert Bridge at Saltash, forty-two viaducts were placed on the sixty-five miles between Plymouth and Falmouth, and ten viaducts on the twenty-six miles between Truro and Penzance. The aggregate length of the forty-two viaducts was 4·8 miles, and of the ten viaducts 1·03 mile. Without going too closely into the details of construction, which would be out of place in the general description called for on this occasion, all the above-numbered viaducts may be placed under one of two classes, A or B. Those in class A depend upon timber trusses to carry the decking and the railway, and these trusses are supported for the most part on timber piles, which form the piers. This kind of construction is to be found between Devonport and St. Germans, where the railway has to cross tidal creeks, in which are deposits of mud of depths up to 70ft. Hence followed the adoption of timber piles for foundations, carrying timber piers and trusses. Forty feet is the usual span for this class of viaduct, and the heights range between forty and a hundred feet. In this type of construction the changing of the timbers in any part of the main trusses involves the breaking up of the truss, which has to be cast adrift for the time, temporary support being provided to carry the decking on one side; this occupies so much time that the renewal of the principal parts of the trusses can only be done on a Sunday, when an interval of several hours between trains be obtained. In Class B may be included the large majority of viaducts over valleys where good foundations are to be had. The general plan is to have masonry piers built from 60ft. to 66ft. apart, and carried up to sill level, which is about 35ft. below level of rails. From the top of these piers three sets of struts radiate, four struts in each set, making 12 struts on each pier; these struts are kept in place by horizontal walings and diagonal braces of timber, and on the top of the struts are the main carrying beams in three runs for the single line; the beams are double, and the top and bottom beams are united together by raking bolts, joggles, and keys. The top width of the viaduct is from 15ft. to 16½ft., according to the construction of the parapets.

When the work now going on is finished there will remain only one timber viaduct between Truro and Penzance—namely, the low one that crosses the beach a quarter of a mile before reaching Penzance Station. Between Plymouth and Falmouth, speaking broadly, two thirds of the work of reconstruction have already been done, and the work is still busily in hand. The first step towards reconstructing viaducts in Cornwall was taken in the year 1869, when the Probus Viaduct, 145 yards long and 43ft. high, was replaced by an embankment, and the centre line of railway was improved at the same time. Between the years 1873 and 1886 the viaducts in the Glynn Valley between Doublebois and Bodmin Road Stations, eight in number, and those near Liskeard, three in number, were dealt with. Following the amalgamation of the Cornwall with the Great Western Railway Company, the narrowing of gauge works ensued in 1892, and soon afterwards the work of viaduct reconstruc- in Cornwall, in connection with the doubling of certain sections of the lihe, was undertaken on a large scale. The general lines of the earlier reconstruction were not changed—that is to say, where the height of the old viaducts and the piers admitted it, new steel superstructures were erected on the original piers, which were raised for the purpose. Examples of this are to be seen at Liskeard Viaduct, close to the station, and at Coldrenick Viaduct, close to Menheniot Station. At Keyham Viaduct, near Devonport Station, the process of reconstructing in steel on the old piers raised is now in progress. Here it has been necessary to widen some of the piers from the foundations; in the former instances the new masonry or brickwork begins at about 35ft. below level of rails. The form of the old piers at Keyham is not so suitable as in those at Liskeard and elsewhere. In all these viaducts erected on same site as that of the running lines, the girderwork is provided by contract, but all the rest is done by the company's staff. The foundation generally obtained throughout the series has been shale rock, the beds being inclined at various angles, between the horizontal and vertical; and no single case of settlement due to failure in a foundation to carry its load has arisen from the beginning of the reconstruction work up to the present time. From 10ft. to 15ft. of excavation has generally sufficed to reach the rock; in a few cases the depth has been twice as great. Timber centring has been used, several viaducts in succession being served by the same centres. American yellow pine is the timber used generally in the Cornwall viaducts, and the preserving process is that known as kyanising. This process has been found to render the timber not liable to catch fire easily, and this is a very necessary qualification in preparing timber for such purpose and situation.

LONDON COUNTY COUNCIL.

THE weekly meeting of the Council for the Administrative County of London was held on Tuesday afternoon at the County Hall, Spring-gardens, the chairman, Lord Welby, presiding.

THE HOUSING QUESTION.

The Finance Committee were authorised to take the necessary steps to wait by deputation upon the Chancellor of the Exchequer, to ascertain the views of the Treasury on the following proposals:—(1) The extension of the sinking fund period for capital money raised for the erection of working-class dwellings; (2) the power to reckon the land on which the dwellings are erected as an asset against debt.

SANITARY CONDITION OF ST. PANCRAS.

The Public Health Committee submitted a report with reference to the sanitary condition and administration of the parish of St. Pancras. The insanitary conditions prevailing in the parish have been the subject of representations to the Council from several bodies. The report of the Council's medical officer (Dr. Hamer) pointed to the unfavourable position of the parish with respect to the number of dirty, dilapidated, and overcrowded houses. Dr. Hamer found in St. Pancras, as elsewhere, that houses in which dirty and dilapidated conditions and overcrowding especially existed occurred in groups, and were evidently associated with particular ownership. He recommended that seven additional sanitary inspectors, with the necessary clerical staff, should be appointed. The committee think the failure to maintain proper sanitary conditions in the parish should be attributed, not to any default on the part of the medical officer of health and inspectors, but to the insufficiency of the sanitary staff. They feel so strongly that the increase the St. Pancras Vestry propose is inadequate that they think the Council should make a representation to the Local Government Board in the matter, and made a recommendation to the Council to that effect.

Mr. N. Robinson moved that the recommendation should be referred back to the committee for further consideration and report. He spoke of the great difficulty experienced by the St. Pancras Vestry in dealing with the overcrowding in their district, and stated that they were taking steps for the registration of the houses, and had appointed two additional sanitary inspectors, who would make a house-to-house visitation.

Mr. Purchese seconded the amendment, and said the condition of St. Pancras was not so black as it had been painted. For some of the overcrowding in the district the Council itself was to blame, through their delay in building on the Churchway area. If a Local Government Board inquiry were held it would paralyse the Health department in the district for the next three months.

Mr. Westacott supported the amendment.

Lord Carrington referred to the many difficulties which beset the path of those anxious to grapple with the housing of the poor in London. He thought it would be well that the Council should give the St. Pancras Vestry a little time in order that it might put its house in order. He did not believe in too much interference by the Council with the local authorities.

After further discussion the debate was, on the motion of Dr. Collins, adjourned.

CHEYNE-WALK, CHELSEA.

On the recommendation of the Improvements Committee, it was agreed to contribute £4,400 towards the cost of widening Cheyne-walk, Chelsea, west of Battersea Bridge, at a spot known as Lindsey-wharf. The work is to be carried out by the Chelsea Vestry.

THE WATER QUESTION.

A discussion took place upon the report of the Water Committee with reference to the present condition of the river Thames and Lea.

Mr. Beachcroft characterised the report as a very humiliating document. The Council had opposed all sorts of Bills, and now the Water Committee came to the Council and asked that a letter should be sent to the Local Government Board suggesting latitude for the water companies. He could not find any anxiety on the part of the public as to the water supply, although there was apparently a good deal of anxiety by Mr. Dickinson and the members of the Water Committee. He hoped to hear what the Local Government Board had done in reply to the committee's communication.

Mr. McDougall said that if, as Mr. Beachcroft had said, there was no anxiety among the people of London as to the water supply, he could safely say that there was anxiety at the Thames Conservancy Board. The excess of water taken per day by the water companies above their statutory rights was 27,000,000gal. The last quantity reported as coming over the weir at Teddington was 94,000,000gal. On the previous day it was reported that there were 100,000,000, but he had learned, in conversation, that the water at the back of the weir was 3in. below the level. The Thames Conservancy had considered that day whether they should write to the water companies suggesting care by consumers, but they had decided to do nothing to embarrass the companies.

Mr. Dickinson said they had received no reply from the Local Government Board. He hardly believed there would be a water famine during the recess. The volume left in the river at Teddington Weir was less than 100,000,000gal. If that went on, they would soon run the river dry. But they could hardly expect August and September this year to be as dry as they were last year. No report had misled the public so much as that of Lord Balfour's Commission.

The report was then adopted.

VAUXHALL BRIDGE.

The Bridges Committee asked the Council to sanction the expenditure of £40,000 beyond the estimate of £74,000 for the acquisition of property required in connection with the rebuilding of Vauxhall Bridge. The committee explained that the excess had occurred chiefly on account of the excessive verdicts given on the claims of the Clothworkers' Company and Messrs. Francis and Co. These verdicts amounted to £46,786, the Council's valuation being £33,000. The cost of reinstating some warehouses on very expensive sites was responsible for the rest of the excess.

After protests from Mr. Balian and others, the excess was sanctioned.

Other business was transacted, and the Council adjourned for the summer recess, until Tuesday, October 10.

NATURAL VENTILATION.—I.

By Robert Boyle.

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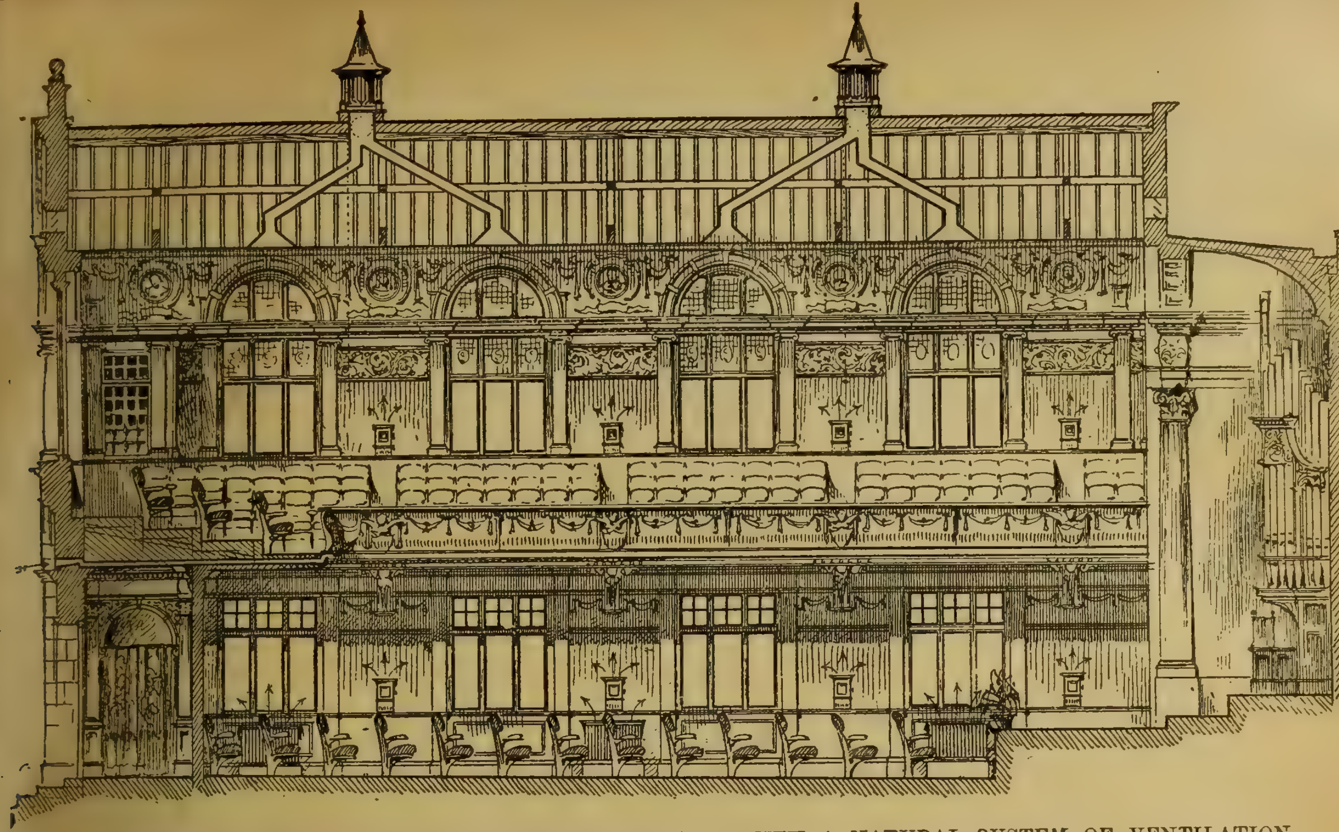
THERE is, perhaps, no other subject with respect to which there is a greater diversity of opinion than that of ventilation. Ventilation is the most difficult of all sciences to practically deal with so as to satisfy everyone. Indeed, to do so is well-nigh impossible, owing to the varying idiosyncrasies and temperaments of different individuals. It will, however, be admitted that the method which secures the requisite change of air in the simplest and least objectionable manner is the one most likely to prove generally acceptable.

That that method is the natural one when properly applied is conceded by the highest authorities on the subject. It possesses the advantage of being easily installed at a moderate cost, and, requiring no special attention, it can never get out of order or break down, as so often happens with artificial ventilation. It is also admitted that the proper place from whence to extract the warm expired air is at the ceiling or upper part of a building, to where it naturally ascends. Dr. Parkes, than whom there is no higher authority, says, "As the ascent of respired air is rapid, on account not only of its temperature, but from the force with which it is propelled upwards, the point of discharge should be above. By some it has been argued that it is better that the foul air should pass off below the level of the person, so that the products of respiration may be immediately drawn below the mouth, and be replaced by descending pure air. But the resistance to be overcome in drawing down the hot air of respiration is so great that there is a considerable waste of power, and the obstacle to the discharge is sometimes sufficient, if the extracting power be at all lessened, to reverse the movement. This plan, in fact, must be considered a mistake. The true principle is that stated long ago by D'Arcet: 'in the cases of vapours or gases the proper place of discharge is above.' Three forces act in natural ventilation—viz., diffusion, wind, and the difference in weight of masses of air of unequal temperature. In temperate climates, in most cases natural ventilation is the best. Incessant movement of the air is a law of nature. We have only to allow the air in our cities and dwellings to take share in this constant change, and ventilation will go on uninterruptedly without our care."

Atmospheric air per 1,000 volumes is composed of oxygen 209·6, nitrogen 790·0, carbonic acid 0·4. Expired air contains about 5 per cent. less of oxygen and a little more than 4 per cent. more of carbonic acid than that which is inhaled. From 25oz. to 40oz. of water is passed off from the lungs and skin in 24 hours.

Carbonic acid gas is not in itself poisonous, but as a product of respiration, particularly in connection with an excess of moisture, its presence is always an index of contamination of the air by other impurities, such as organic matter, and it is therefore employed as a standard to determine the vitiation. Carbonic acid diffuses in the air, and does not gravitate to the lower



LONGITUDINAL SECTION OF A PUBLIC HALL FITTED WITH A NATURAL SYSTEM OF VENTILATION.

levels. One cubic foot of gas consumes the oxygen of about 8c.ft. of air, and produces 2c.ft. of carbon dioxide.

The average number of respirations made by an adult is 20 per minute, 30c.in. of air being inhaled at each respiration, or 600c.in. per minute, or about 20c.ft. per hour. With a temperature of 70° Fahr. the temperature of the air expelled from the lungs is from 85° to 95° Fahr. It is the organic matter suspended in the watery vapour expelled from the lungs and exhaled from the body wherein the real danger lies. As this vapour is in a heated state and immediately ascends, it should be drawn off at the highest point, and not permitted to return to be rebreathed, as happens with downward ventilation by propulsion. With downward ventilation, from three to four times the volume of air is required that is necessary with upward ventilation, the cost being proportionately increased.

Ventilation by dilution necessitates the supply of a very large volume of air to keep the air in a building in anything like a healthy state. When the ventilation is by extraction, the vitiated air is removed as fast as it is generated, and healthy ventilation is secured with but a fraction of the volume of air required for dilution by propulsion.

One of the greatest dangers to health is where the fresh air supply is raised to a temperature such as is required to effectively heat a building, as it is thereby seriously deteriorated and rendered unfit for healthy breathing purposes. The heating of a building should always be kept separate and distinct from that of the ventilation. Radiant heat is the healthiest.

The velocity of the air supply should never be greater than 2ft. per second if draughts are to be avoided. The fresh air should be admitted at about breathing level in an upward direction through a number of small tubes distributed round the room to secure more perfect diffusion. Where the air is warmed by passing through radiators a lower level is permissible.

With the many diverse methods of ventilation at present in use there can be no fixed standard for determining the volume of air necessary to secure effective ventilation, one system insuring with a given volume a healthy atmosphere, to secure which with another system several times that amount may be required.

At a time when the science of ventilation and the natural laws which govern it were but imperfectly understood, it was held by many, and still is by some, that a very large volume of air was necessary to dilute the vitiated air in a building to a healthy standard, from 2,000c.ft. to 6,000c.ft. per hour per person being recommended. Experience and a more enlightened knowledge of the subject have, however, taught us that with the more perfect forms of ventilation by extraction from the upper parts of a building, to where the warm expired air naturally ascends, considerably less than the least of these estimates is sufficient for all ordinary requirements. A high authority fixes 100c.ft. per hour per person as quite sufficient with this method of ventilation, as the average of 20c.ft. of air, which is respired by an adult per hour is expelled from the lungs at a temperature of 80° to 100° Fahr. and ascends, along with the heated exhalations, from the body to the upper parts of the building, and is then at once drawn off, so that no part of the vitiated air can be returned to be rebreathed, as is the case when the ventilation is effected by dilution on the downward principle.

As, with effective upward ventilation, the ascending vitiated air is drawn off as fast as it is generated, an equivalent supply of fresh air being admitted at or below breathing level, it is obvious that a considerably less volume of air would be required with this method to secure efficient ventilation than where the foul air is merely "diluted" to a given standard, as is the case with all forced systems of ventilation, necessitating the introduction of large volumes of air.

Professor R. H. Smith says: "The commonly adopted basis of calculation of so many cubic feet of space in each room per person meant that the object aimed at was the slowing down to a standard time-rate of the vitiation of a stationary quantity of air. From this idea was derived that of supplying per hour between 30 and 200 times as much air as was actually inhaled by the inmates of the room. The true idea of perfect ventilation is evidently to inject and extract only a moderate excess—say, five to ten times as much over that actually used—and to do so in such a manner that (1) the exhalations do not mix with the fresh-air supply; and (2) the inflow is properly diffused, and does not pass direct to the outlets in merely local currents or draughts.

"In order to keep down the percentage of pollution to a non-dangerous degree, under the downward system arises, therefore, the necessity of admitting for ventilation fresh air in quantities many times greater than that actually used, and also a correspondingly extravagant expenditure of heat if this supply be artificially warmed. Thus the only ideally perfect ventilation consists in inducing a regular up-current from a level below that of the human head up to the extraction outlets at the ceiling. Under this system the bulk of fresh air required to be admitted is immensely reduced, as is also the expense of warming it to any degree considered desirable."

(To be continued.)

THE NEWCASTLE-ON-TYNE INFIRMARY.

On Saturday last, the new infirmary committee ended their labours of selecting from among the competitive designs sent in, and decided with unanimity upon one of the designs. The committee had the assistance of Mr. Alfred Waterhouse, who acted as assessor. Some time ago, when it resolved to go forward with the work as early as possible, 23 architects in Newcastle and elsewhere were invited to compete. Eighteen accepted the invitation, six afterwards withdrew, while four did not send in plans, thus reducing the actual number of competitors to eight, a small number, certainly; but the difficulties of the site probably deterred some from competing.

THE AWARD.

The adjudication of the committee on the plans resulted as follows:—(1) Messrs. H. Percy Adams, London, and Wm. Lister Newcombe, Newcastle, who are in this matter acting conjointly. These gentlemen secure the building of the new infirmary. (2) Messrs. Simpson and Milner Allen, London. Prize £150. (3) Messrs. Gibson and Pite, London. Prize £100. (4) Mr. W. Henman, Birmingham. Prize £50.

The selected architects have had the benefit of large experience in hospital construction. Both of them have previously acted conjointly as architects for the new workhouse infirmary at Ipswich. Mr. Adams holds the appointment of architect to several of the London hospitals, and the Bedford Hospital is from his designs. The Hartlepool hospital was reconstructed from Mr. Newcombe's plans, and he has designed several infirmaries in connection with the Local Government Board.

DESCRIPTION OF THE SELECTED DESIGN.

The buildings have been arranged so as to obtain a maximum amount of air space between the various blocks of buildings, and to obtain the very best possible aspect for each department. The ward partitions are only two floors high, and so placed that the medical wards are on the first floor and the surgical wards on the ground floor. The only wards not on either the ground or first floor are four four-bed wards for surgical cases, which are placed on the lower ground floor (well above the ground), and these wards would be for separation cases. The nurses' home is placed at the highest level of the site, facing the entrance to the Leazes Park. The laundry is placed at the lowest level of the site. The post-mortem room and mortuary are placed away from the wards, and yet convenient to the staff.

The administrative department is designed in the centre of the several groups of buildings. It will be easily accessible, and will be entered through a porch of sufficient size to permit a carriage to stand under cover. Passing through the vestibule to the main hall, corridors branch right and left. The main entrance hall will be directly overlooked from the room for porters, and it will be also within a very short distance of the rooms to be appropriated to the officers. Off the hall and porters' room will be the telephone and telegraph room. Immediately on the right of the central entrance will be a sitting-room for the assistant house surgeon. Next to this will be the room for the staff, and at the end of the corridor will be placed a large library. Immediately contiguous to the library is a staircase shut off by a door from the administrative corridor. This staircase will communicate with the students' department, and will provide easy access to the library.

The medical and surgical offices will be concentrated in this half of the administrative block, and west of the reception-department. Opening off the hall and corridor on the left, there will be provision for visitors, secretary, and clerks, as well as three rooms for the house governor, room for lady students, &c., while at the west end of the corridor will be an office for the lady superintendent, bedroom, and other departments. The service wing will be placed centrally between the main corridor of the infirmary and the administrative block. The main administrative staircase is arranged around the central hall, and immediately in front of this, in the centre of the main elevation, the board room is situated, with a balcony over the door. Upon this floor will be arranged the senior house physician's rooms, sitting-room, bedrooms for house physicians and surgeons as well as other apartments. Opening off the west end of the corridor will be the dining-hall for the resident officers. In the service of this floor will be two dining-halls—one for sisters and staff nurses, and the other for nurses and probationers.

SECOND FLOOR OF ADMINISTRATIVE BLOCK.

The kitchen department is arranged on the second floor of the service wing, and will comprise a large kitchen, scullery, preparation-room, store-room, carving-room, pastry-room, and other apartments.

NURSES' HOME.

This block has been arranged at the extreme west end of the infirmary main corridor, and at its juncture with the home will be a cloak-room and other apartments near to the main entrance. There are three staircases—one central and one at each end of the building in the best position for access to the rooms. On the ground floor there will be eight bedrooms for nurses, on the first floor 26, on the second floor 26, and on the third floor 20—a total of 80, as well as six bedrooms for housemaids.

The chapel has been arranged to the north of the main infirmary corridor, and west of the central ward staircase, and comprises a nave, side aisle, small chancel, and organ-chamber, as well as a room for robing. The accommodation is for 142.

The out-patients' department will be close to St. Thomas's-street, and will be accessible to patients directly they enter the hospital grounds. The plan has been so arranged that the persons entering will follow a definite route. The sexes, and also the surgical and medical cases, can be separated, and the whole will be under the superintendence of the attendant. There will be four large consulting rooms and four small ones. The operation room has been placed so as to be convenient for all the consulting rooms, but especially those on the surgical side. The ophthalmic room will have an uninterrupted range of 24ft., and will be fitted with a dark closet for the use of the ophthalmoscope.

The dispensary will be well lighted and fitted with dispensing counters for male and female patients, and also a serving counter for house medicines.

The accident and reception rooms have been arranged in such a position that they will be easily accessible by carriage from the public road. They are entirely away from the public gaze, they are on a level with the outside, also on a level with the ground floor (which is the surgical floor), and therefore on the same level as the operating theatre. This department can be reached by the patients and public without going through the main administrative building. It is also in communication with the wards, without the necessity of passing through the administrative building.

There will be eight ward pavilions. It has been the endeavour of the architects to plan all surgical wards on the ground floor and the medical wards on the first floor. The ward pavilions will be generally two stories only in height; but the fall in the site has been utilised in the easternmost wards to obtain accommodation for four of the surgical four-bed wards. These wards will be placed on the lower ground floor, and will be used for isolation cases. The ward pavilions are not less than 80ft. apart, and as they are only two stories high and placed axially almost due north to south, the architects claim that by that arrangement they will secure a maximum amount of light and air. There will be a staircase, 5ft. wide, centrally placed between every two wards, and inclosing a passage lift capable of carrying a recumbent patient with attendants. The architects suggest that the lifts should be worked by hydraulic power. The large ward pavilions will all be very similar, and are designed for twenty-four beds each. With regard to ventilation, the architects say that no artificial system could be so easily and completely controlled by the nurses as the simple one of opening and closing the opposite windows; and all mechanical contrivances are apt, they say, to get out of order, in which case the results would be disastrous. The architects have had large experience of the propelled fresh-air system instituted in a large recent hospital, and the results, they report, have not been entirely satisfactory. The question, however, of the system of ventilation will probably be freely discussed at a later date by the committee, the staff, and the architects. The walls of the wards it is proposed to line with glazed bricks to a height of 5ft., and then it is suggested that the walls and ceilings be finished with cement, covered with enamel paint. At the end of each ward will be cross-ventilated lobbies. Each ward will be 102ft. long, 27ft. wide, 13ft. high, and will contain 24 beds. Each ward will contain 35,802c.ft. of space, or 1,492c.ft. per bed. The window area will be 1sq.ft. to every 64ft. of cubic air space. The children's wards will be only 24ft. wide instead of 27ft. The main object kept in view in planning the smaller wards has been the efficient attendance on the largest possible number of patients by a given number of nurses, and they will be so arranged that one sister and her assistant will be able to attend to approximately 24 patients. Two rooms for photography have been placed on the ground floor, near the operating theatre, and this is where the X-rays will be chiefly used.

The operating theatre will be placed on the ground-floor level. The architects have digressed somewhat from the general form of operating theatres. They have given the matter their closest study, and have studied the principal operating theatres in Europe. It is, they say, confessed by leading surgeons that in the ordinary form of theatre the majority of the students can see little, if anything, of the operations, and to remedy this defect it is suggested placing a gallery nearly all round the theatre, the gallery being only 7ft. from the floor of the theatre. Under the operating theatre, accessible from the basement corridor, and easily accessible from the students' rooms, will be the lecture theatre, with seating accommodation for rather more than 100 students. The laundry will be placed at the northern end of the pavilions.

The entire building will be lighted by electricity, and the current for the purpose will be obtained from the public supply. The heating will be effected, partly by the use of the open fireplace, and partly by hot-water apparatus. The various lifts throughout the hospital will be actuated by hydraulic pressure.

The elevations have been designed with little ornament, and that chiefly concentrated on the administrative buildings, proportion being relied on rather than ornament for effect. It is suggested to execute the whole of the facings with red dressed bricks and stone dressings. The roofs will be covered with green Westmoreland slate. Internally, the principal joinery they suggest should be executed in Columbia pine, slightly stained and varnished, other work to be in good deal.

SUMMARY OF APPROXIMATE COST.

The following is the architect's summary of the approximate cost:—

Administrative block	£27,209	8	6
Pavilions, including main connecting corridor	77,067	9	4
Nurses' Home and covered way to the same	10.000	0	0
Out-patients' department	6 328	7	4
Chapel	2,294	11	1
Large operating theatre and lecture theatre below	3,853	0	0
Operating theatre next children's ward	1,301	0	0
Operating theatre next chapel	835	16	0
Mortuary and post mortem-room	1.623	19	5
Laundry, and extra for chimney	3,110	5	6
Shops and shed	586	11	4
Lodge	585	9	0
Boundary walls, railings, gates, and piers	2.971	0	0
Drainage	4,000	0	0
Heating and hot-water service	4,500	0	0
Hydrants	500	0	0
Laundry fittings	750	0	0
Kitchen fittings	1,000	0	0
Lighting	1,200	0	0
Disinfector	150	0	0
Total	£149,834	17	6

In order to meet, if necessary, the conditions of the will of the late Mr. John Hall, the architects submitted another estimate for a less expensive institution, amounting to £100,040 13s. 5d.

The area of the new building will be 107,886 superficial feet, of which 15,921 will be taken up by the administrative block.

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THE YORKSHIRE LOCK-OUT.

UPON the successful settlement of the Plasterers' dispute, overtures were made by members of the National Association of Master Builders' Association to the editor of the *Daily News*, to see if he could use his good offices to secure a peaceful solution of the general dispute of the building trades in Yorkshire. This dispute had already been in existence for several months in certain parts of Yorkshire. Thus, in Hull, wage troubles subsisted between the carpenters and bricklayers, and other employers. In addition to this the Hull employers had issued "a proposed code of working rules," which the men declared they could not possibly accept. In May the area of dispute was considerably extended, the whole of the federated employers in Yorkshire locking out 25 per cent. of their men. It was estimated that about 15,000 men were directly affected.

The editor of the *Daily News*, having consented to the request of the Master Builders, at once put himself in communication with the Yorkshire employers and the representatives of the Committee of Trades. As a result, he was enabled to submit to both sides, at a conference in Derby, on June 5, the following suggested basis of settlement:—

Suggested Basis of Conference.

With regard to the points raised by the Northern employers:—

1. The alleged coercion of foremen into the Unions.

The Unions will agree that no steps shall be taken in future to compel foremen to join the Unions.

2. The alleged refusal of the Union men to work with non-union men.

It is agreed that in future no prejudice shall be shown either by the employers or by the men by reason of a man belonging or not belonging to a trade union. It is understood that the men the Unionists object to work with are defaulters, and other men who have been shown to the employers to have made themselves specially objectionable to the Union men. Should any dispute arise, the matter will fall under clause 6 below.

3. With regard to the demarcation of work.

It is agreed that joint committees shall be established in the different districts equally representative of the employers and the mechanics, whose representation shall be equally divided amongst the different branches of the trade in question. These committees shall, so far and as soon as is possible, draw up schedules of the work which it is recognised belong to certain branches of the trade. To such committees shall be immediately referred all points of dispute as to demarcation, and the decision of the majority in each case shall be accepted as binding on both sides. Should they fail, however, to decide, then the matter shall be referred for settlement to similarly constituted joint committee representative of the National Association of Master Builders and the other societies affected, whose decision shall be final. Pending such reference to the local committees, no strike or lock-out shall take place; but the decision of the employer shall be provisionally accepted as to who shall do the work.

Provided that preference shall be given to that branch of the trade which in practice has done the work before in that district and provided no preference be given on on account of the payment of lower wages.

4. With regard to the fixing of materials worked or partially worked in another district.

It is agreed that the men shall in future make no objection to do this, and that there shall be no boycotting or blacklisting where the firms adhere to the rules mutually agreed upon; the employers agreeing on the other hand that such rules shall be strictly enforced in all parts of their contracts.

5. With regard to apprentices.

I would suggest that as different practices prevail in different trades represented at this Conference, the question shall be left quite open for the decision of the Conference.

6. With regard to the avoidance of disputes in future.

In the event of a dispute arising on any job or works the district officials of the Union affected shall send written notice to the local Association of Master Builders, who shall inform them whether the said builder is a member of that body. If so, a strike shall not be sanctioned by the Union until six clear working days have expired from the receipt of such notice, during which time the matter shall be considered by a Joint Committee consisting of six employers and six representatives of the workmen, with a view to an amicable settlement. Failing a local settlement, reference shall immediately be made to a Central Joint Committee of the two Associations, and until five days have expired from the date of this reference, no strike or lockout shall be sanctioned either by the Unions or by the National Association of Master Builders.

7. I would further suggest that in future for the purpose of any alterations in rules or rates of wages are agreed upon, notice be given on either side, the length of such notice and the date or dates of expiration to be left to the decision of the Conference.

8. I would also suggest that any pending local disputes as to the rates of wages should be settled by the County Federations of employers on the one side, and the Executive of the Union or Unions on the other side.

I do not propose to make any definite suggestions with regard to any other points which one side or the other may possibly desire to raise, as all I think necessary is to submit a frienly basis of discussion on the main issues.

The men, however, took the view that the Conference had been too hastily called. They declined to accept the basis, and agreed to submit certain proposals of their own.

On the following day the employers wrote :—

National Association of Master Builders of Great Britain and Ireland. South Crescent Chambers, 6, Lord-street, Liverpool, June 6, 1899.

Dear Sir,—As you are aware, a meeting of employers and operatives was held yesterday in Derby with a view to arranging a basis for the proposed General Conference.

The terms submitted by you were laid before the operatives' delegates and declined. They informed the employers that they were prepared only to consider the question of the formation of a National Conciliation Board.

The results of these negotiations was laid before my council, when the following resolution was passed, which I was instructed to convey to you :—

> "That inasmuch as the representatives of the trades unions are unwilling to adopt the proposed basis for conference, they be requested to submit, within fourteen days, their own basis for the consideration of this Association, and that the conference be postponed accordingly."

I regret the efforts of yourself and Mr. Edwards have not met with a better result, and I am sure that if an occasion arises prior to the expiration of the fourteen days whereby you can assist in bringing about the General Conference, my council would fully appreciate your valuable co-operation.

Thanking you on behalf of the Association for the trouble you have taken in the matter.—I am, dear Sir, faithfully yours, J. A. S. Hassal, Secretary.

The Editor of the *Daily News*.

A few days later the editor again opened communication with several representatives of the trades unions, to whom he suggested that a preliminary Yorkshire conference might perhaps facilitate a general settlement.

Mr. Chandler, of the Amalgamated Carpenters and Joiners, wrote :—

Dear Sir,—I have consulted my colleagues respecting the suggestion contained in yours of the 9th inst., and they are unanimously of the opinion that whilst our thanks are due to you for the interest taken, and the labour bestowed in your endeavours to devise a satisfactory basis on which a conference of the building trades could take place, they feel that in dealing with the general questions there are so many divergent views to consider, that it will be far preferable to leave for the present the arrangements and settlement in the hands of the trades whose services the Yorkshire employers have dispensed with.

Had we received any direct complaint from them before the lock-out commenced we should (so far as our trade is concerned) have been pleased to have investigated the same, and probably have arrived at an amicable understanding, much easier than is possible whilst men are under the impression that a most unjustifiable attack has been made upon them without any sufficient reason.

The opinions here expressed on behalf of the joiners were, we understand, generally held by the representatives of the other trades when meeting at Derby.—Again thanking you, I remain, yours truly,

F. Chandler, General Secretary.

Manchester, June 12th, 1899.

Mr. Batchelor, of the Operative Bricklayers' Society, wrote :—

Sir,—I am directed to acknowledge yours of the 10th inst., and inform you it has been placed before my council, who are consulting our Yorkshire branches on the matter.—Yours faithfully, John Batchelor.

The Yorkshire branches of the Bricklayers having agreed to a Yorkshire conference, we placed ourselves in communication with Mr. Nicholson, of the Yorkshire Federation of Employers, who wired on June 23 :—

"Cannot carpenters be brought into conference? If not, let me know, and I will make other arrangements."—Nicholson, Leeds.

We expressed the view that the proposed conference with the bricklayers alone would facilitate the settlement. Thereupon the conference with the bricklayers was fixed and took place at Leeds, as reported last Friday week.

In the mean time Mr. Clem. Edwards, the representative of the *Daily News*, was sent North to interview the several parties interested, and after spending some days negotiating with Mr. Wilson, of Bolton, and Mr. Chandler, of Manchester, on behalf of the unions; Mr. Hassal, Liverpool, on behalf of the National Association of Master Builders; and Mr. W. Nicholson and Mr. Rhodes, Leeds, on behalf of the Yorkshire Federation of Master Builders, a way out of the deadlock was discovered. The two following documents explain themselves :—

As the result of private conversation between Mr. Nicholson on behalf of the Yorkshire Federation of Employers and Mr. C. Edwards, of the *Daily News*, it is understood—

(1) That the National Association of M.B. shall at once invite the representatives of the trades to a National Conference.

(2) That this Conference shall discuss and settle (subject to ratification by the respective associations) points in dispute, which either side may bring forward, together with the formation of a National Conciliation Board.

(3) That upon the men's representatives formally accepting this invitation, the N.A.M.B. shall at once instruct the Yorkshire Master Builders' Federations to declare the Yorkshire lock-out "off," pending final settlement.

W. Nicholson, C. Edwards (of the *Daily News*).

6, Lord-street, Liverpool, July 14, 1899.

Messrs. Wilson and Cherry, Chairman and Secretary, Joint Committee of Trades Unions, Manchester.

Dear Sirs.—As the result of private conversation with Mr. Clement Edwards, of the London *Daily News*, I understand that the representatives of the Trade Unions might be willing to meet this Association in a National Conference, upon the following basis :—

(1) That the Conference consist of nine or twelve a side, as agreeable to you.

(2) That the Conference shall discuss and settle (subject to ratification by the respective Associations) points in dispute which either side may bring forward, together with the formation of a National Conciliation Board, as submitted in Mr. Cherry's letter of the 22nd June.

(3) That upon your Joint Committee of the Trade Unions formally agreeing to take part in such a Conference, the Yorkshire lock-out to be declared at an end, pending final settlement.

If these proposals meet with the approval of your Committee, I would suggest that the Conference shall be held at the Salisbury Hotel, London, on Thursday, July 27th, at 11 a.m.—Yours faithfully,

(Signed) Jas. Hassal, Secretary.

In accordance with these arrangements, the Yorkshire lock-out was withdrawn, and the conference took place on Thursday week.

The Masters were represented by: Mr. T. Gregory (London), Mr. J. Howard Colls (London), Mr. R. Neil (Manchester), Mr. Alderman Bowen (Birmingham), Mr. W. Nicholson (Leeds), Mr. A. Crouse (Bristol), Mr. W. E. Blake (Plymouth), Mr. J. H. Walters (Selby, Yorks), Mr. J. Spink (Sheffield), Mr. W. Cunliffe (Bolton), Mr. J. Wright (Nottingham)—this latter gentleman at the last moment taking the place of Mr. G. Mansfield, York, and Mr. J. Townsley (Hull). Mr. Jas. Hassal, secretary of the National Association of Master Builders, was also present.

The Trade Unions were represented by the following delegates from the Trade-Unions Committee:

Mr. W. T. Wilson (Amalgamated Society of Carpenters and Joiners), Mr. J. Davenport (United Order of Labourers), Mr. W. Stevenson (United Builders' Labourers' Association), Mr. H. Pickard (Gas Workers and General Labourers' Society), Mr. W. Matkin (General Union of Carpenters and Joiners), Mr. W. Macintyre (Associated Painters, Scotland), Mr. G. Clark (Operative Society of Bricklayers, Manchester Order), Mr. G. B. Sunley (Amalgamated Society of House and Ship Operative Painters and Decorators), Mr. T. Parks (General Secretary of the Amalgamated Society of Woodcutters), Mr. G. M. Cherry (Operative Plumbers' Society), Mr. M. Dennis (Operative Stonemasons' Society), Mr. T. Batchelor (Operative Society of Bricklayers, London Order), and Mr. E. C. Gibbs (Amalgamated Society of House Painters and Decorators).

Mr. T. Gregory was voted to the chair.

The chairman explained that the meeting had been convened as the result of friendly negotiations kindly carried on by the Editor of *The Daily News*, for the purpose of discussing any grievances which existed between them as employers and employed; and, as there had been a great deal of trouble in Yorkshire, it would be convenient to take that case first.

In reply to a question, Mr. Nicholson said the Yorkshire lock-out had been withdrawn.

The following points were then submitted by the Masters:—Compelling foremen who represent the employers to join the operatives' unions. They proposed that no foreman should be compelled to join a trade-union, or compelled to leave one. Their definition of the word foreman was one who was constantly in charge of work, and one not continually laying bricks. The next point was the refusal of operatives to work with non-unionists; that, as to demarcation of work, employers and employees should settle this, and during the interim no men should be withdrawn; the refusal to fix material worked or partially worked in other districts; and the limitation of apprentices. These five points were separately discussed. The operatives held that several of them would be met by the proposed basis for the establishment of a Board of Conciliation, to be subsequently considered, which they held was the real object of the meeting. No decision was arrived at with regard to the foremen or as to the non-unionists. It was agreed to meet the difficulty in regard to the demarcation of work under the conciliation scheme. The men explained that they only objected to fix work prepared in districts where unfair conditions prevailed; and, as to the apprentice question, it was practically agreed that this was essentially a question for the local associations to settle, no national rule on the subject being practicable. A friendly spirit prevailed on both sides throughout the discussions; but the men explained that it was impossible for them to agree to any arrangement which would enable non-unionists to obtain the advantages which the trade unionists had fought for and were paying for. They also expressed a general opinion that as long as apprentices were legally bound they did not desire to limit the number specifically, though this view was excepted to by one or two delegates. The employers, on the other hand, expressed themselves satisfied with the view that apprentices should be legally bound, but the definite decision was held over for the local associations.

After lunch the question of the establishment of a Board of Conciliation was discussed. The men had, at the request of the masters, prepared a scheme as a basis for the conference, and submitted a series of "proposed rules for the prevention and settlement of disputes in the building trades." The principle of arbitration and conciliation was unanimously accepted by both sides.

The Chairman said this was a highly important question, but it was a step in the right direction: they were meeting as a conciliatory body.

The two first rules were agreed to as follows :—

1. The objects of the Board shall be to adjust by conciliatory means all questions relating to hours of labour, rates of wages, and working rules generally, that may from time to time arise, and may be referred to it by either employers or employees, and by mediation prevent strikes and lock-outs, and assist in the settlement of disputes that may take place in the building trades.

2. There shall be district committees, the number to be decided locally, equally representative of the employers and employées, and a Central Board, consisting of 15 employers and 15 operatives.

The third rule was submitted as follows:—"In the event of any dispute arising between the members of a society or societies and the employers, and failing a settlement between the disputants locally, the question at issue shall be referred to the district committee, and should this body fail to agree, the matter shall be referred to the Central Board, and, failing a decision on their part, the matter shall be laid before a board of disinterested referees, whose decision shall be binding on both sides. In all cases work shall go on without stoppage pending a settlement." It was desired to add to this some provision for the settlement of disputes in regard to the demarcation of work. After a long discussion, it was resolved that the clause should read as follows:—

3. In the event of any question arising between trade societies with reference to the demarcation of work, or in the event of any dispute arising between the members of a society or societies and the employers, and failing a settlement between the disputants locally, the question at issue shall be referred to the District Committee, and should this body fail to agree, the matter shall be referred to the Central Board, and, failing a decision on their part, the matter shall be laid before a board of disinterested referees, whose decision shall be binding on both sides. In all cases work shall go on without stoppage pending a settlement. The committee for the demarcation of work shall consist of three representatives of each trade affected and three master builders.

4. The Central Board shall meet annually in March for the election of officers for the ensuing twelve months, the appointment of 12 referees, and for the consideration of any alteration in the constitution or rules of the Board.

5. The employers and employees shall each appoint a secretary, to whom shall be sent the names of the representatives of the various societies at least fourteen days prior to the annual meeting of the Board.

6. The Central Board shall consider all questions referred to it by the District Committees, and, if possible, settle the same. Failing a decision on their part, the question shall be referred to three referees such referees to be selected from the twelve already appointed and approved of by both sides of the Board. The decision of the Central Board or the Board of Referees, as the case may be, shall be final and binding on both sides.

7. In the event of any dispute being referred by a District Committee to the Central Board, the said board shall meet within seven days after the question has been sent to the joint secretaries.

8. All meetings of the Central Board shall be convened by the joint secretaries.

9. No subject shall be brought forward at any meeting of the Board except with the consent of a two-thirds majority of the representatives present, unless seven days' notice thereof has been given to the secretaries.

10. In the event of a dispute in any district the District Committee shall meet within five days after having been requested by the secretary of the Employers' Association or the union or unions affected.

11. Two-thirds of the representatives of the employers and an equal number of the employees shall constitute a quorum at any meeting of the District Committees or Central Board. The voting powers of employers and employees to be equal in all cases.

A provision to make a majority of two-thirds necessary for decisions of the District Committees or the Central Board to be binding, caused much discussion; a proposal to delete the clause was not carried, an equal number voting on either side; the men's representatives agreed to take out the condition of a two-thirds majority, and the clause was settled as follows:—

> 12. Any decision of either District Committee or Central Board to be binding must be carried by a majority of those present.
>
> 13. If any representative die, resign, or otherwise cease to be qualified, a successor shall be appointed within one month; and should a representative be unable to attend any meeting, a duly appointed substitute may attend in his place.
>
> 14. Any party to this agreement desirous of withdrawing from this Board may do so on giving twelve months' written notice thereof to the joint secretaries.
>
> 15. No alteration shall be made in the rules or constitution except at an annual meeting of the Central Board, and at least one month's notice, in writing, must be given specifying the nature of the proposed alteration.

The above scheme will have to be submitted to the members of the various operative societies for confirmation, and it was resolved to adjourn the Conference till some convenient time a month or six weeks hence, when another meeting will be held in London.

Mr. Wilson remarked that all the grievances were not on the side of the employers, and incidentally mentioned that questions they wanted considered were those of a uniform rate of wage and an equitable rate of wage throughout the country; a uniform working week was also a matter on which they held strong opinions. These would have to be entertained when other matters were discussed.

The Chairman said he drew good auguries from that Conference, for the discussions had been conducted with perfect good temper and fairness. The work of the Conference was not yet completed, and before the adjourned meeting was held both sides would be able to think over the points which had been raised by each. These matters had better be reduced to writing, so that a complete agenda could be prepared for the next Conference, and the representatives of both sides come prepared with the knowledge of what they were to discuss.

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The peal of bells in the tower of St. Mary's Church, Fordingbridge, Hants, has been rehung, tuned, and quarter-turned, and the number of bells increased from six to eight.

The town council of Stamford have, after a protracted discussion, adopted, by a majority of one vote, a scheme for the sewerage of the borough prepared by Mr. Everard, C.E.

Extensive sanitary work and improvements in the wards are now being carried out at the Royal Orthopædic Hospital, Oxford-street and Hanover-square, W., the cost of which will exceed £1,000.

Preparatory measures are being taken towards the construction of the long-contemplated Great Northern and City Railway Company. The report for the half-year ended June 30 states that a shaft has been sunk to the level of the tunnel, and a full-sized heading driven therefrom into the centre line of the tunnels. Shafts will shortly be sunk at Essex-road and Old-street, and work will be started at Finsbury-pavement and Drayton-park as soon as the necessary possession of land is obtained.

A Parliamentary paper gives details of supplementary estimates of further sums required to be voted for the Civil Services for the year ending March, 1900. The total amount required is £183,676. Among the various items is a sum of £4,000, required to complete the restoration of the State rooms and banqueting house at Kensington Palace; while £13,000 is set down for the purchase of a site adjoining the Dublin Museum of Science and Art for a new College of Science.

OBITUARY.

We regret to record the death of Mr. Charles Boyes Noel Snewin, mahogany and timber merchant, of 7 to 17, Back Hill, Hatton Garden, and 29, Ray-street, Farringdon-road, E.C. He had been in failing health for some time, but about a fortnight since he was seized with a paralytic stroke, and completely prostrated. He was brought to London, and died at 14, Upper Phillimore-place, Kensington, on the 16th inst. Mr. Snewin was 63 years of age, and had been in the business 41 years, having succeeded his father, who commenced it in a small way early in the century. At first he traded in partnership with his brother, who was killed in the yard by an accident. Mr. C. B. N. Snewin was a keen, but one of the most honourable, men of business we have ever known. Owing to greatly increasing trade, the premises have been recently further extended, and the business will be carried on as usual. The sons, Mr. Herbert Charles Snewin and Mr. Ernest Oliver Snewin, have been connected with the business about 12 years, and the able manager, Mr. Thomas Terry, has been with the firm 25 years. The funeral took place on Thursday week at Highgate Cemetery, a previous religious service having been held at St. Paul's Church, Onslow Gardens, Kensington.

It is with much regret that we learn of the death of the senior partner in the old-established firm of Messrs. Jas. Stiff and Sons, of the London Potteries, Lambeth, Mr. William Stiff, which took place on the 19th inst. The business will continue to be carried on under the same style by the surviving partner of the original firm, Mr. Ebenezer Stiff, with the assistance of the three junior members of the firm, Messrs. Sydney J., James A., and W. Frederick Stiff.

Professor Benedetto Civiletti, the Sicilian sculptor, died at Palermo on the 23rd inst. In 1878 his "Canaris" was very favourably placed in the Paris Exhibition, and earned him much repute. He returned from Paris with the Legion of Honour and membership of the Institute of France. This success was due, in great degree, to the appreciation of him which Renan expressed. Civiletti, since his "Canaris," appears to have lost inspiration; he scarcely produced anything which came up to that work. The "Canaris," bought by the Government, was placed in a public garden at Palermo, where it is not seen at its best.

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CHIPS.

The Bristol Corporation have had a connection plan prepared by the city engineer for constructing a footbridge over the Feeder Canal from Silverthorne-lane to Feeder-road. The estimated cost, including approaches and purchase of land, is £4,000.

The formal opening of the Prince's Rock electric tramway system and the electric lighting of the borough of Plymouth, will take place three weeks hence. The works are being carried out from plans by, and under the supervision of, Mr. J. E. Rider, C.E.

Memorial stones of the new Wesleyan chapel at Castle Bytham, near Stamford, were laid last week. The chapel is about to be reconstructed on an enlarged site. Messrs. Hinson Brothers, of Stamford, are the builders.

On Thursday week the ceremony of laying 15 memorial-stones took place at the new Central Hall, which is now in the course of erection in Bermondsey New-road. The hall, which will cost £30,000, is the first central hall erected in London for mission work by the Wesleyan Methodists.

Last Friday, the Electric-lighting Committee of the Dudley Corporation issued a report recommending the acceptance by the Town Council of the following tenders, amounting to £21,472, for permanent work and plant for electric-lighting and power station:—Messrs. Babcock and Wilcox, £2,017, for boilers, &c.; the Westinghouse Company, £6,169, for machinery, &c.; Callender's Cable Construction Company, £7,146, for cables and street work; Messrs. Johnson and Phillips, £423, for street lighting; Messrs. Whittaker and Co., £5,466 18s. 3d., for building stack, engine-beds, and £250 for travelling crane (estimate).

The work of strengthening and repairing the tower of Dry Drayton Church, Cambs, is proceeding apace. Owing to a crack in the west wall near the belfry window, the foundations have been looked at and filled in with concrete. The walls north and south have been pierced, and two stay-bars have been fixed. The bells have not been rung for some little time. Messrs. Redding and Son, Cambridge, are doing the work.

Building Intelligence.

Bristol.—A new library is to be erected in Cheltenham-road, Bristol, opposite the Colston Girls' School, for the accommodation of the inhabitants of the northern district of Bristol. The site cost £2,575, and the contract for the library has been let to Messrs. Wilkins and Son for £7,439. The building, which has been designed by Mr. W. V. Gough, of Bridge-street, will comprise a spacious reading-room in addition to the lending department and other offices.

Durham.—On Tuesday afternoon, the Earl of Durham laid the foundation-stone of a new technical school for Durham. The building will occupy a space in depth of 77ft., and in width of 46ft. It is to be built of red brick, with red tiled roof, the entrance doorway being of stone. The architects are Messrs. Oliver and Leeson, of Newcastle. From the roof rises a handsome turret, which also forms the ventilating shaft, to which special attention has been paid, and which will be carried out on the Boyle system. There are three stories. On the lower story is the physical laboratory with dark-room, science class-room, kitchen, heating-chamber, &c. On the ground floor is the chemical laboratory, lecture-room, preparation room, science class-room, secretary's room, balance room, cloakrooms, store, &c. The first floor is devoted to the art department. The contractors for the erection of the building are Messrs. J. G. Gradon and Son, of Durham, and the total cost of the site and contract will be about £5,250, exclusive of the furnishing.

Liverpool.—The Countess of Derby, on Tuesday, laid the foundation-stone of the Liverpool Diocesan Church House, the first section of which is in course of erection at the corner of Lord-street and South John-street. This section will comprise on the ground floor various offices. The Diocesan Finance Association, with complete suite of offices, boardroom, and waiting-rooms, will occupy the first and second floors, and on the top floor will be found the diocesan library, with its associated reading and writing rooms. The central tower will provide one or two smaller offices, and there will be the main entrance opening into South John-street, with lift and large staircase. When the entire building running from Lord-street to Cable-street has been erected, it is intended to find accommodation in the basement for a muniment room, to hold the diocesan records, as well as other valuable papers; on the ground floor for a consistory court and shops for the S.P.C.K., some church furnishers, and other tenants, besides a café; on the first and second floors offices for the Sunday School Institute, C.E.T.S., and many other societies, besides more committee-rooms; and at the top of the building other smaller offices, as well as a large hall capable of holding from 400 to 500 people. The architect is Mr. G. Bradbury, of 14, Cook-street, Liverpool, and the builders are Messrs. Mayor and Co.

Middlewich.—The foundation-stone of new Catholic day schools in connection with St. Mary's Church, Middlewich, was laid on Saturday week. The new building will consist of one large central hall or assembly room, measuring 65ft. by 21ft. 6in., and 19ft. high to the ceiling, with infants' room 20ft. by 21ft. 6in.; girls' cloak-room and entrance on the north side. There will also be a porch and boys' cap room and entrance on the south side. The elevation of the building will be of picked red bricks with terracotta dressings to windows and doors. The roof will be covered with blue slates, with a terracotta ridge and finials, and the length of the ridge will be broken by a turret inclosing one of Messrs. Boyle's exhaust ventilators. Efficient ventilation will be provided on the natural system, the fresh air entering the rooms by means of inlet brackets, and the vitiated air being extracted. The schools have been designed to accommodate 220 scholars. Mr. Harold Sheldon, Middlewich, is the architect.

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The new vestry and the chancel improvements in the parish church of Swaffham have just been completed. The enlarged vestry is built of flint and Bath stone dressings, has two windows, and is fitted inside for the use of the choir. The large piece of wall in the chancel has been replastered, and the blocked window on the south side opened up and filled with glass. All the work has been carried out by Mr. George Jeffries, builder.

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ILLUSTRATIONS.

THE SIR WM. FRASER HOMES, HAILES, COLINTON.—ST. JAMES' COURT, WESTMINSTER. — ANCIEN HOTEL DE VALOIS, CAEN.—THE NORMAN STAIR TURRET, CHRISTCHURCH PRIORY.—DRAPERY WAREHOUSE, ABERDEEN.—CHETHAM COLLEGE, MANCHESTER.

Our Illustrations.

THE SIR WM. FRASER HOMES, HAILES, COLINTON, N.B.

These homes are being built for the benefit and accommodation of twelve artists or literary persons in reduced circumstances. The buildings comprise a group of twelve separate dwelling-houses facing a central court, with a large hall and reading-room common to the inhabitants. The accommodation varies in the different dwellings from two rooms with scullery, &c., to four rooms and scúllery, &c. The building is of local stone, harled and whitewashed, with red corncockle stone dressings. Attention has been given to the laying-out of the courtyard, terrace walk, and screen walls as forming an important feature in the whole design. The courtyard has a southern aspect, and commands an uninterrupted view of the Pentland Hills. Mr. A. Balfour Paul, of Edinburgh, is the architect of this useful and picturesque undertaking shown by the accompanying bird's-eye view and plan of the ground floors. The perspective we have reproduced from the original drawing, which was shown at the Royal Scottish Academy Exhibition at Edinburgh this year.

ST. JAMES' COURT, BUCKINGHAM GATE, S.W.

These buildings, which consist of residential flats, shops, and offices, are built in the style of Flemish Renaissance freely treated. The elevations are carried out in Portland stone and Bracknel red brick, with faïence treatment of the lower stories. The entire construction of the walls, partitions, floors, and roof is of fire-resisting material. Great care and attention has been given to the fire escapes from the upper floors. The residential flats have outside balconies, and staircases to the ground level, and also wide staircases on to the roof of each block. The buildings are arranged on plan with a central square courtyard. The buildings are approached by two large carriageway entrances from the front. The public rooms consist of a *salle-à-manger*, restaurant, billiard-room, smoking, drawing, and reading-rooms. On the floors above, the rooms are arranged in various sized suites. The passenger-lifts, luggage, and service-lifts have been provided by Messrs. Waygood, of Falmouth-road, Great Dover-street; the plumbing and sanitary work by Messrs. Beaven and Sons, of Victoria-street, and of Gloucester; the sanitary and drainage fittings, and also the faïence work by Messrs. Doulton, of Lambeth. The drawing has been lent us by the architect of the fabric, Mr. C. J. C. Pawley, of Westminster.

HOTEL DE VALOIS, CAEN.

This well-known example of 16th century French Renaissance has been often drawn, and its frequent description in standard works renders an account here unnecessary. Seldom, however, has a measured drawing of the elevation been given, and, therefore, the detail drawing which we publish to-day, from the pencil of Mr. G. Salway Nicol, of Birmingham, will be welcomed by many who will be glad to possess so careful a rendering of the work, with sections and notes. The author has been for some months travelling in Italy on an architectural tour, and on his return we hope to be enabled to print some further examples of his artistic studies. A very capital view of the Hotel de Valois, or the Hotel de la Bourse as it is now called, appeared in the Building News for January 7, 1898.

CHRISTCHURCH PRIORY, HAMPSHIRE.*

The circular staircase turret given is the most interesting part of the Norman work in Christchurch Priory, Hants. Built by the notorious Bishop Flambard, in the reign of William Rufus, of Portland oolite and limestone from the Isle of Wight, it is placed on the north-east corner of the north transept, where it forms a striking and original feature. It is divided into three stories, exhibiting in each the arcading so often adopted by the Norman architects, and of which an excellent example may be seen in Durham Cathedral, also by Flambard. The concentration of detail on the lowest story of the turret, and the diminution in size of arch and column and quantity of ornament in the succeeding stories, is interesting. The lowest arcade is an example of the use of intersecting arches: the columns are ornamented with zigzag reticulated and spirally-arranged lines, the spandrels are filled with scale pattern, and the arch mouldings with herring-bone ornament. The stringcourse above has billeted and plain zigzag ornament. The second story has an arcade of double plain columns with simple arches without decoration. Above these, and up to the next stringcourse with its chevron ornament, is a diamond-shaped network of projecting members, each semicircular in section. The final story has single shafts and plain arches in its arcade, surmounted by a stringcourse of billet moulding. The top is crowned by a non-descript stone roof, which takes the place of the original conical or pyramidal covering. The caps are in each case voluted at the angles, and vary in detail, the bases being of the Attic character, without corner ornaments. The interlaced arcade is carried to the right, along the lower part of the north face of the transept as far as the north-west corner, where it is terminated by a columnar pilaster or buttress. Both this and the west arcade are carried to the left, round a segment of what may have been an apsidal chapel. The shafts of the upper arcade, one shaft of the second, and all the shafts and capitals of the lowest arcade, are restorations.

George Marples.

DRAPERY WAREHOUSE, ABERDEEN.

This building is being erected on a prominent site at the corner of John-street and George-street, directly opposite the offices of the North of Scotland Bank. The walls are built of granite from the local quarries. The ground and first floors contain well-lighted spacious saloons and abundant accommodation for carrying on an extensive drapery business. The building, which will be lighted by electricity, is being erected for Mr. A. R. Duncan, who previously occupied an old building on the same site. Messrs. Brown and Watt, Aberdeen, are the architects, and the estimated cost of the building is £5,000.

CHETHAM COLLEGE, MANCHESTER.

(For description and further sketches see p. 123.)

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The Cape Town Corporation are about to build themselves a palatial town-hall covering an area of 80ft. by 175ft., Italian Renaissance in style, and three stories in height, with central clock-tower rising to an altitude of about 200ft. The architects are Messrs. Reid and Green, of Cape Town.

The Vandyke Tercentenary will be celebrated at Antwerp by an exhibition to remain open from August 15th to October 15th. In a temporary building adjoining the new picture gallery or Musée des Beaux Arts 106 paintings will be on view in four rooms, while in a fifth there will be a fine collection of photographs relating to subjects in the life of Vandyke. English owners are the largest contributors, their total out of the 106 being 37, whereas Belgium herself comes second with 31.

STATUES, MEMORIALS, &c.

The Flora Macdonald Memorial at Inverness.—The memorial of Flora Macdonald was unveiled on the Inverness Castlehill on Wednesday week. The statue was designed by Mr. Andrew Davidson, sculptor, and was cast in bronze in Rome. The figure is 9ft. in height, standing on a granite pedestal about 15ft. high. The Highland heroine, with right hand shading her eyes, is looking across the waters for the boat containing Prince Charlie. At her right side, a rough collie, with head thrown back, watches her face, and her left hand holds the skirt of her upper garment. The costume is that which was worn by ladies of the period.

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CHIPS.

Mr. Edmund Sedding, of Plymouth, has prepared plans for the restoration or repairing of St. Crantock, St. Constantine, St. Cubert, and Tremain parish churches, Cornwall.

The new Roman Catholic Church of the Holy Name has just been opened at Oxton, near Birkenhead. The building is Gothic in style, and faced both within and without with red bricks. It consists of nave, aisles, chancel transepts, and sacristry, providing accommodation for 250 persons, and has been built by Mr. R. Allen, of Birkenhead, from designs by Mr. Edmund Kirby, F.R.I.B.A., of Liverpool.

Extensive business premises are in course of erection at 10 and 11, East Parade, Leeds, from the designs of the architect, Mr. Walter A. Hobson, Albion-street, Leeds.

Mr. C. A. L. Prussmann, chief assistant electrical engineer to the Bradford Corporation, has been appointed clerk of works of the Doncaster electricity works. There were between 60 and 70 applicants for the post, which carries a commencing salary of £200 a year.

New business premises two stories in height, and with an oriel and domed turret at the corner of the two streets, have just been built at the Cross at Carnoustie, N.B. Mr. D. Fraser, of Carnoustie, was the architect, and Messrs. A. Blach and Son were the masons, and Messrs. A. Watt and Sons the joiners.

It is proposed by a syndicate to revivfy the market at Marylebone, and to reconstruct the buildings at a cost of some £70,000, from plans by Mr. H. T. Gordon, F.R.I.B.A.

At a special meeting of Dartmouth School Board it was decided to carry out the recommendations of Mr. G. S. Bridgman, of Paignton, with reference to the system of drainage at these schools. The whole system is defective, which it is quite impossible to remedy without reconstruction.

The building of the new infirmary at the workhouse at Rochdale has been commenced. When completed, the infirmary will accommodate between 300 and 400 patients. Messrs. Butterworth and Duncan are the architects, and Messrs. Ashworth and Woolfenden, all of Rochdale, the contractors for the new building.

Memorial stones were laid last week at Burslem of classrooms which are being added to the Sytch mission church. The architect is Mr. W. H. Walley, of Burslem.

During the progress of the works in connection with the new docks and at the excavation of the Grange Burn, Grangemouth, Stirlingshire, which is being directed by Messrs. Brand and Son, contractors, a valuable find has been made by the workmen in the shape of an earthenware pot containing 1,200 silver coins of the 16th and 17th centuries of English, Spanish, Belgian, and other countries.

Mr. J. S. Killick, of Barming, Kent, has been appointed, out of three selected applicants, surveyor and sanitary inspector to the Maidstone Rural District Council, at a salary of £225 per annum, apportioned as to £150 for the surveyorship, and £75 as inspector.

The erection of a new Congregational church in the Walsall-road, Wednesbury, has been decided upon, and plans prepared by Mr. C. W. D. Joynson have been accepted, it being understood that building operations will be commenced in the spring of next year. The cost is estimated at over £3,000.

Steeple-jacks are now at work on the spire of Norwich Cathedral. The work includes pointing the spire downwards for a length of 40ft., replacing the lightning-conductor with a new one from top to bottom, renewing the rusted iron band which runs round the highest lucernes and has practically rusted away, and repainting and adjusting the cock and cross. The contractors are Messrs. J. W. Gray and Co., of London, and the work is being carried out under the direction of Mr. C. J. Brown, the architect to the Dean and Chapter. It is just a quarter of a century since the spire, which rises to a height of 318ft., was last ascended by workmen.

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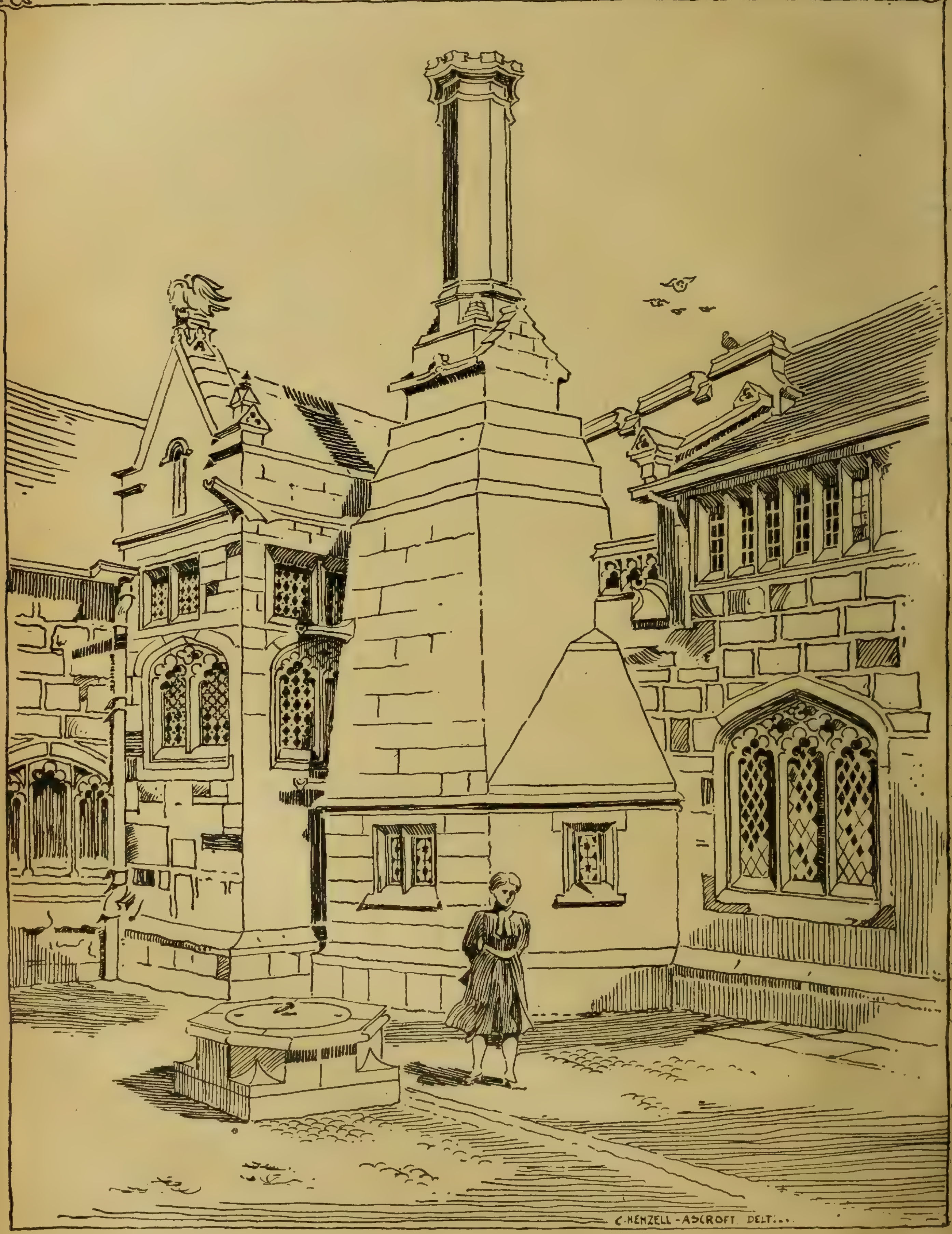
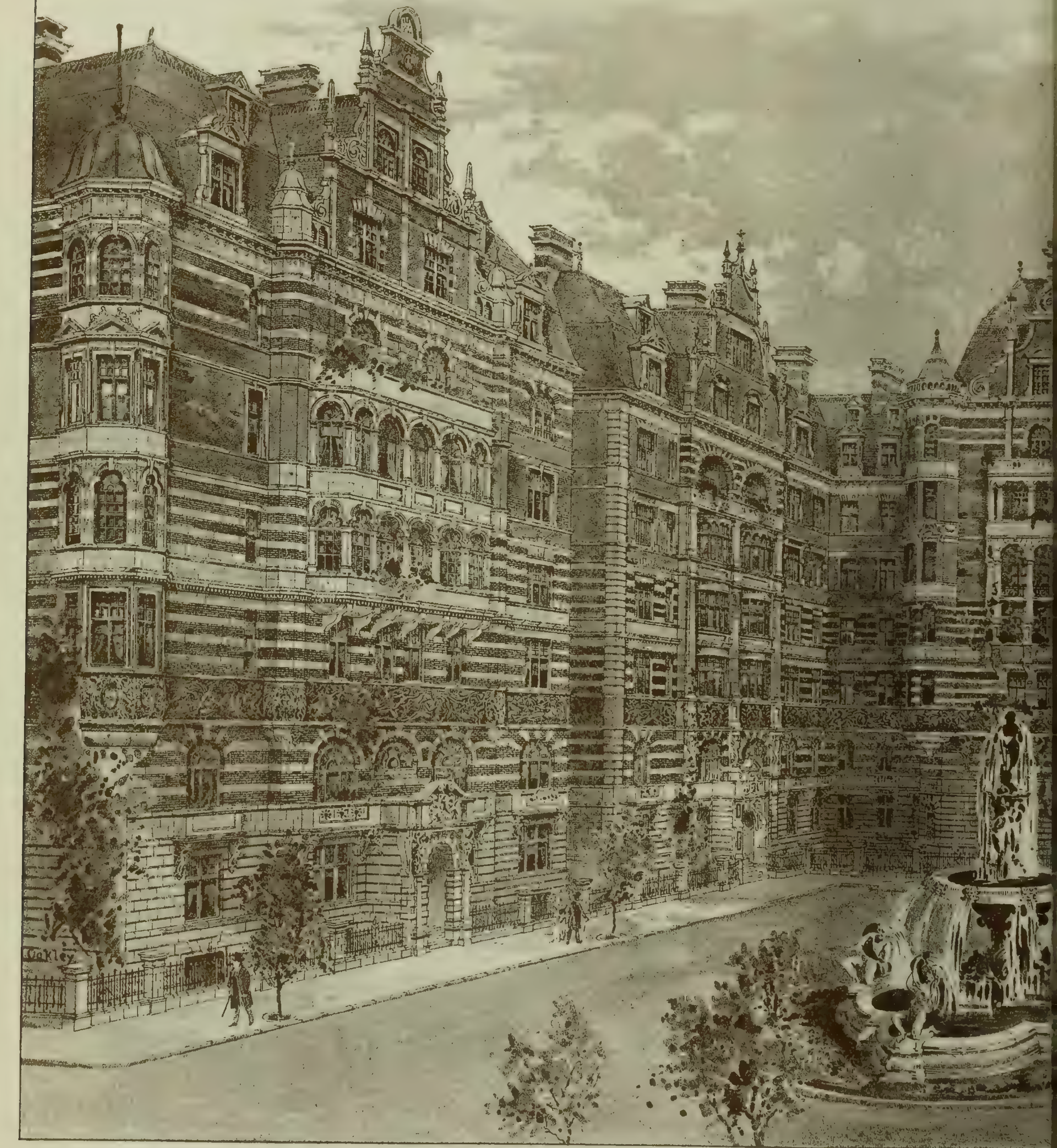
* Other drawings of this building will be found in the Building News for Oct. 29, 1886, Dec. 16, 1887, and Dec. 8, 1893.

EXTERIOR OF INGLENOOK CHETHAM'S COLLEGE MANCHESTER


C. HENZELL-ASCROFT DELT.

ST JAMES' COURT BUCKINGHAM GATE · INTERIOR OF QUADRANGLE · C·J·PA



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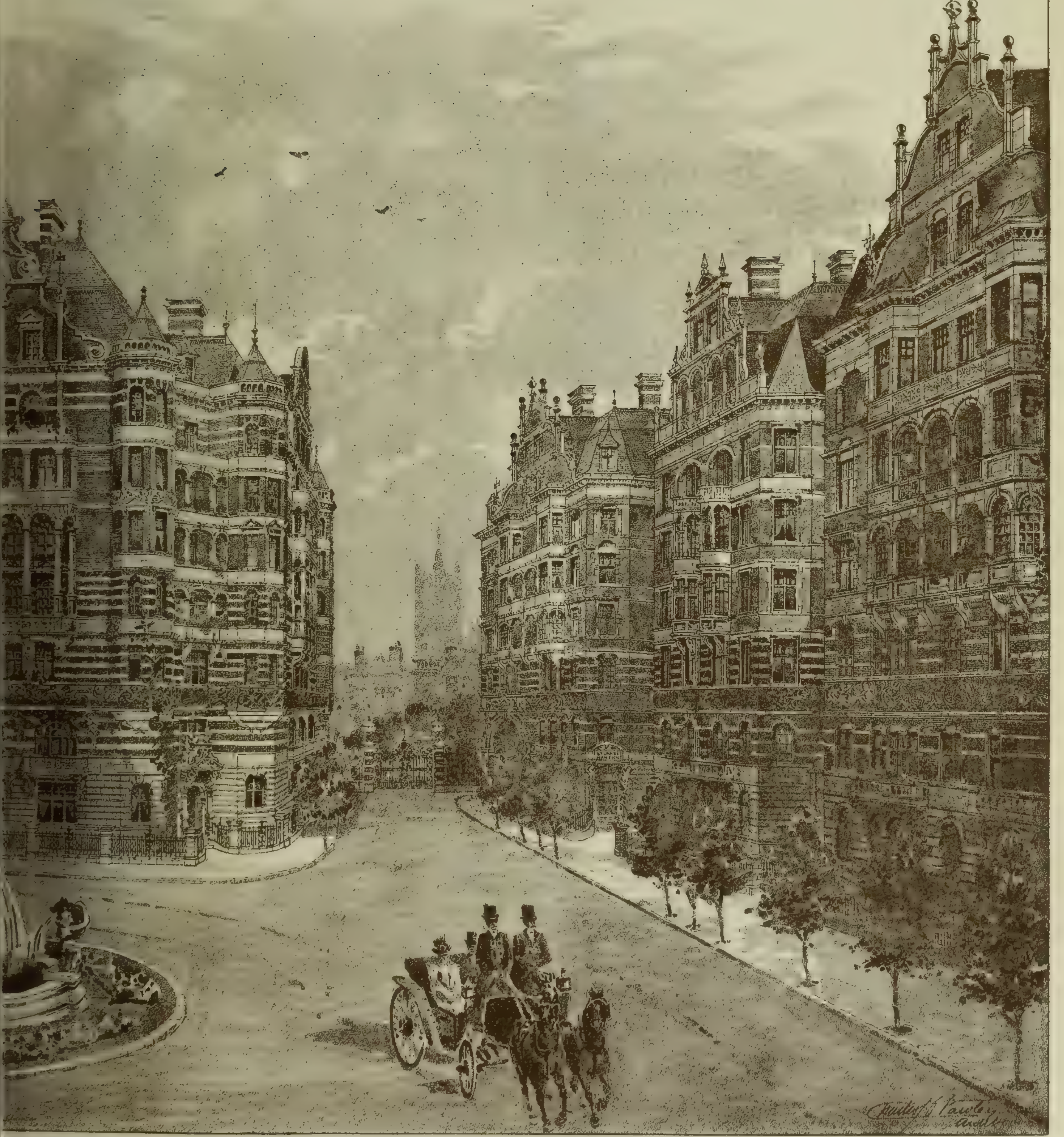
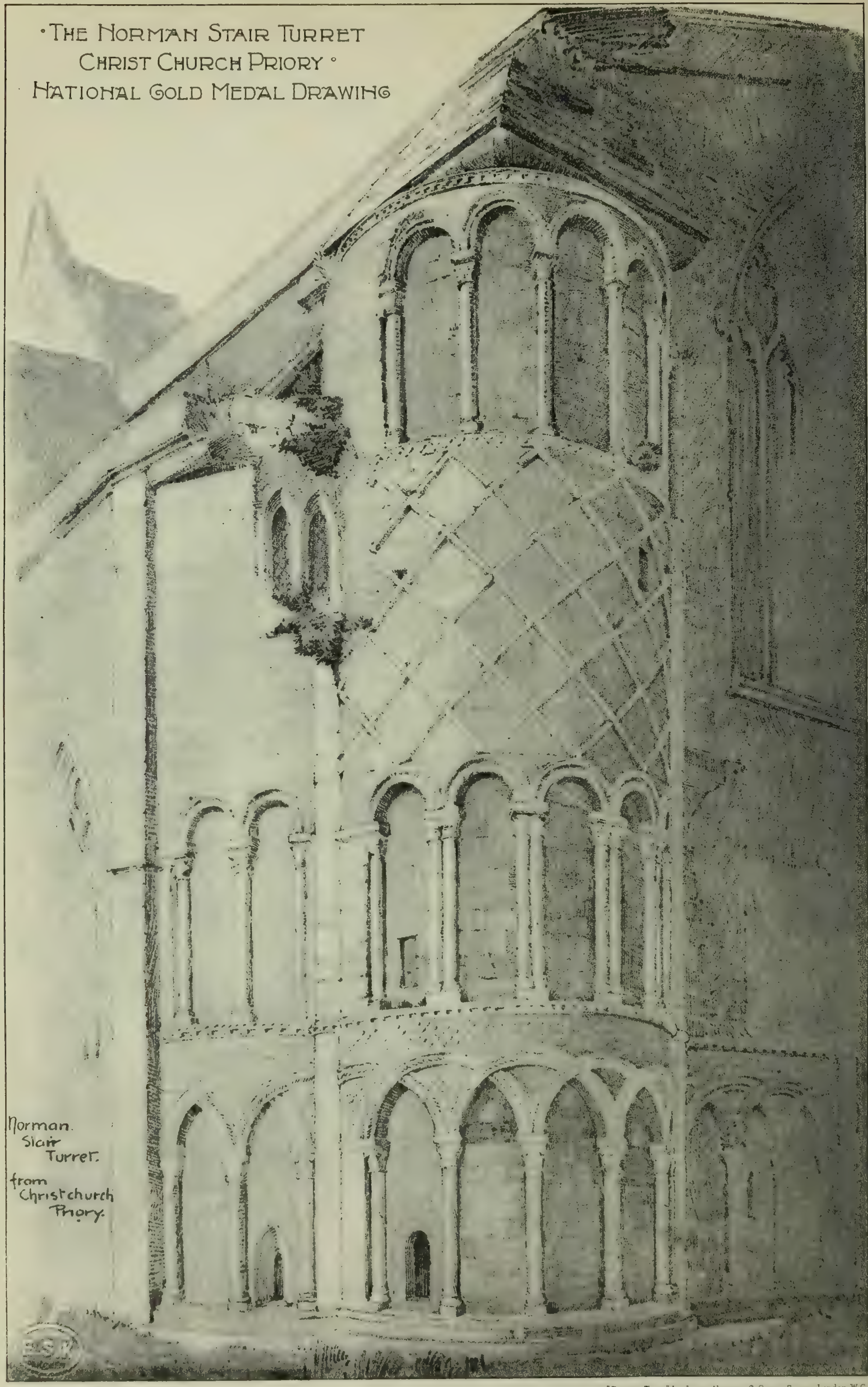
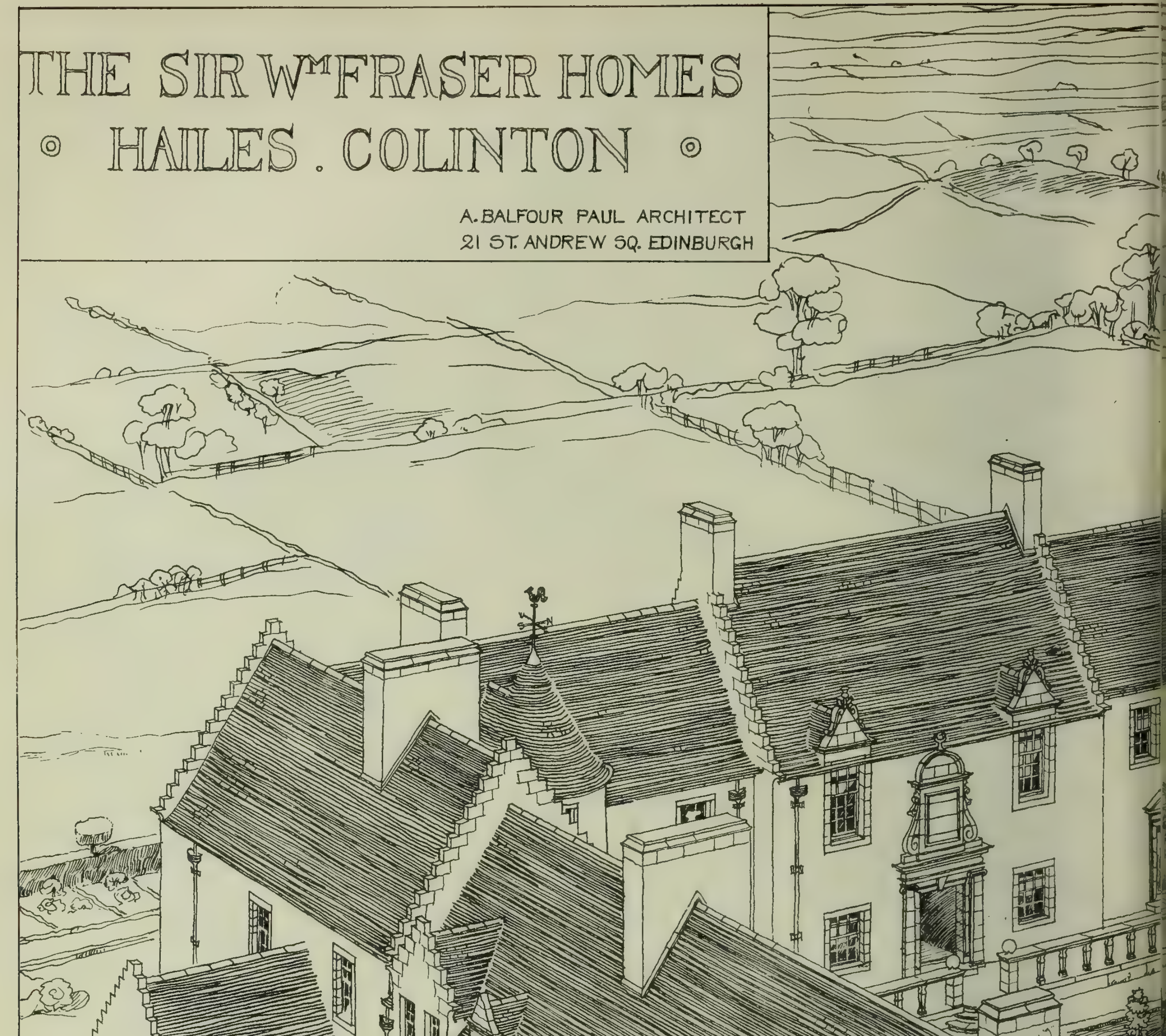


"PHOTO-TINT" by James Akerman 6 Queen Square London, W


The Norman Stair Turret
Christ Church Priory
National Gold Medal Drawing
Norman. Stair Turret. from Christchurch Priory.

"Photo-Tint," by James Akerman, 6, Queen Square, London W C

Studies of Architectural Detail by George Marples


THE SIR W^M FRASER HOMES
HAILES . COLINTON
A. BALFOUR PAUL ARCHITECT
21 ST. ANDREW SQ. EDINBURGH

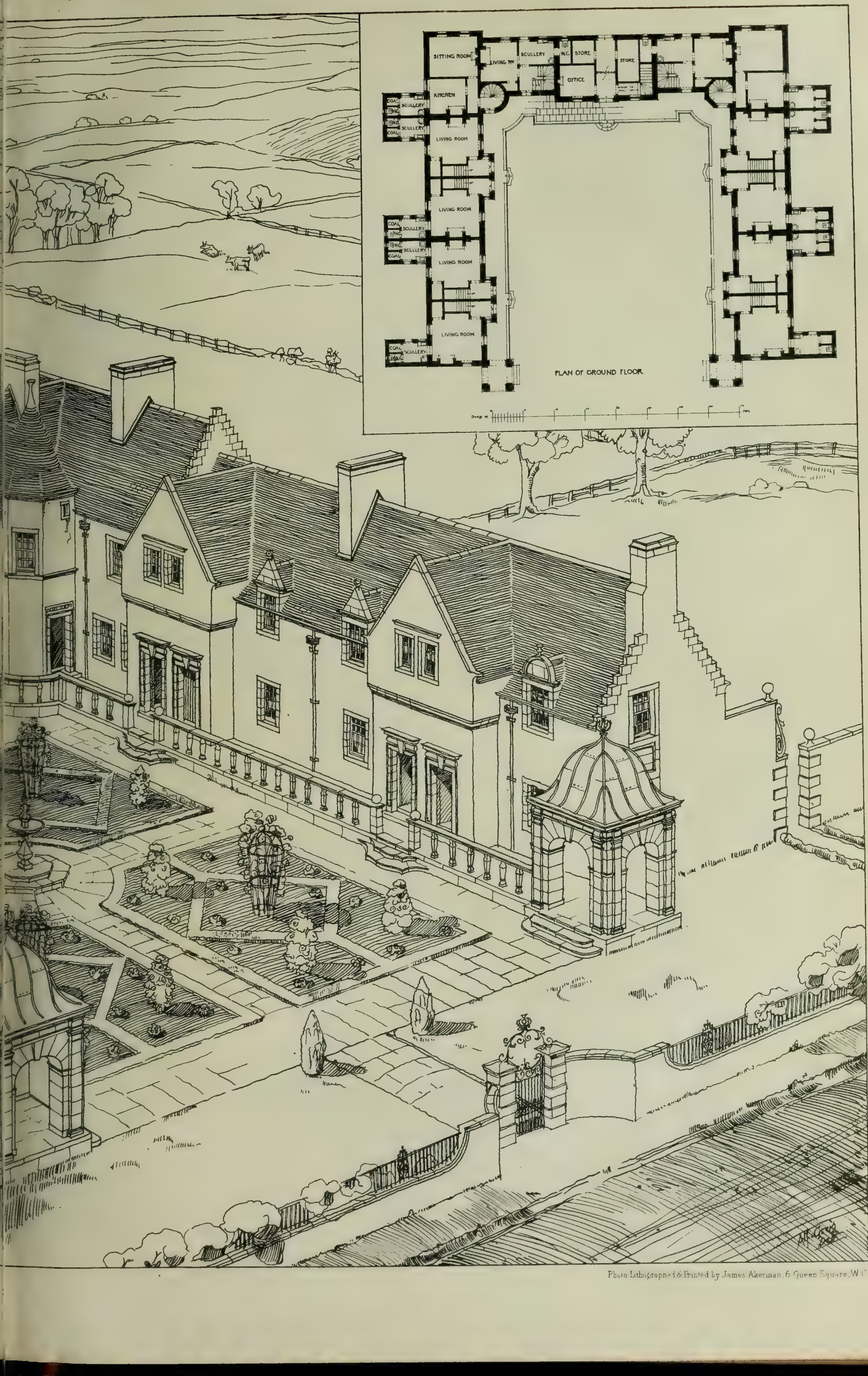
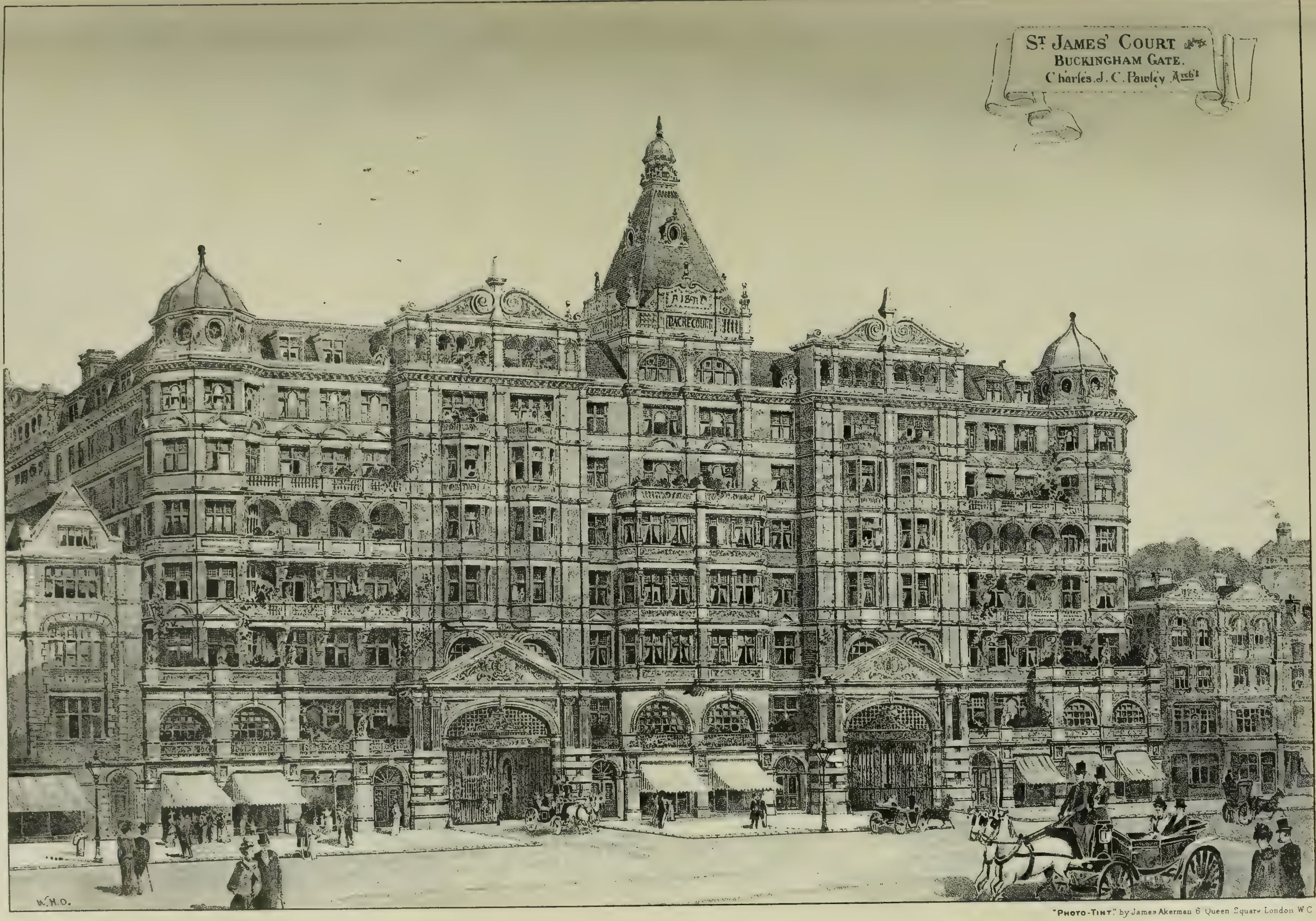


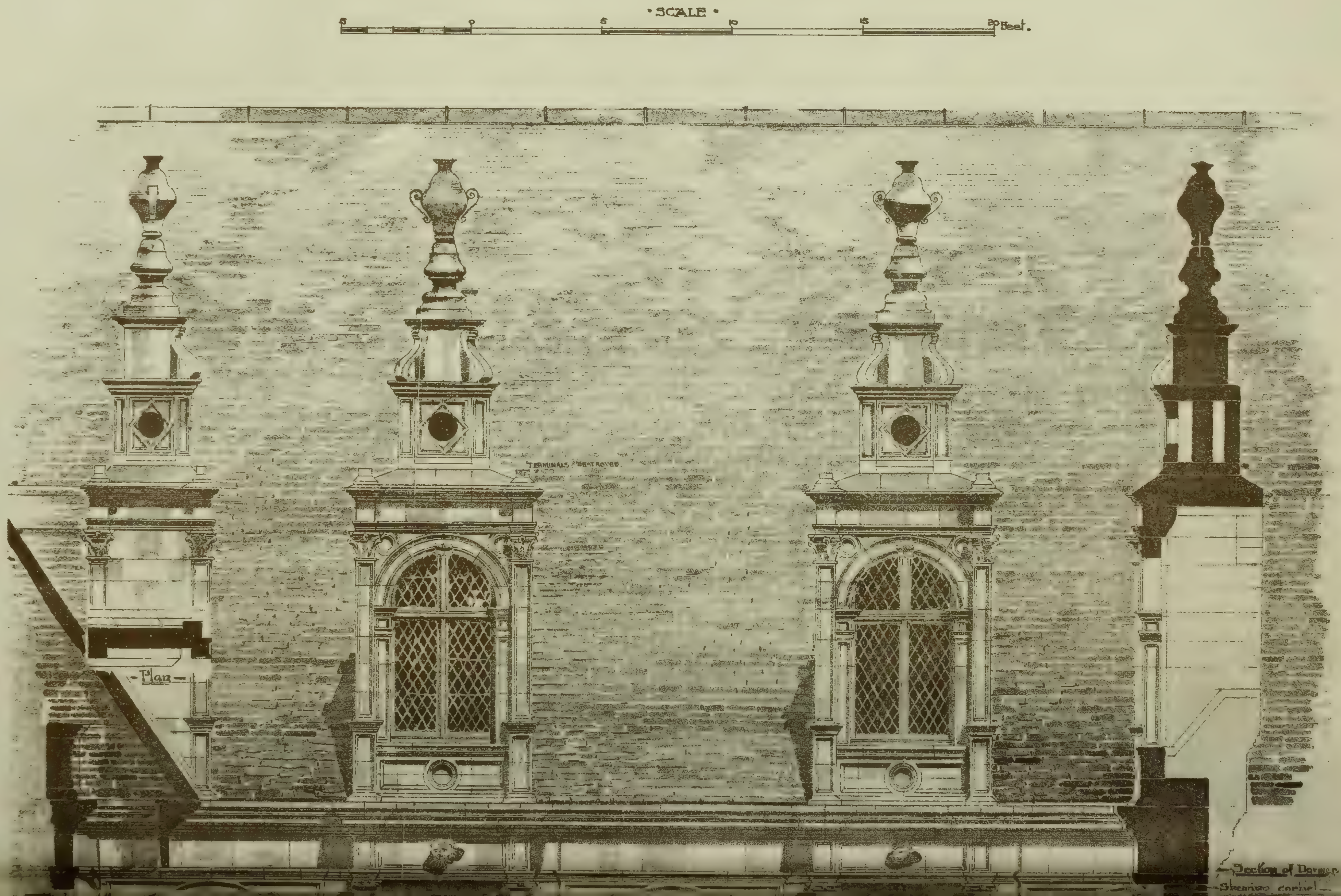
Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

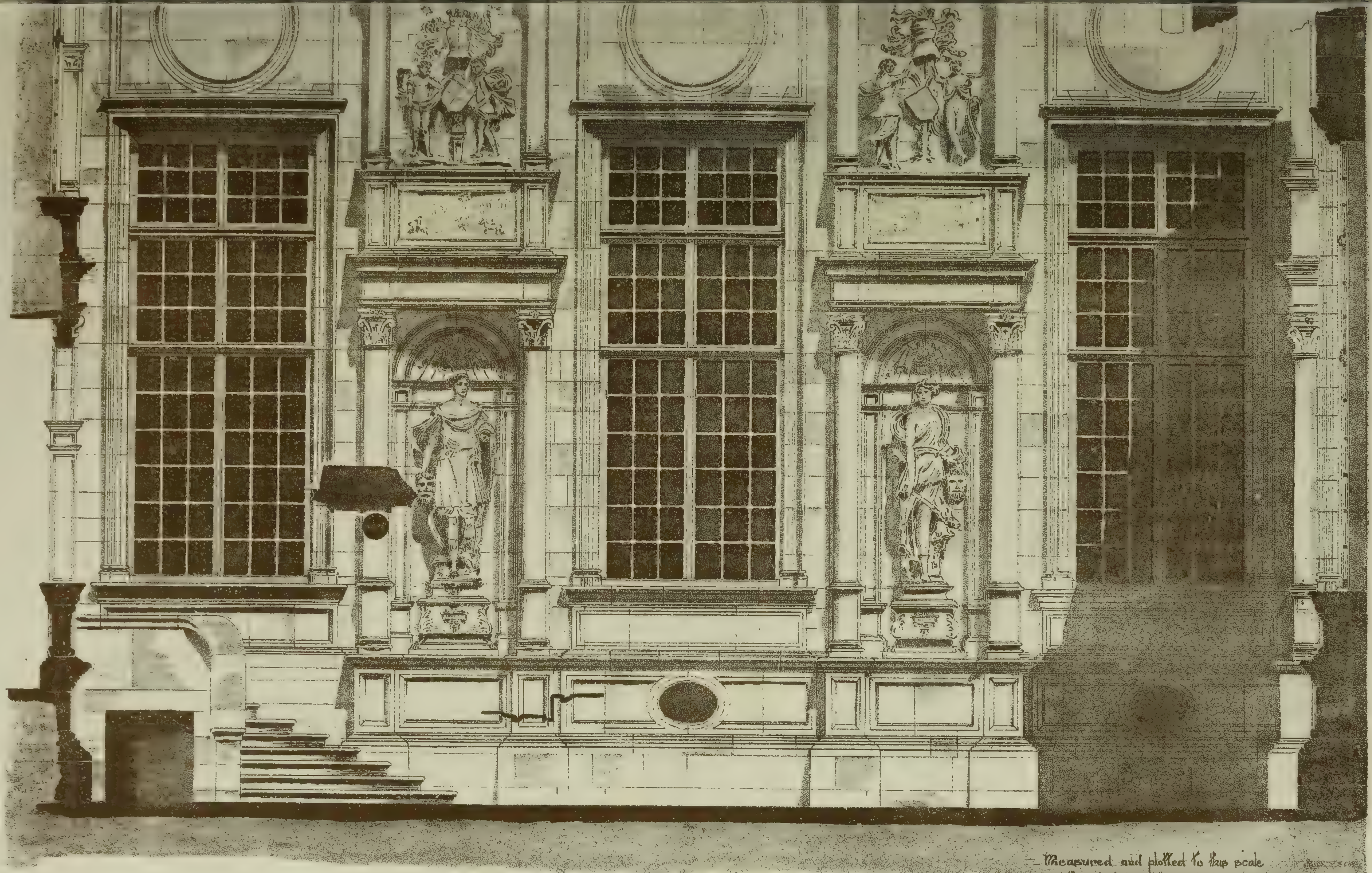


ST. JAMES' COURT
BUCKINGHAM GATE.
Charles J. C. Pawley Archt

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.

ANCIEN HOTEL DE VALOIS CAEN



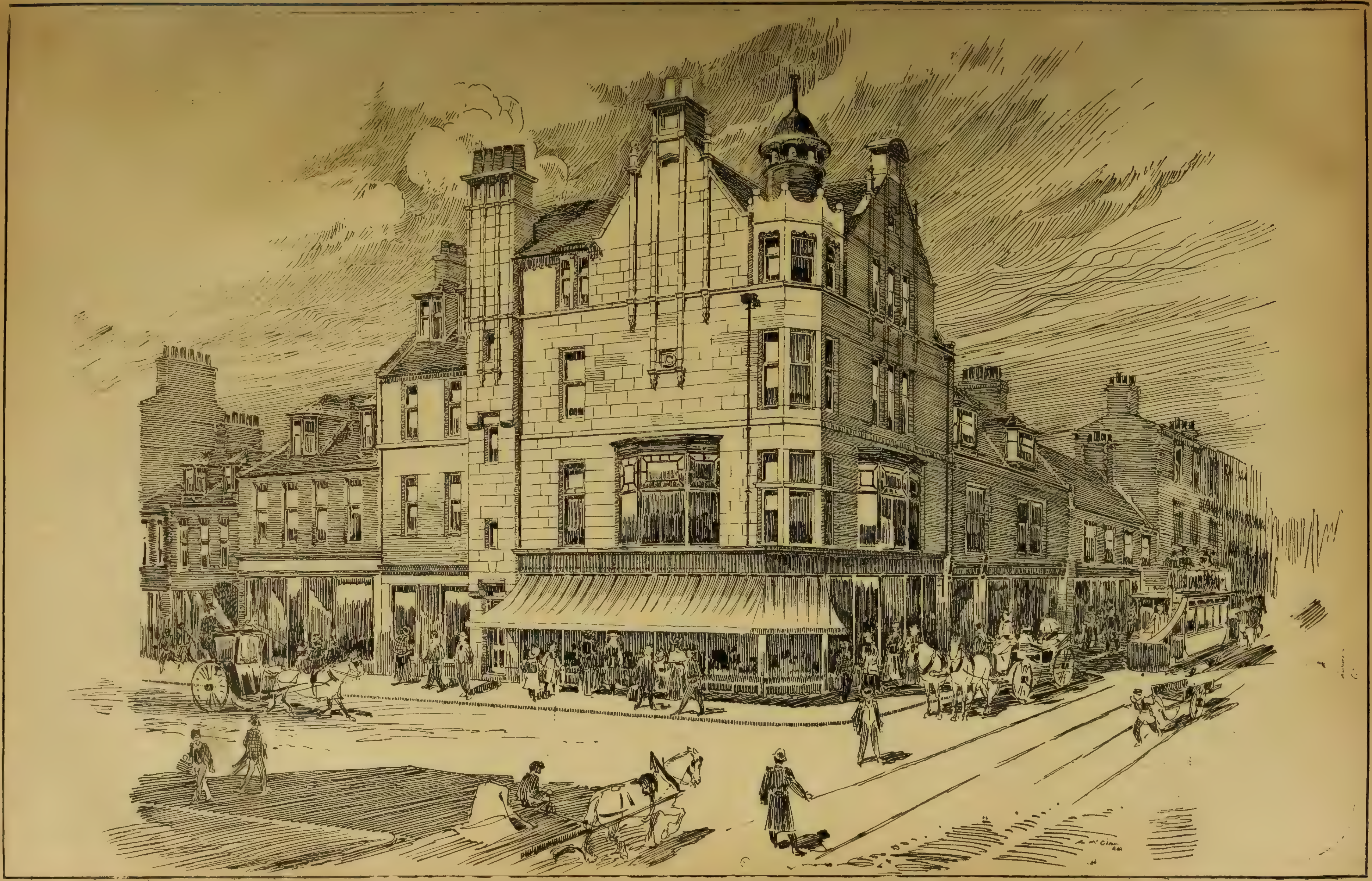


DETAIL OF SOUTH EAST ELEVATION

Measured and plotted to this scale
on the spot from the scaffold erected
for restoring the building July 1898
Redrawn and completed. November 1898
G Salway Nicol

DRAWN BY G SALWAY NICOL

"PHOTO-TINT", by James Akerman 6 Queen Square London W



DRAPERY WAREHOUSE, ABERDEEN.—Brown and Watt, *Architects.*

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXV. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., and LXXV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—H. N. and Co.—R. P.—M. Ry. Co.—E. S.—G. B. and L.—B. B. Co.—D. and Co.—J. K.—Cybele.—J. D. (Amsterdam).

Electric.—Rather behind the times, we should fancy. We should go to Rashleigh Phipps and Co., 102, Oxford-street, W., or G. E. Cockburn, 35, Great Pulteney-street, W.

R.—Nothing better than the "Manchester" Grate, for that.

Doubtful.—The affair is rotten to the core, in our belief, and you will do well to listen to no proposals for reconstruction.

Seven Years' Reader.—You cannot go to a better firm in your district than Roger L. Lowe, Farnworth, Bolton.

Hayseed.—A Yankee re-invention of a well known old English dodge; not much used nowadays here of course, because the need for it has passed, except in purely rural districts. No patent in it!

J. P.—Some of the really best modern domestic stained glass we have seen lately was made by Messrs. Ward and Hughes, Frith-street, Soho-square. We think they could do just what you want.

Peterhead.—We think not.

Builder.—Rubbish. Go to Nightingale, Albert Embankment, or W. H. Lascelles and Co., Bunhill-row, if you want really good English stuff that will stand.

H. Alford.—Very difficult people. Issue a writ. We have generally had to do so before we could get money out of them.

Nisi Dominus Frustra.—As the Court of Appeal has confirmed Lord Kyllachy's judgment, any further remarks on our part would have no practical result. We still uphold the views given in our article, and may again refer to the subject.

◆

The foundation-stone of St. Andrew's Mission Chapel, associated with the parish of St. John's, Truro, was laid on Tuesday week. Mr. Silvanus Trevail, F.R.I.B.A., is the architect.

The memorial-stone of a new Free Church was laid at Trumpington last week. Mr. Wren, of Cambridge, has designed the building, which has a porch and windows of Classic type. It is of white brick, and will comprise two rooms and the necessary offices. The cost of the structure is estimated at £500.

Intercommunication.

QUESTIONS.

[12277.]—**Chimney.**—I wish to know where I could find a description of a foundry chimney-stalk built in Monterey, in Mexico, under the superintendence of Mr. William Drysdale, of Bonnybridge, Stirlingshire. The stalk was completed in March, and is the tallest and, it is said, the handsomest in the Mexican Republic. A short notice appeared in the *Falkirk Herald*, being copied from the *Mexico Monterey Daily Globe* of March 14. I would like very much to know where I could find a description or notice of it, or, failing that, if I could procure the copy of the Mexican newspaper in which it appeared? How could I procure that Mexican paper?—Alex. Fraser, Jun., Neuck, Airth, Larbert, N.B.

REPLIES.

[12268.]—**Pine.**—I have tried to use Oregon pine for joiners' work, but it is so unequal in grain that it will neither take varnish nor paint well. Some parts are so hard that paint seems hardly to touch it; others will absorb all you put on. If it were not for this, the wood might be more used.—Kappa.

[12274.]—**Charge for Making Plans of Estates.**—I should make a charge on each plot; if there are several hundreds of plots, a charge of 10s. each may be remunerative, but in some cases it may be desirable to charge by time expended. No one rule would be applicable to every case, as sometimes in survey levelling operations calculation may be considerable; in other cases, it may be only a plotting out of the land. I should take the number of days upon which you were engaged on the work and ascertain what charge per lot would fairly meet this outlay—A. X.

[12274.]—**Charge for Making Plans of Estates.**—Ask at Surveyors' Institute, Great George-street, S.W., of the secretary, who would give you average scale.—Regent's Park.

[12275.]—**Scagliola Marble.**—Wm. Millar, the expert, and author of "Practical Plastering," speaks highly of it. You ought to get his book of B. T. Batsford, 94, High Holborn, W.C. Can be made *in situ* or at workshop. The temperature should be warm, free of damp and dust. The plaster of the strongest and finest in quality, and free of salines, of lumps, coarse grains. The glue water mixture made in small quantities, to suffice for the day, as it deteriorates. Glue tends to harden and gives a gloss, but best quality must be used, or subsequent dulness and decay, when exposed to moisture and damp air, may ensue. If to be done *in situ* on brick, the joints to be well raked out, and walls well wetted. This gives a good key, stops excessive absorption and saline effects on most bricks. Allow bricks to stand as long as possible, wetting at intervals—allows for saline exuding, and being washed off. The exudation may be hastened, or salts absorbed by brushing bricks with freshly-slaked hot lime. Allow this to dry, and then clean off by scrubbing with warm water and a coarse broom. If space permits, a batten and lathing is best preventive. Scagliola slabs screwed to plugs or battens are protected from saline and damp. On iron:—Core surrounded with wood skeleton and strong laths, or painted wire lathing. Two wood templates are cut equal to upper and lower diameters of columns—one fixed at top and bottom of shaft. Groundwork then ruled fair, with a diminishing floating rule. This gives guide and equal thickness for the scag. Floating coat composed of best and strongest plaster, and gauged as stiff as possible with strong size-water, and take 12 to 20 hours to set. Floating brought out from lath in one coat. One-tenth part of well-washed hair is sometimes mixed with gauged plaster, surface carefully scratched with single-pointed lath to give key for scag, which is laid on in slices, and pressed and beaten with stiffish square-pointed gauging trowel, like margin trowel. Scag laid about ⅛in. fuller than the true outline, and, when set, surface worked down with a toothed plane. This is similar to cabinet-makers' veneer planes. The irons are toothed in various degrees of fineness, and set at an angle of 70°. If columns are fluted, half-round plane is required for flutes. As planing proceeds, outline tested with a rule. To obtain a greater cohesion between scag and floating, latter is brushed with soft gauged stuff just before pieces are laid, the scratching filled up at same time. When shaft is planed, the wood collars taken off, base and necking moulding previously cast, screwed into position, using plaster (coloured same as ground of marble) for joints. When dry, whole is stoned off and polished. Pilasters and other surface work done *in situ* executed by similar processes, &c., with several pages on framing, mixing colours, polishing, &c.—Regent's Park.

[12275.]—**Scagliola Marble.**—Consult any work on plastering. The scagliola can be secured to iron cores by forming a cradle round the core of "expanded metal" or metal lathing, with annular fillets fixed to the iron core, and the material is then applied the same way as with plaster. Write to Bellman, Ivey, and Carter, scagliola marble manufacturers, for particulars.—G. H.

[12276.]—**Timber Measurement.**—Table 4 of "Timber Trades Price Book," by W. Richardson, 1869 (Longmans), gives price per square of boards (exclusive of sawing) compared with that per 120 12ft. 1½ × 11, and 120 12ft. 3 × 9.—Regent's Park.

◆

Mr. Walter Crane's brief official career as Director of the Royal College of Art at South Kensington came to a termination last week with the close of the term. The appointment of his successor rests with the Duke of Devonshire.

Two side-light windows on the south side of the Congregational Church at Hallfold, Rochdale, have been filled with stained glass as memorials. One represents The Presentation in the Temple, and the other Christ's Charge to Peter. Mr. F. T. Curtis, of Messrs. Ward and Hughes, Frith-street, Soho-square, W., was the artist.

WATER SUPPLY AND SANITARY MATTERS.

Cantley.—The commissioners of the Cantley and Honingham drainage district have taken over the new pumping machinery which has recently been fixed at their mill. To suit the existing buildings, the engine is designed on the tandem principle, having a high- and low-pressure cylinder and condenser. The main crankshaft drives direct on to the vertical spindle of the pump, which is fixed at the bottom of a cast-iron casing resting in a brick well. The fan, which is 3ft. in diameter, is carried on a vertical spindle, supported on the top on a heavy cast-iron cross-girder. In the carrying out of the work, Major Kerrison represented the commissioners, Mr. Martin Folkes acted as consulting engineer, Messrs. Holmes and Sons, Ltd., supplied the machinery, and the necessary alterations to the buildings and new foundations were carried out by Messrs. Downing and Sons, of Norwich.

CHIPS.

The Dean and Chapter of Carlisle have placed the order for a new clock to be erected in the tower of the cathedral with Messrs. Wm. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne, who are now making the new clock for the town hall, for the mayor and corporation of Carlisle.

A short length of line was opened on Tuesday by the London and North-Western Railway Company, giving new and direct communication between Ashbourne and Buxton. It opens out Dovedale, one of the most charming districts of Derbyshire. The length of the line, exclusive of an old portion of the High Peak railway, is 13½ miles. There is a tunnel at the Ashbourne extremity, and a good many engineering difficulties have had to be surmounted.

On Monday morning one man was killed and seven were injured by the collapse of a roof and gable-wall at a common lodging-house in St. Mary's-row, Birmingham. The roof fell without warning on a number of lodgers who were sleeping in the attic, the probable cause being the inroads of dry rot in the timbers.

The Hambledon Schools, Henley-on-Thames, are being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators, and inlet panels, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A scheme for improving the Douglas Promenade is shortly to be submitted to the Douglas Town Council. It is proposed to build a new sea-wall, and thus widen the Loch and Harris Promenades over their whole length by 40ft. The estimated cost is £50,000, and it is contended that the increase in tramway royalties will more than cover the interest and sinking fund. The improvement will allow of electric traction on the tramways, and will permit of a more effective drainage system.

The rebuilding of Riddlesworth Hall, Norfolk (late the property of Sir Thomas Thornhill, Bart., and now belonging to Mr. W. N. L. Champion), which was destroyed by fire in February last, has been intrusted to Messrs. J. Youngs and Son, of Norwich, at a cost of £22,000, from designs prepared by Mr. Herbert Green, of Norwich.

The parish church of Inwardleigh was reopened last week. The tower has been replastered and the masonry repaired, and granite finials will be placed on the top. The foundations of the church have been taken out and renewed, and a new roof has been put on. The walls have also been replastered. The greater portion of this work has been carried out by Messrs. Petherick, of Hatherleigh. The church has been reseated in oak, and there has also been erected a new pulpit, reredos, altar-rails, tower screen, font cover, Communion-table, choir-stalls, new oak bosses, crests on the wall-plates, and chancel, and the font has been restored. The south and west doors are also new. All the oak work has been done by Mr. Reid, of St. Sidwell's, Exeter. The cost of the work will be about £1,400.

Croydon is to have a second theatre. Mr. Ronald Grahame has acquired the old Royal. The exterior has been greatly improved, and the front elevation is of a bold and imposing character. The scheme of decoration is in the style of the Italian Renaissance. The ceiling and proscenium are in modelled plastic work, and the two rows of pit stalls, circle, and the side boxes are upholstered in rich old gold, while the elegant tableaux curtains are made of figured art velvet of choice design.

The new theatre at Ealing is rapidly approaching completion, and will be one of the most comfortable and elegant structures of its class near the Metropolis. The contract for gas, heating, electric lighting, telephones, &c., has been intrusted to Mr. G. E. Cockburn, of 35, Great Pulteney-street, W., who has just completed the wiring of the Acton Free Library, under the direction of Mr. Maurice B. Adams, F.R.I.B.A., architect.

LEGAL INTELLIGENCE.

Screens at the West Pier Kiosk, Brighton.—Last week, at the Brighton County-court, his Honour Judge Martineau heard the remitted action, Oswald Strudwick Godard, builder and shopfitter, Hampton-place and Regent-row, Brighton, v. Tom Fryer, trading as Gordon and Co., West Pier, Brighton, and elsewhere. Mr. John Laidman appeared for plaintiff, and stated that the claim was for £30 18s. 8d. for work done for defendants, who traded under the name of Gordon and Co., on the Brighton West Pier and other places, and £19 10s. had been paid into court. There was a counterclaim of £6 for non-completion of contract within the stipulated time. The real crux of the case was an item of £7 10s. for erecting two screens on the West Pier as per estimate. There was a penalty of non-completion of the work by March 24, and the work was completed by the 25th, one day late, for which his client had allowed 10s. The screens were fitted by the 25th, but it appeared that the pier-master did not consider the wooden supports strong enough to withstand the weather, and the screens accordingly had to be taken down and re-fitted with iron supports. The remainder of the items, after the £7 10s., were for extras, by which was meant the extra work incurred in re-fitting the screens and other work. An item of £1 5s., which headed the account, was for work done last December. Mr. Laidman, having gone through the correspondence relating to the matter, proceeded to examine his client upon the various items in the bill. Mr. Pearson was about to address his Honour, when the judge told him he was going to find that wood stays were all that were stipulated for in the contract. When defendant found the work was not properly fixed, he had iron stays put and the screen refixed, and that was an alteration. If he changed the material, surely he must pay for the material. Plaintiff had put up better and stronger brackets, and had not apparently charged for them. Defendant had chosen to depart from the contract, and any delay involved by that departure ought to be paid for by him. Apart from that, he was entitled to recover for any delay; but there was great difficulty in apportioning. Defendant should have been content with simply bolting, which he did not think would take thirteen days. Iron stays had to be made, and this involved delay; but he had no clear evidence to show how much delay was thus occasioned. After making all allowances, he was of opinion that he could allow defendant for three days. Judgment would be for plaintiff for £29 17s. 8d. on the claim with costs, and for defendant for £1 10s. on the counter-claim.

The N.A.P. Window Company, Limited.—A winding-up order having recently been made against this company, the statutory meetings of creditors and shareholders were held on July 28 at the Carey-street offices of the Board of Trade. Mr. A. S. Cully, Senior Assistant Official Receiver, presided. The chairman reported that the company was registered in November, 1893, with a nominal capital of £30,000, divided into 10,000 preference and 20,000 ordinary shares, and was formed to acquire certain patent rights for the manufacture of safety windows from Mr. William Youlten. Nothing appeared to have been done during the first two years after the incorporation of the company, owing to the illness of one of the promoters, but Mr. Youlten and another gentleman carried on the business, and they expended about £8,000 in developing patents. By a contract dated July 10, 1896, the company purchased the patents, plant, stock, &c., for £20,000, and Mr. Youlten was appointed managing director at a salary of £500 a year. The purchase consideration was satisfied by the issue of 15,000 ordinary and 3,000 preference shares fully-paid up, and £2,000 in cash. A prospectus was issued, but £5,567 only was subscribed. Attempts were subsequently made to raise further capital, but without success. In June, 1897, debentures for £1,000 were issued, but these were paid off in September, 1898. In November, 1898, debentures for £20,000 were created, and of these about £3,085 were issued for cash, 16,000 of them being given as security for a previous advance of £2,000. In June, 1898, an attempt was made to reconstruct the company, and the new N. A. P. Window Company, Limited, was registered with a capital of £200,000. The new company was to purchase the business of the old company for £150,000, but the flotation proved abortive. Very little was subscribed, and although there was a large amount of capital underwritten, one of the directors of the new company declined to go to allotment unless the underwriting was guaranteed. The amount subscribed by the public was returned, and that practically ended the matter, as a winding-up order followed, and a debenture-holders' action was commenced. A receiver was eventually appointed, who was now carrying on the business on behalf of the debenture holders. The company traded throughout at a loss, which was stated to be due to the fact that it became necessary to spend large sums on advertising and in management during the development and introduction of the windows constructed under the patents. The assets of the company were valued at £8,838, and were subject to claims on debentures amounting to £4,816, leaving net assets £4,022 against unsecured liabilities amounting to £8,000 or £9,000. Mr. W. Youlten, the managing director, said it was proposed to submit a scheme for the reconstruction of the company, but at present he could not give any definite idea of the details. After some discussion the meeting was adjourned until August 25 next, in order that a scheme might be submitted.

The Affairs of a Winsford Builder.—At Crewe County-court, before his Honour Judge Yate-Lee, Mr. J. H. Cooke applied on behalf of Henry Hulse, lately in business as a builder and contractor, for his discharge from bankruptcy. Mr. T. Bullock, the Official Receiver, had placed his report before the court, in which he stated that the debtor had not kept such books as would have shown his financial position at any time, and, further, that he had contracted debts after he was insolvent. The amount realised by the bankrupt's estate was not given; but Mr. Cooke stated that the debtor could not make up the sum to 10s. in the £. No extravagance was suggested against the debtor; he had conducted his business with the intention of paying everybody, and soon after he found out his position he immediately filed his petition. His bankruptcy was due to unfortunate circumstances and keen competition. Much sympathy, however, was felt for him in the district, and he had been appointed surveyor to the urban district council. The Judge granted the discharge subject to two years' suspension.

Kennington Oval and the Building Act.—At Lambeth, George Davenport, a builder, of Warner-road, Camberwell, appeared on Monday to answer an adjourned summons taken out by the London County Council, who complained that he, on or about May 12, at Kennington Oval, unlawfully set up a structure to which part 7 of the London Building Act, 1894, applies, without having obtained the license required by the Act. Mr. Thomas Chilvers, from the Solicitors' Department of the Council, said the proceedings had reference to a stand which was intended for the accommodation of spectators at the forthcoming test match between Australia and England. It was intended to accommodate between 400 and 500 people. No application was made to the Council for a license in connection with the erection of the structure; but the fact that the stand had been erected was brought to their notice, and an examination of the structure was made by one of their surveyors, who was of opinion that it was not fit for the purpose for which it was intended. The summons originally came before Mr. Hopkins, who adjourned it for three weeks upon the defendant giving an undertaking that the stand should not be used in the mean time. Since then the stand had been made in conformity with the Act, and a license would now be granted. What he wanted to point out was that it was very important that such stands should be put up in a proper way. Mr. Francis agreed that it was important. Mr. Armstrong said he understood that the Council would be satisfied with a penalty of 40s. and 42s. costs. The defendant would be prepared to pay that sum. Upon learning from Mr. Chilvers that he would be content with a settlement of the case on the terms suggested by Mr. Armstrong, Mr. Francis ordered the defendant to pay a fine of 40s. and 42s. costs, and expressed a hope that the stand would be ready by the 14th.

Dock Rates and Cement Barges.—Burham Brick, Lime, and Cement Company, Limited, v. London and India Docks Joint Committee.—The plaintiffs in this case, tried on Monday in the High Court of Justice, Queen's Bench Division Commercial Court, before Mr. Justice Mathew, were owners of sailing barges which were employed from time to time in carrying cement and other goods from the Upper Medway to be discharged into ships lying in the defendants' docks, and in receiving goods from ships lying in such docks. From the commencement of the present century until Jan. 1, 1899, the defendants or their predecessors in control of the docks have not charged or claimed to charge any dock rates on sailing barges engaged in the manner above-mentioned. Since Jan. 1, 1899, the defendants have required sailing barges, including the plaintiffs' barges, coming from outside the Port of London to pay certain rates, although the barges were only engaged as aforesaid. The plaintiffs alleged that such charges were illegally levied, and they claimed in this action the return of money paid for such charges under protest. The defence to the action was that the exemption from dock rates in the various Acts regulating the defendants' undertaking was in favour of "all lighters and craft" so long as the same were "*bona fide* engaged in discharging or receiving any goods or ballast to or from on board any ship or vessel." The defendants contended that the true construction of the words "all lighters and craft" in the exemption clauses of the various dock Acts did not include the plaintiffs' sailing barges, which were, in truth, coasting vessels. The earliest statute dealing with the exemption is 39 Geo. III., c. 69, which by section 137 provided that "this Act shall not extend to charge with the said rate or duty of 6s. 8d. per ton hereinbefore granted any lighters or craft entering into the said docks, or basons, or cuts, to convey, deliver, discharge, or receive ballast or goods to or from on board of any ship or ships, vessel or vessels." A similar provision is to be found in various other Acts relating to the docks, and in particular in 37 and 38 Vict., c. 178, section 136, and 45 and 46 Vict., c. 90, 26. Mr. Justice Mathew gave judgment for the plaintiffs. Having referred to the Acts of 1799 and 1882 and read the material sections, he said that, according to the perfectly plain language of these statutes, the exemption from the payment of dock rates existed in the case of lighters engaged in the loading and unloading of ships. The exemption did not, however, apply to the case of a barge making an independent voyage and discharging her cargo at the docks for the purpose of transshipment. It was quite clear that the plaintiffs in this case were within the exemption, and were, therefore, entitled to judgment.

Action by a Liverpool Architect.—Hornblower v. Brocklebank.—This was an action by Frederick W. Hornblower, architect, of Liverpool, against Thomas Brocklebank, of Irton Hall, Cumberland, to recover £259 as fees for the preparation of plans. The defendant denied liability on the ground that plans were to be prepared for buildings not to cost more than £1,000, but the plans sent in were useless, as they were for buildings to cost about £4,300. For the plaintiff it was stated that the defendant, a son of Sir Thomas Brocklebank, has a large estate in Cumberland, and, being desirous to erect a farmhouse and outbuildings on one of his farms, he consulted the plaintiff in January, 1898. The defendant, it was admitted, said the buildings were to cost about £1,000, and the drafting of plans was commenced. Afterwards the plaintiff saw him at his offices in Bixteth-street, Liverpool, and explained that, as he (the defendant) desired the farmhouse to be built in a certain manner, the cost would be greater. Plaintiff completed the plans, and tenders were invited, these ranging from £4,300 to £5,300; but the defendant said he never intended to have such expensive buildings, and, as the plans were useless to him, he refused to pay the fees, which were 2½ per cent. on the lowest tender and 2½ per cent. for taking out quantities (1¼ of this latter sum going to the surveyor employed by the plaintiff). The plaintiff in his evidence maintained that some time after January he told the defendant the buildings could not be erected at the sum first mentioned. In cross-examination he admitted that the 2½ per cent. for the plans should include the taking out of a specification, but this he did not take out. The defendant stated that he told the plaintiff at the interview he wanted plans for a building to cost about £1,000. The plaintiff never informed him that the cost would run into several thousands, and it was not until the tenders were sent in that he learned that fact. The rent of the farm was £120 a year, and he would never dream of putting such expensive buildings on the land. Mrs. Brocklebank corroborated the account of the interview, when the defendant said he did not wish to spend more than about £1,000. Towards the close of the case Mr. M'Call admitted there should be deductions from the claim; there should be an allowance of 2 instead of 2½ for the preparation of the plans, and a further deduction from the amount charged for the taking out of the quantities. The jury found for the plaintiff for £75. As there had been paid £100 into court, his Lordship gave judgment for the defendant.

Affairs of a Chichester Builder.—Re William Edward Slade, Oving-road, Portfield, Chichester.—Debtor said he started in a small jobbing business about 18 years ago with no capital. He began speculating about four years ago. He lost money at it, and also over a public-house he subsequently took in Chichester and carried on for about a couple of years. He had conducted other building operations at a loss, and had given a bill of sale on his stock-in-trade and furniture. He had not been able to pay since August, 1897, but had gone on in the hope of things coming right in the end. He was sorry he did not call his creditors together two years ago. The examination was concluded, subject to the signing of the shorthand notes.

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The Local Government Board have sanctioned the borrowing by the corporation of Liverpool of the sum of £13,500 for the purpose of erecting dwellings for the labouring classes in Dryden street and Rachel-street, according to a scheme which has been prepared by the deputy surveyor, Mr. F. T. Turton.

The elaborate scaffolding which has been erected on the roof of the Athenæum Club is the prelude to the building of another story. The addition will not detract from the appearance of the original structure, designed by Decimus Burton in 1830. Mr. T. E. Collcutt is the architect.

Our Office Table.

Her Majesty's Office of Works have issued a regulation that all articles for domestic use supplied under contract for the Public Departments, the Houses of Parliament, and such of the Royal palaces as are under their charge, shall be made with leadless glaze. Earthenware, stoneware, and glazed bricks used for sanitary or architectural purposes, have to be obtained as required by the surveyors of the department. It has been found impossible at the present time to insure an adequate supply of these articles made with leadless glaze; but H.M. Office of Works are making inquiries with a view to arrangements which will effect this object.

The annual meeting of the Society of Art Masters commenced on Monday in the lecture theatre of the Royal College of Art, South Kensington, under the presidency of Mr. Walter Scott, of Norwich. The report of the Council congratulated the members on the distinction conferred on the society by the acceptance of the honorary presidency by the Prince of Wales, and referred to various recommendations which had been submitted to the Lord President of the Council, in view of impending legislation as to the desirability of appointing persons qualified by experience in art teaching as inspectors of schools of art; the distinctive treatment of such schools in the reorganisation now being effected; the retention by the central authority of its control as an examining body, and of its veto on decisions affecting the schools; the importance of adequate art representation on the proposed consultative committee; the full recognition and maintenance of teaching certificates; and the necessity for increased grants. Mr. Walter Wallis, of Croydon, was elected chairman of the society for the ensuing year, and Mr. F. Shelley, of Plymouth, was appointed vice-chairman. Mr. W. H. East, of Dover, and Mr. C. Stephenson, of Bradford, were elected to serve on the council in the place of retiring members.

When Lord Llandaff's Royal Commission on the water supply of London comes to make its report in the autumn it is extremely probable that it will be found to be agreed on the necessity for a separate and additional source of supply, in Wales or elsewhere. The commission might have reported in this sense immediately, but they prefer to wait and see what happens in the matter of the water supply during the late summer, and base their recommendations as to the additional supply upon that. But their report will only be affected in degree by this delay. The commissioners are, we hear, convinced that a new source of supply will be required by the time that it can be provided. To this extent, of course, the County Council will be justified. The problem of control is a more difficult matter.

Municipal bodies and others charged with the control of tramways will do well to note an extraordinary occurrence which took place on Sunday evening on one of the Dublin electric tramcars. A London tourist was travelling on the top of a car coming from Clontarf to the city, and being desirous of alighting he asked the conductor, who was collecting fares from the outside passengers, to stop the car. The conductor told him to pull the cord of the bell, but the passenger in error pulled the rope attached to the trolley, which being thus displaced struck the span and guard wires, breaking them, and causing the broken ends to fall amongst the passengers on the car. Owing to the contact of those wires with the main wire the electric fluid was conducted down, and three passengers were injured, two very seriously. Mr. Mahony, the city magistrate, in dismissing the charge brought next day against the passenger of unlawfully interfering with the wires, very properly said that the tramway company were to blame in not having a man to remain constantly in charge of the trolley ropes. Tramway companies generally seem to seek to cover the consequences of their own neglect by prosecuting their victims!

Last week the Hawick Town Council arranged the programme for the twenty-fifth annual Congress of the Scottish Sanitary Association to be held at Hawick on September 6th and succeeding days. The business meeting will be held on the first night. Next day (Thursday, 7th September), the presidential address will be delivered by Mr. Kelso, chief sanitary inspector, Paisley. Papers will be read, including one by Dr. Macleod on "The Sanitary Progress of Hawick during the last Fifty Years," and another by Sanitary Inspector Macdonald on "The Inspection of Meat and Dairies." There will be a drive to Branxholme on Friday afternoon, provided by Hawick Corporation, in which about 200 delegates and others are expected to participate. There will also be a dinner. On Saturday there will be a drive to Jedburgh, Dryburgh, and Melrose Abbeys to occupy the whole day.

An application has been made by Mr. W. G. R. Sprague, accompanied by two plans, dated July 14, 1899, for permission to form a roof garden over the auditorium of the theatre which is being erected for Mr. Charles Wyndham in Charing Cross-road. The garden will be covered in with a construction of iron and glass, and access to it will be obtained by a lift, the gallery staircases being carried up to the roof for use as emergency exits. The garden will only be used during the time the public are in the building by the occupants of the stalls and dress circle, and then only between the acts.

Last week the County Road Board of Elginshire took an opportunity of inspecting a new machine, worked by steam-power, for paring and dressing the edges of roads. Mr. Grant Peterkin, of Grange, convenor of the county, and other members were present, and Mr. Hogg, county road surveyor, the inventor of the machine, was in attendance. The machine dressed in a perfect manner upwards of a quarter of a mile of road, both sides being done in twenty minutes. The portion trimmed off ranged from 6 to 15in. broad, and from 1 to 10in. deep. The only revolving tool used in the machine is a steel cutting-wheel, about 2ft. in diameter, which not only pares the border, but cuts all roots that come in its way. Strength, weight, and ample propelling power are the leading features of the machine, and they provide the only conditions, says the inventor, under which all the various states of road-edges can be successfully pared and dressed by one operation. The machine is attached to a traction engine, which is used for steam-rolling purposes. It has already dressed about 100 miles of roads, and it is expected that upwards of 300 miles can be pared and dressed annually. The members of the Road Board present expressed themselves greatly pleased with the work, and congratulated Mr. Hogg on the success of his contrivance.

A deputation representing the United Property Owners and Ratepayers' Association waited on the Lord Chancellor last Friday urging the necessity of reducing the time within which property owners could regain possession of houses under the law of ejectment. The deputation proposed that after due notice to quit had expired the magistrates should order possession to be given within seven days instead of twenty-eight days as at present. The Lord Chancellor, in reply, said there was a grievance, which he promised to consider.

A Treasury Minute was issued last Friday on the housing of the University of London in the present Imperial Institute building. The accommodation offered consists of the eastern and central portions of the main block, including the principal entrance, vestibule, and staircase, and the Great Hall; subject to occasional use by the Institute of certain portions of the central block when not required by the University, under regulations approved by the Chancellor of the University, and subject also to certain reservations in favour of the Government of India. Also a portion of the upper floor of the inner block of building running east and west; and the temporary structure now standing in the south-eastern court. This offer, which provides much more space than the present building in Burlington Gardens, has been accepted by the Senate of the University. The amount required under the supplementary estimate which accompanies the minute is £65,000—namely, £55,000 for purchase, £7,000 for structural alterations, £1,000 for maintenance and repairs, £600 for fuel, lighting, &c., and £1,400 for furniture.

An alarming condition of affairs prevails, it is said, at the church of St. Mary-le-Bow. Several great cracks have developed, consequent, it is alleged, on the subsidence of the ground owing to the works of the Central London Railway. On two sides large ruts run from the floor to the ceiling. In one of these it is even possible to insert one's finger. On the west side of the church there is another crack running up towards a stained-glass window, while at the base of the tower there is a lurch of about 7in., which means, it is said, an incline of about 2ft. at the spire. A conference was held last Friday at the church by the Church Fabric Committee, a body appointed by the vestry, the ecclesiastical authorities, the patron of the living, and the aldermen of the three wards in which the church is located —namely, Bread-street, Cheap, and Cordwainer. The rector presided, and amongst those present were Archdeacon Sinclair, Mr. Deputy Ashby, Mr. C. Innes (surveyor to the parishes), and the clerk to the vestry. It was decided to obtain the opinion of an engineer, and for this purpose the meeting was adjourned, it being understood that the committee would be further convened on the engineer consulted presenting his report.

Sir John Taylor, K.C.B. (of her Majesty's Office of Works), and Mr. Thomas Blashill (lately architect to the London County Council) presided last week at a series of fire tests undertaken by the British Fire Prevention Committee at their Regent's Park Station. The strictly limited company of visitors included distinguished representatives from the War Office, Admiralty, and other Government departments, as well as from the London County Council, and the great insurance companies. The tests, which were conducted by Mr. Edwin O. Sachs (chairman), Messrs. Max Clarke, F. Hammond, Ellis Marsland, and Robert Mond, included some interesting investigations with "non-flammable" wood, "fire-proof" glass, and a ceiling of slag wool, and a number of very important results were obtained. The object of the test with non-flammable wood was to ascertain in a reliable and independent manner whether thin boards would sustain or spread flame when in contact with fire of such high temperatures as 1,000° Fahr., for terms of five, ten, or fifteen minutes respectively. The "fire-proof" glass both in skylights and windows was to show its resistance under a fierce fire increasing to a temperature of 1,800° Fahr., water being applied during the tests, which lasted thirty and forty-five minutes respectively. The slag wool ceiling was to withstand a fire increasing to a temperature of 2,000° Fahr. for an hour. The report embodying the important results of these tests will be issued in due course.

The length of railways in Russia open for traffic on March 1 (13), 1899, amounted to 44,619 versts, or about 29,700 miles, but only to the extent of 8,098 versts were the lines double. Of the 44,619 versts 2,430 are in Finland and 42,189 subject to the control of the Russian Ministry of Public Ways. Of these latter 27,622 versts, of which 6,525 are double, belong to the State, 14,126 versts, including 1,483 double, belong to railway companies, and 441 are special. The lines in course of construction amounted to 9,141 versts—namely, 1,476 by the State Railway Board, 2,963 by the Siberian Railway Board, 295 Transcaspian by the War Department, 4,374 by railway companies, and 33 special. Some of these lines are partly in use. In addition, the construction of 2,751 versts had been decided upon—178 by the State Railway Board, 2,491 by railway companies, and 82 special.

CHIPS.

A large memorial clock is to be erected in the Osmaston-road church, Derby, which will have three 6ft. illuminated dials, and strike the hours and chime the quarters. The work is being carried out by John Smith and Sons, Midland Clock Works, Derby.

The Earl of Wemyss intends, to-day, to ask the House of Lords to affirm "That it is desirable that models of all public buildings of importance that are about to be erected at the public cost should be made and publicly exhibited, and that this is more especially to be desired at the present time."

The new fire-station in High-street, Lewisham, was opened by Mr. H. R. Taylor, the vice-chairman of the Fire Brigade Committee of the County Council, yesterday afternoon.

The health committee of the Keighley Corporation have selected Mr. John Foy, of Keighley, for the post of additional assistant sanitary inspector for the borough.

The reconstruction of Highgate Archway, which has been much delayed, is now rapidly progressing, the piers and girder work having been finished on the London side, and a start made to demolish the upper part on the Middlesex side.

LIST OF COMPETITIONS OPEN.

Crystal Palace—Bandstand (Assessor)	30gs., 15gs., 7gs.	W. Gardiner, Sec., Crystal Palace Co., Sydenham, S.E.	Aug. 8
Watnall Chaworth and Watnall Cantelope—Sewerage Schemes		C. J. Spencer, Clerk, Public Offices, Basford, Notts	,, 17
Kircaldy—Infectious Diseases Hospital, Fosterton Farm	No premium	Alexander Beveridge, District Clerk, Kircaldy	,, 17
Wharfedale—Isolation Hospital	£30 (merged), £15	C V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Northfleet—Schools (750)	15gs.	Fredk. Mitchell, Clerk, 49, Windmill-street, Gravesend	,, 4
Dumfries—Public Library		John Grierson, Town Clerk, Dumfries	,, 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	,, 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	,, 16
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	,, 30
Dunoon, N.B.—Sheriff Court House (£5,000) and Police Buildings (£3,500)	£30, £20	M. Sinclair, County Clerk, Lochgilphead	—
Beeston—Church and Sunday Schools		C. Nichols, St. John's-grove, Beeston, Notts	—
Parsonstown—Water Supply (6,000 population)		H. Barlow, Clerk, Town Hall, Parsonstown	—
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—

LIST OF TENDERS OPEN.

BUILDINGS.

Horfield—Baptist Church and Classrooms	Building Committee	Milverton, Drake, and Pizey, Architects, Baldwin-street, Horfield	Aug. 5
Boharm, N.B.—Repairs to Smithy & Steading at Cummingston		The Factor's Office, Keith, N.B.	,, 5
Lisnaskea—Five Labourers' Cottages	Rural District Council	J. O'R. Hoey, Clerk, Rural District Council, Lisnaskea	,, 5
Chard, Somerset—Shops and Premises, Fore-street	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect Chard, Somerset	,, 5
Egremont—Shop and Warehouse, South-street		J. S. Stout, Architect, Gilfoot, Egremont	,, 5
Ipswich—Additions, Borough Fever Hospital	Public Health Committee	E. Buckham Borough Surveyor, Town Hall, Ipswich	,, 5
Buckland St. Mary, Somerset—Additions to Castle Inn	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard, Somerset	,, 5
Clifton—Church-room		George Horn, Surveyor, Wren Park, Shefford, Beds	,, 5
Friarton, Perth—Gasworks	Gas Commissioners	A. Gillespie Engineer, 34, St. Enoch-square, Glasgow	,, 5
Axminster, Devon—Additions to Trout Inn	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard, Somerset	,, 5
Richmond—Stabling, &c.		J. H. Brierley, A.M.I.C.E., Boro' Surveyor, Town Hall, Richmond	,, 5
Burntisland—Secondary School	Burgh School Board	Robert Little Architect, 4, St Brycedale-avenue, Kirkcaldy	,, 5
Hawkchurch, Somerset—Alterations to Old Inn	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard, Somerset	,, 5
Trimdon—Primitive Methodist Church		The Rev. J. Richardson, Thornley, R S.O.	,, 5
Caton—Reconstructing Roof of Kiln at Lunesdale Works	Lunesdale Brick and Tile Co.	C. Walker, Secretary, 11, Cable-street, Lancaster	,, 5
Chard, Somerset—Reroofing the George Hotel	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard, Somerset	,, 5
Treorchy—Six Workmen's Cottages, Ynyswen-terrace		Jacob Rees, Architect, Hillside, Pentre	,, 5
Tonbridge—Five Villas	R Hayward	Neve and Son, Estate Agents, 1, Bank-street, Tonbridge	,, 5
Chard, Somerset—Reroofing Bonded Stores	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard, Somerset	,, 5
Keighley—Residence, &c., Holycroft		W. H. and A. Sugden, Architects, Keighley	,, 7
Abertillery—Additions to Infants' School	Aberystwith School Board	R. L Roberts, Victoria Chambers, Abercarn	,, 7
Ushaw Moor—Wesleyan Chapel		J. Walton Taylor, F.R.I.B.A., 31, Westgate-road, Newcastle	,, 7
Hindley—Greenhouse, Leyland Park	Urban District Council	Stephen Holt, Clerk, Council Offices, Hindley	,, 7
Ulverston—Bank	Bank of Liverpool, Ltd.	Settle and Farmer, Architects, Ulverston	,, 7
Alfreton—Alterations to Church		C. Hodgson Fowler, F.S.A., Architect, Durham	,, 7
Pontycymmer—Cottage at Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 8
Exmouth—Additions to Shop and Premises, Chapel-street	F. S. Wilson	R. M. Challice, Architect, 9, Bedford-circus, Exeter	,, 8
Mill of Glanderston—House	Dawson and Co.	John Craigen, Solicitor, 193, Union-street, Aberdeen	,, 8
Armagh—Improvements to Premises at the Mall		H. C. Parkinson, Architect, College-street, Armagh	,, 8
Kirton—Enlargement at Church End School	School Board	John H. Tooley, Clerk, 6, Bridge-street, Boston	,, 8
Bynea, Wales—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 8
Keighley—Alterations at Workhouse	Guardians	John Judson and Moore, Architects, York Chambers, Keighley	,, 8
Annfield Plain—Alterations at Sewage Disposal Works, Kyo	Urban District Council	T. J. Trowsdale, Surveyor, Annfield Plain, Durham	,, 8
Halifax—Extension of Premises	J. H. Waddington	Jackson and Fox, Architects, 7, Rawson-street, Halifax	,, 8
Penygraig—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 8
Macclesfield—Additions to St. Peter's School	Managers	Jabez Wright, Architect, 27, King Edward-street, Macclesfield	,, 8
Huddersfield—Additions to Paddock Cong. Sunday School		J. Berry, Architect, 9, Queen-street, Huddersfield	,, 8
Wallsend—Park Lodge and Boundary Wall	Urban District Council	George Hollings, Surveyor, Council Office, Wallsend	,, 8
Hendford—Goods Shed and Offices	Great Western Railway Co.	G. K. Mills Secretary, Paddington Station, London	,, 8
Sheffield—Additions to Car-Sheds	Tramways Committee	Charles F. Wike, C.E. City Surveyor, Town Hall, Sheffield	,, 8
Wakefield—Kirkgate Tavern	Coffee and Cocoa Tavern Co., Ltd.	William Watson, Architect, Barstow-square, Wakefield	,, 8
Heckmondwike—Extensions to Wesleyan Sunday School	Trustees	Henry Stead, Architect, Heckmondwike	,, 8
Withington—Station Buildings	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 8
Kirton—Enlargement at Kirton Holme School	School Board	John H. Tooley, Clerk, 6, Bridge-street, Boston	,, 8
Halifax—Extensions to Premises, Powell-street	J. H. Waddington	Jackson and Fox, Architects, 7, Rawson-street, Halifax	,, 8
Tonyrefail—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 8
Edgware—Repairs to Workhouse	Hendon Union Guardians	F. J. Seabrook, Clerk, Union Offices, Edgware	,, 9
Peckham, S.E.—Offices, Lyndhurst-road and Peckham High-st.	Amalgamated Society of Engineers.	C. Thompson, Architect, 203, Graham-road, Hackney	,, 9
Hexthorpe—Infant School (350)	Balby-with-Hexthorpe S.B.	The Architect's Office, 11, Priory-place, Doncaster	,, 9
Pilsley—Wesleyan Sunday Schools		A. E. Eyre, Architect, St. Chad's-road, Derby	,, 9
Coventry—Isolation Wards at Hospital	Committee	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	,, 9
Walton—Nurses' Home at Workhouse, Rice-lane	West Derby Guardians	The Architect, Brougham-terrace, West Derby-road, Liverpool	,, 9
Leeds—Alterations to Offices, Pease's Buildings	Board of Overseers	Bedford and Kitson, Architects, Greek-street Chambers, Leeds	,, 9
Hendon—Repairs to Workhouse Buildings	Guardians	F. J. Seabrook, Clerk, Union Offices, Edgware	,, 9
Cleethorpes—Wesleyan School-Chapel, Lovett-street	Trustees	Gelder and Kitchen, Architects, Hull	,, 9
Tonypandy—Business Premises adjoining Town Hall	Edward Jenkins	Griffiths and Jones, Architects, Tonypandy, Wales	,, 9
Mayford, near Woking—Manual Room, and Alterations to Swimming Bath at Industrial School	London County Council	The Architect's Department, 13, Spring Gardens, S.W.	,, 10
Bridlington Quay—Three Double-fronted Houses, Horsforth-av.	F. Lowson	J. Earnshaw, Architect, Carlton House, Bridlington Quay	,, 10
Lochboisdale—Alterations, Castlebay School	Barra School Board	J. Hill, Banker, Lochboisdale	,, 10
Purston—House and Shop	J. Williams	Garside and Pennington, Architects, Pontefract	,, 10
Ambergate—Grain Shed at Burton Station Buildings	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	,, 10
Leeds—Congregational Church, Harehill-roads		T. Dyer, Architect, 74, Albion-street, Leeds	,, 10
Wrexham—Ward at Infirmary	Committee	Lockwood and Sons, Architects, Chester	,, 10
Abergavenny—Repairs at New Cemetery	Joint Burials Committee	J. T. Rutherford, Clerk, Town Hall, Abergavenny	,, 10
Pontefract—Villa Residence, Coachhouse, &c., Ackworth-road	G. Smith	Garside and Pennington, Architects, Pontefract	,, 10
Bermondsey—Alterations to Town Hall	Vestry	The Surveyor, Town Hall, Bermondsey, S.E.	,, 10
Swansea—Engine and Boiler Houses	Harbour Trustees	A. O. Schenk, Engineer, Harbour Offices, Swansea	,, 10
Bradford—Sunday School, Little Horton-lane	Trustees of Annesley Chapel	Jas. Ledingham, F.R.I.B.A., District Bank Chambers, Bradford	,, 10
Throckley—Twenty-Two Cottages	District Co-operative Society, Ltd.	F. C. Charlton, Throckley	,, 11
Rhyl—Intermediate School	Governors	Frank H. Shayler, Architect, Welshpool	,, 11
Aldershot—Additions to 10, Station-road	J. Lazareck	Friend and Lloyd, Architects, Aldershot	,, 11
Bradford—St. Oswald's Church, Chapel-green		T. H. Healey and F. Healey, Architects, 42, Tyrrel-st., Bradford	,, 12
Elgin—Residence, Mayne-road		Robert B. Pratt, A.R.I.B.A., County Bank House, Elgin	,, 12
Londonderry—Six Alms Cottages, Carrigans-lane	Trustees	R. Eccles Buchanan, Architect, 33, Shipquay-street, Derry	,, 12
Shipley—Two Villas, Stabling, &c.		Rhodes Calvert, F.R.I.B.A., 4, Forster-square, Bradford	,, 12
Coventry—Cloakroom, &c., at Bablake Schools, Coundon-road.	Gen. Municipal Charities Trustees	H. W. Chattaway, Architect, Trinity Churchyard, Coventry	,, 14
Leeds—Stone Fenders to Bandstands	Corporation	The City Engineer's Office, Municipal Buidings, Leeds	,, 14
Ashwater—School and Master's House near Cross Lanes	School Board	Sidney Docket, Clerk, Ashwater, Beaworthy, R S.O.	,, 14
Wrexham—Hall, Workshops, &c.	City Council	Thos. Price, Architect, 77A, Lord-street, Liverpool	,, 14
Kingston-on-Thames—Two Padded Rooms at Workhouse	Guardians	W. H. Hope, Architect, Union Offices, Kingston-on-Thames	,, 14
Dundalk—Post Office		H. Williams, Sec., Office of Public Works, Dublin	,, 15
Batley Carr—Eight Houses, Warwick-road	Dewsbury Poineers' Indus. Soc. Ltd.	Holtom and Fox Architects, Westgate, Dewsbury	,, 15
Eastleigh—Workshops, High-street	*Eastleigh Weekly News*	J. Crook, Architect, Eastleigh	,, 15
Baslow—Public Hall		E. Morewood Longsdon F.S.I., Architect, Bakewell	,, 15
Tranmere—Wing to Holt School of Science and Art	Birkenhead Corporation	C. Brownridge, A.M.I.C.E., Boro' Engr., Town Hall, Birkenhead	,, 15
Edinburgh—Extension of City Hospital, Colinton Mains		The Public Works Office, City Chambers, Edinburgh	,, 15
Workington—Enlarging the Railway Hotel	Cleator Moor Brewing Co.	T. Eden, A.M.I.C.E., Architect, 58, Pow-street, Workington	,, 16
Dinas Powis—Two Semi-Detached Villas	John Morgan	W. H. Dashwood Caple, Architect, 1, St. John's-square, Cardiff	,, 16
Filey, Yorks—Coastguard Buildings	Admiralty	The Coastguard Station, Filey, Yorks	,, 18
Kirkwall, Orkney, N.B.—Coastguard Buildings	Admiralty	The Watch Room, Coastguard Station, Kirkwall, N.B.	,, 18
Ashbourne—Union Offices, &c., Compton-street	Guardians	Naylor and Sale, Architects, Irongate, Derby	,, 19
Southend-on-Sea—Technical Schools and Fire Brigade Station	Corporation	Wm. H. Snow, Town Clerk, Southend-on-Sea	,, 21
Clayton-le-Moors—Thirteen Houses, Adelaide-street	Co-operative Society, Ltd.	J. W. Cooper, Secretary, Clayton-le-Moors, Lancs	,, 23
Rotherham—Converting Premises into Shops, &c.	General Purposes & Parks Com.	J. Platts, Architect, High-street, Rotherham	,, 24

BUILDINGS—*continued.*

Rotherham—Remodelling Mechanics' Hall	General Purposes & Parks Com.	J. Platts, Architect, High-street, Rotherham	Aug. 24
Malvern—Sanatorium	Urban District Council	The Surveyor's Office, Malvern	„ 30
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	„ 31
Malmo—Electricity Works		The Gasworks Directors, Malmo. Sweden	Sept. 1
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	„ 12
Oulton—Infants' School	School Board	F. R. Richards, Architect, Stanley-street, Lowestoft	—
Scholes—Eight Houses		Percy Robinson, Architect, 72, Albion-street, Leeds	—
Penarth—Wesleyan Chapel, Stanwell-road	Trustees	Jones, Richards, and Budgen, Architects, 18, St. Mary-st., Cardiff	—
Kegworth—Wesleyan Schoolroom		F. G. Knowles, Kegworth	—
Leeds—Stables, &c., Cavendish House	Dr. S. Rumboll	F. Mitchell, Architect, 9, Upper Fountaine-street, Leeds	—
Heckmondwike—Reslating Catholic Schools		The Rev. P. Hickey, Heckmondwike	—
Kingswood—Four Houses		T. J. Moss-Flower, A.M.I.C.E , Scottish Bldgs., Baldwin-st., Bristol	—
Middlesbrough—Wesleyan Schools	Trustees	R. Moore, Architect, 27, Albert-road, Middlesbrough	—
Braithwaite—Small Church		George Watson and Son, Architects, 3, St. Andrew's-place, Penrith	—
Low Wortley—House and Shop, Branch-road		W. H. Lister, 1, Branch-street, Farnley	—
St. Andrews—Additions to Farmhouse, Prior-Lethan	Governors of the Madras College	David Henry, Architect, St. Andrews, Scotland	—
Ballinamallard—House and Shop		Robert Creighton, Wine Merchant, Ballinamallard	—
Morecambe—Three Houses, Heysham-road		Walker and Collinson, Architects, Market-street, Morecambe	—
Rotherham—Confectionery Bakehouse, Norfolk-street	Masboro' Equit. Pioneers' Soc., Ltd.	J. E. Knight, Architect, 33, College-street, Rotherham	—
Wolverhampton—Wesleyan Church, Darlington-street		A. Marshall, A.R.I.B.A., Architect, King-street, Nottingham	—
Great Yarmouth—Three Houses, Alderson-road		George Waller, Architect, 3, Middlegate-street, Great Yarmouth	—
Stourbridge—Victoria School of Science and Art	Technical Board	J. M. Gething, Architect, Queen-street, Stourbridge	—
Bishopston—Conversion of Two Dwelling-Houses into Shops		T. J. Moss-Flower, A.M.I.C.E., Scottish Bldgs, Baldwin-st., Bristol	—
Wellington, Salop—Workmen's Cottages (200)		H. A. Matear, The Temple, Liverpool	—
Arnside—Residence	Thomas Crossfield	John Hutton, M.S.A., Architect, Kendal	—
Stockcross—Bandstand, &c., for Flower Show		J. A. Francis, Hon. Sec., Stockcross	—
Marple—Cowhouse		S. Hargraves, Land Agent, Marple	—
Kingsclere—Alterations to Property, George-street	Parish Council	C. E. Westcombe, Clerk, Swan-street, Kingsclere	—
Featherstone—Two Shops, &c.		Garside and Pennington, Architects, Pontefract	—
Brecon—Intermediate School		J. H. Phillips and F. Baldwin, Joint Architects, Cardiff and Brecon	—
North Ormesby—Wesleyan Schools	The Trustees	Robt. Moore, Architect, 27, Albert-road, Middlesbrough	—
Featherstone—Two Villa Residences		Garside and Pennington, Architects, Pontefract	—
London—Proposed Houses on Suburban Estates		Per Advt.: "Suburban Estates," Building News Office	—
Waterford—Repairs to Premises, Bailey's New-street	Holy Ghost Hospital	R. H. Kelly, 21, The Mall, Waterford	—
Friern Barnet—Enlarging St. Peter's Schools, Sidney-road		Alfred Cox, Architect, 37, Baker-street, Portman-square, W.	—
Purston—House and Shop		Garside and Pennington, Architects, Pontefract	—
Carlisle—Additions to Houghton House	H. Brooks Broadhurst, J.P.	Oliver and Dodgshun, Architects, 5, Lowther-street, Carlisle	—
Plaistow—Thirty Cottages, Alnwick-road, Custom House		H. I. Cundy, 91, The Grove, Stratford, E.	—
Ashington—Stores, Seaton Hirst	Newbiggin and District Co-op. Soc.	Boolds and Hardy, Architects, Morpeth	—
Shipham—Repairs to Church		E. Buckle, Architect, 23, Bedford-row, London, W.C.	—
Bury, Lancs—Additions to the Egyptian Mills	E. D. Milnes	C. H. Openshaw, Architect, Fleet-street, Bury	—
Liscard—Welsh Congregational Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Fermanagh—Pump-House, &c., at Portora Royal School	Board of Education	Thomas Elliott, Architect, Enniskillen	—
Barrow, Lancs—Reslating Eleven Houses, Drake-street		E. Basil Lupton, 14, East-parade, Leeds	—
Whitby—Four Villas, West Cliff Estate	Capts. Ebblewhite and R. D. Foster	Henry Walker, West Cliff Estate Office, Whitby	—
Pontefract—Alterations to Premises		Garside and Pennington, Architects, Pontefract	—
Saltley—Theatre	A. Carlton	Thos. Guest, Architect, Corporation-street, Birmingham	—
Billingham—House near Haverton Hill Church		Mrs. Booth, South View, Billingham	—
Middleton—Chapel and Schools	Wesleyan Chapel Trustees	E. Wood, A.R.I.B.A., Architect, 78, Cross-street, Manchester	—
West Kensington—Plastering Work		W. Smith, Builder, 67, Denmark Hill, Camberwell, S.E.	—
Colwyn Bay—Steam Laundry, Llanelian-road	Steam Laundry Co., Ltd.	Taylor and Burgess, A.R.I.B.A., Architects, Longton	—
Lismore—Improvements in Chancel of Cathedral		The Deanery, Lismore	—
Sheffield—Alterations to Shops at Moorhead	T. Hill	J. P. Earle, Architect, Norfolk-row, Sheffield	—
Colbren—Repairing Cottages		J. F. Bell, Manager, Drym Colliery, Onllwn, Neath, and Brecon Ry.	—
King's Lynn—Gallery in Music Hall	Forward Association	William Jarvis, Architect, Market Square, King's Lynn	—
Swanscombe—Concrete and Brick Work		J. B. White and Bros., Limited, Swanscombe, Kent	—
Dewsbury—Rebuilding Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	Fred. W. Ridgway, F.R.I.B.A., Archt., Boro' Chambers, Dewsbury	—
Cradley—Baptist Church		H. T. Butler, Architect, Cradley Heath	—
New Bilton—Additions to Schools	Managers	J. Ace Beynon, M.S.A., Architect, Frome, Somerset	—
Uxbridge—Business Premises, Vine-street	Randall Bros.	William L. Eves, Architect, 54, High-street, Uxbridge	—
Sutton-in-Ashfield—Staging, &c., in Town Hall		The Co-operative Society, Mount-street, Sutton-in-Ashfield	—
Dewsbury—Restoration of Dewsbury Moor Schools	School Board	Fred. W. Ridgway, F.R.I.B.A., Archt., Boro' Chambers, Dewsbury	—
Hucknall Torkard—Two Villas and Four Cottages	Samuel Coupe	Frederick Gratian, Architect, Hucknall	—
Tonna—Incline at Wenallt Colliery		38, St. Anne's Terrace, Tonna, Neath	—
Swansea—Premises on the Strand	Cambria Cold Storage and Ice, Ltd.	T. Hurlington Jones, Secretary, Bank Chambers, Swansea	—
Darwen—Grand Stand at Anchor Ground	Football Club	John B. Thornley, Architect, 45, Market-street, Darwen	—
Cumberland—Cutting Foundations at Clifton Colliery		J. Gilchrist, Clifton Lodge, near Workington	—
Senghenith—Business Premises, Commercial-square	J. Jones and J. Morgan	E. H. Bruton, F.R.I.B.A., Architect, 15, Queen-street, Cardiff	—
Thornton Heath—Chapel, Parchmore-road	Wesleyan Chapel Trustees	Frederick W. Ledger, Architect, 8, Philpot-lane, E.C.	

ENGINEERING.

Southampton—Dredging Work off the Town Quay	Harbour Board	A. H. Skelton, Clerk, Southampton	Aug. 5
Belfast—Entrance to Spencer Dock	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast	„ 5
Haverfordwest—Bridge Repairs	Pembrokeshire County Council	Arthur H. Thomas, Assistant County Surveyor, Haverfordwest	„ 5
Bailieborough—Sinking Well in Market-square	Rural District Council	Hugh Clarke, Clerk, Workhouse, Bailieborough	„ 5
Cork—Sinking Wells, &c., at Rathpeacon and Ballinvarrig	Union District Council	John Cotter, Clerk, Board-room, Workhouse, Cork	„ 5
Newbold-on-Avon—Cast-Iron Water Mains (1¼ mile of 3in.)	Rugby Rural District Council	T. W. Willard, Surveyor, Rugby	„ 5
Blackburn—Earthworks and Masonry	Highways Committee	R. E. Fox, Town Clerk, Town Hall, Blackburn	„ 7
Bakewell—Gas-Main	Urban District Council	Vernon R. Cockerton, Clerk, Bakewell	„ 7
Blackburn—Rebuilding King's Bridge	Highway Committee	R. E. Fox, Town Clerk, Town Hall, Blackburn	„ 7
Withington, Lancs—Wiring, &c., Town Hall	Urban District Council	A. H. Mountain, A.M.I.C.E., Surveyor, Town Hall, Withington	„ 8
Salford—Steam Dynamos (eight 750k.w.)	Corporation	Lacey, Clirehugh, and Sillar, Engrs, Qu. Anne's-gate, Westmnster	„ 8
Bristol—New Railway Lines at Harbour (1 mile)	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 8
Southampton—Slipway for Floating Bridges on River Itchen	Floating Bridge and Roads Co.	C. W. Murray, M.I.Mar.E., M.I.N.A., Oriental-pl., Southampton	„ 8
Rathdown—Cleaning Bed of River at Dundrum	Rural District Council	Patrick Cunniam, Clerk, Loughlinstown	„ 9
Madrid—Insulators (50,000)		The Post and Telegraph Department, Madrid	„ 9
St. Alban's—Laundry Machinery	Guardians	H. E. Hansell, Architect, Granville-road, St. Alban's	„ 9
Kingswood Hill—Pumping Plant	West Gloucestershire Water Co.	E. D. Marten, C.E., The Birches, Codsall, Wolverhampton	„ 9
Broughton, Stokesley—Stone Bridge	Rural District Council	W. H. Dixon, Surveyor, Kirby-in-Cleveland	„ 10
Glasgow—Two Bridges over the River Clyde	Corporation	John M. Lindsay, Interim Clerk, City Chambers, Glasgow	„ 10
Nelson—Electric Lighting Cable	Gas Committee	W. Foster, Gasworks, Nelson	„ 10
Hartley Wintney—Septic Tanks, Filters, and Land Filtration	Rural District Council	Fairbank and Son, C.E., 13, Lendal, York	„ 11
Tarvin—Waterworks	Rural District Council	H. Birch Killon, A.M.I.C.E., 22, Cooper-street, Manchester	„ 11
Preston—Bridge over the River Darwen	Lancashire County Council	W. Harold Radford, Bridgemaster, County Offices, Preston	„ 11
Hensbridge—Reservoir	Wincanton Rural District Council	Cyrus Coombes, C.E., Tisbury	„ 11
Biddulph—Water Supply	Urban District Council	C. Russell Hall, C.E., 1, West-street, Congleton	„ 12
Goole—Heating, &c., Public Baths	Urban District Council	F. Chambers, Surveyor, Poole	„ 12
Milford—Sinking Wells in Kilmacrenan and Carrigart	Rural Council	S. Watters, Clerk, Board-room, Milford	„ 12
London, S.W.—Three-Lift Telescope Gas-Holder (145ft. diam.)	Wandsworth & Putney Gaslight Co.	H. H. Jones, Eng. & Mangr., Gasworks, North-st., Wandsworth, S.W.	„ 14
Southwold—Pier	Coast Development Co., Ltd.	W. Jaffrey, Engineer, 3, Victoria-street, London, S.W.	„ 15
Barking—Laying Cast-Iron Pipes (1,886 yards)	Urban District Council	C. J. Dawson, Surveyor, F.R.I.B.A., Public Offices, Barking	„ 15
Great Crosby—Tramway (1,908 lineal yards)	Urban District Council	Watkin Hall, A.M.I.C.E., Council Offices, College-road, Gt. Crosby	„ 16
Carlisle—Boilers at Electricity Station, James-street	Corporation	Prof. Alexr. B. W. Kennedy, 17, Victoria-st., Westminster, S.W.	„ 17
Carlisle—Engines, Dynamos, and Condensing Plant	Corporation	Prof. Alexr. B. W. Kennedy, 17, Victoria-st., Westminster, S.W.	„ 17
Motherwell—Boilers, Engines, Dynamos, Arc Lamps, &c.	Commissioners	Prof. Alexr. B. W. Kennedy, 17, Victoria-street, Westminster	„ 18
Adlington—Sludge Works	Urban District Council	Theo. S. McCallum, A.M.I.C.E., 52, Corporation-street, Manchester	„ 19
Blackpool—Electrical Equipment of Tramcars	Corporation	Robert C. Quin, M.I.E.E., Electricity Works, Blackpool	„ 21
Colwyn Bay—Boiler, Pumps, Tank, &c.	Urban District Council	William Jones, A.M.I.C.E., Council Offices, Colwyn Bay	„ 22
Sophia—Passenger Cars and Goods Waggons	Bulgarian State Railways	The Commercial Dept. of the Foreign Office, Downing-st, S.W.	„ 22
Colwyn Bay—Steam Dynamo (60kw.)	Urban District Council	William Jones, A.M.I.C.E., Council Offices, Colwyn Bay	„ 22
Colwyn Bay—Switchboard, Accumulators, and Street Cables	Urban District Council	William Jones, A.M.I.C.E., Council Offices, Colwyn Bay	„ 22
Cligerran—Bridge at Cwmplysgog	St. Dogmells Rural District Council	John Evans, District Surveyor, Tyhen, Rhoshill, R.S.O.	„ 23
Plymouth—Deep-Sea Outfall Sewer	Corporation	James Mansergh, C.E., 5, Victoria-street, Westminster	„ 24
Ashford, Kent—Rising Main, &c.	Rural District Council	Bailey-Denton, Son, & Lawford, MM.I.C.E., 9, Bridge-st., Westmstr	„ 28
Westbury-upon-Trym—Sewage Disposal Works	Barton Regis R.D.C.	A. P. I. Cotterell, A.M.I.C.E., 7, Baldwin-street, Bristol	„ 28
Perth—Electric Lighting Plant	Lord Provost and Commissioners	W. C. C. Hawtayne, M.I.E.E., 9, Queen-street-place, London, E.C.	„ 28
Sophia—Locomotives	Bulgarian State Railways	The Commercial Dept. of the Foreign Office, Downing-st., S.W.	„ 30
Westbury—Service Reservoir, Pumping Station, Well, &c.	Westbury & Whorwellsdown R.D.C.	W. H. Stanley, A.M.I.C.E., Market House Chambers, Trowbridge	„ 30
Battersea, S.W.—Batteries, &c.	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Edinburgh—Electric Lighting Gear, &c.	Magistrates and Council	Prof. A. B. W. Kennedy, 17, Victoria-street, Westminster	„ 31
Battersea, S.W.—Overhead Travelling Crane, &c.	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Battersea, S.W.—Electric-Lighting Works	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Grange—Water-Works	Grange Co-operative Dairy Society	J. O'Malley, B.E., Grange, Kilmallock	—
Arklow—Swivel Bridge, North Quay	Harbour Commissioners	The Harbour Master, Arklow	—
Bradford—Excavating (2,000 cube yards)		John Jackson, Architect, Barry-street, Bradford	—

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STRUCTURAL AND APPLIED DECORATION.

THE decoration of buildings may be considered under two aspects — first, structural, in which the architectural features of the exterior or interior are made to play their part, and secondly, superficial or the application of ornament totally independent of structure. Both systems have their advocates. If the architecture of a room or interior, to which we now mainly refer, is its proper decoration, our ordinary modern building would share very badly, for there is so little attempted in the way of architectural or decorative planning. Take as instances our new town halls, free public libraries, and schools—how few of them exhibit anything but the barest walls and ceilings! There is no attempt at introducing what we may call modelling of parts, bays or recessed portions; the plastering is of the barest, there is no art modelling, seldom anything beyond a meagre attempt at breaking up the room by pilasters or panelling. Our old interiors, the Mediæval halls, the old Tudor residences, the houses of the Stuarts, and of the Hanoverian age, all show that the exterior architecture did not stop on the outside, but pervaded the interior as well. The architectural design was organic: it gave form and substance to each part of the building. But all is now changed; the connection between the outside and inside of our buildings has been broken by some extraordinary influence, till now we find the architect's work practically confined to the exterior; while the interior is handed over to the decorator and upholsterer. This separation has accompanied other branches as well, and is the result of the modern division of labour. In short, internal decoration is no longer any part of the architect's work. The consequences to our architecture is too apparent. He leaves the interior to the fitter-up, the decorator, and the painter, who require a free hand. The modern perfunctory professional is rather pleased at this arrangement, as it reduces his labour in the design of details. Just to leave the bare walls plastered and the ceiling picked out in one or two shades of colour is to complete his work. To run a few mouldings on ceiling and walls, often without any reference to anything else in the room, is his idea of decoration;—it is the least he can do to give a finish internally. The modern idea of decoration is superficial: it consists of applying mouldings or ornament —often misplaced—stencilled decoration or colour to the interior. This superficial treatment has, of course, encouraged the decorative artist, the paper-hanger, the relief plaster manufacturer, and the keramic artist or tile-maker, and has widened the breach between the structural and superficial aspect of decoration. With the loss of structural ornament, the architect has been content to rely more and more on applied decoration on such things as gesso, stamped and embossed fabrics, stencilled ornament, and wall hangings; on paper and leather, chintz, tapestries, &c.; and a school of decorative artists have arisen who have tried to bring this treatment within proper artistic conditions.

The history of wall treatment points to several distinct stages. The Mediæval castle, with the warlike state always before their occupants, favoured the employment of portable hangings like arras, hence the fine tapestries of Northern Europe, and these were subordinated more or less to the architectural lines by being made to fill panels. Afterwards when the castle became less of the fortress and more of the residence, the ornament assumed a more architectural character, and plaster or wooden panelling became common. The best period of tapestry decoration was when it was woven to fill in the wall spaces and panels arranged architecturally. Good tapestry hanging never turned the corner like a piece of wall-paper; no other kinds of decoration were combined with it, so that it had not the scrappy appearance of the modern room, with bits of this and that, wall pictures, plaques, and other things. The tapestry form of wall decoration is still used in good houses; but there are few successful applications.

The Italians were *par excellence* architectural decorators, and the walls of their palaces were enriched by marbles and stucco, or mosaic and fresco. We may point to the stucco wall decoration of the Royal Palace, Mantua, and the Palace Genoa as examples of Late work. In our own country wood panelling took the place of marble and stucco; it was a warmer and more comfortable material than stone or plaster. It is remarkable that all these modes of internal decoration have been revived within our time. Each has had its advocates; each mode has been set up as the origin of decoration. No doubt plaster can claim priority as regards age; but wood, especially oak panelling, has many advantages in this climate. We have lately revived oak wall linings, and we see all kinds of imitations—oak veneers, parquet-work, stamped or pressed materials that imitate flat oak relief. Some of these substitutes answer well, the parquet especially; but how little they are used in the true structural sense of the old work. In the hands of the mere decorator these linings follow no structural lines, either horizontal or vertical, but are applied much as we see embossed leather or fibrous plaster applied without reference to the pattern.

What are the principles that should determine the decoration of our apartments? Upon the answer to this question will depend our choice of a mode of decoration. In a large public building, or in State apartments, the right idea seems to be to make the walls and ceiling the chief decoration in themselves; we expect them to assume a structurally decorative character of their own, to have certain subdivisions of wall space by pilasters or detached columns, and architrave members and ribs in the ceiling. In such rooms pictures or other ornaments are subordinate to the main design, and it would be a mistake to see it overlaid with a number of small objects, however interesting. On the other hand, in our small rooms appropriated for family use or living, the idea is to make the walls form a background for pictures, china, or furniture. As a background the structural lines may be less pronounced, or the walls simply divided into panels to suit the pictures. The pictures should, in fact, be treated as part of the decoration, and be sunk in panels with stucco mouldings, or the frames made to accord with the style of the room. Our old mansions of the 17th and 18th centuries show their walls treated in this manner as backgrounds for paintings, as in Hawkesmoor's saloon at Easton Neston, in many of our old Georgian houses of the early part of this century. The Chapter-house, St. Paul's-churchyard, is a good example. The simple background idea of wall treatment is to make it as neutral as possible, not to emphasise architectural features, and to make the wall spaces uniform in colour. Dadoes and friezes and overdoors may form part of the scheme, but they should be quiet and unobtrusive, and the elaborate patterned dado or frieze is out of place.

A class of treatment in which the walls form in themselves a decorative character, though not in any structural sense, comprises a variety of methods. We may include decorative wall-papers, chintz tapestry, fresco decoration, &c. In this kind the wall itself is the decoration, and pictures or other overlaid objects would be out of place. Stucco panelling and fresco painting come under this head. They are wall treatments in themselves, and are not intended to be covered by pictures or bric-a-brac. The best and highest form of this decoration is fresco painting, and if our painters bestowed their attention on wall-painting, such as we find in the Pompeian house or in many Italian villas, we might have a school of artists worthy of the art.

The wall-paper is a form of independent decoration that has been revived. We do not condemn it because of its failure, and of the atrocities of the past. As a decoration in itself, it is clearly a mistake to hang pictures or prints upon it. "Pictures should never be hung against a background of pattern," has been well said by an authority in decoration. Imagine pictures hung on a large scrolling pattern of pronounced distinctness and colour; and yet we see such things done every day in many a town and suburban residence. The wall-paper pattern effaces all structural and architectural lines, the dado and frieze lines cut the pattern awkwardly, hence we prefer to avoid all obtrusive patterns and colours in rooms where architectural lines appear. Still the well-designed wall-paper has its value as a cheap form of decoration for ordinary rooms, always remembering that the wall-paper is an independent decoration, and the less it is overlaid the better. The question, we repeat, is whether the wall is to become a background or a decoration. If the former, the object should be to use monotones and subdued tones, and to depend on simple wall surfaces and panelling; if the latter, to avoid the obtrusion of other kinds of decoration, like pictures and *bric-à-brac*. The two conditions cannot co-exist.

Turning our attention to structural forms of decoration and to relief, a few words may be said. Our stucco ornamentation is often coarse, and designed without reference to the uses of the room or to any law of gradation. Those who have visited the Palace at Versailles, and inspected any of the beautiful apartments there, such as the Library of Louis XVI., with its refined panelled bookcases and frieze, will have noticed what we mean. The cases here form a continuous wall lining, the shelves are built into the wall and form an organic part of the wall decoration. The detached bookcase is scarcely known. Look again at the refined stucco Louis XV. decoration in the Petit Trianon, Versailles, the delicate panel treatment in the Salon and other apartments of the Palace of Fontainebleau, and we shall see at once the gradation of the panelling and ornament. The most delicate stucco ornament is to be found in the boudoir decoration of these palaces. There was an admirable sense of gradation often extremely simple in these small rooms, sometimes rich and delicate as in the Château of Chantilly, and the painter of boudoir or gala scenes accentuated their beauty by painted medallions and marquetry.

Michael Angelo's dictum that "Art is a Transfiguration of Nature by Love" was observed by all great decorative periods, but is now ignored. It is cheap realism that is popular now. People surround themselves with pictures in which "finish," or what is so considered, is the chief end—a mere imitation of nature. A true painter, when he has a space to decorate, takes a thought about nature or life which he expresses with a subtle instinct. He gives it shape, tone, and colour; he has the power of abstraction, of including natural facts, but giving them a general expression. Painters like Da Vinci, Corot, and Burne-Jones knew how to use details: they are no mere reflections of the particular.

Sculpture as a decorative element is often grossly employed. We see sprawling cupids and female figures draped with impossible drapery in the spandrels of our cheaply-built and over-elaborated theatres; there is no rule of proportion or gradation followed. How different to the sculpture of the Greek! The frieze of the Parthenon realises, it is said, "the infinite suggestions of Nature: not by scientific imitation, but by a frank conventionalism, which not only flattens objects that are raised, but even alters contours." The want of proportion or adaptability of sculpture, or relief, to position is a common modern defect. To take the Pan-Athenaic Procession; one authority refers to the copy of it on the gateway at Hyde Park Corner. He maintains justly that it is quite out of place on the gateway, and the principles of the sculptor of the original frieze have been entirely overlooked. "In the Athenian building, the high sidelight was obscured by a row of external columns, and the relief could only be seen by looking up at it at a few feet distant; it was therefore absolutely necessary that no part should project much beyond the rest. Now, in London the frieze is meant to be seen some distance off, and could receive whatever light our climate affords. Seen where it is, the relief is obscure, if not almost indistinguishable, resembling a bit of tracery, or anything, in fact, but a procession of men and women." This is what we do by slavishly copying Greek sculpture in our modern buildings. The difference due to our dull skies has also to be considered. In the Haymarket a palatial hotel has been covered with fine carving which can scarcely be distinguished below, and which in a few months will be obscured by smoke.

We see on scores of buildings in the West-End, sculptural decoration, or stucco ornaments in gables and tympana, that are too fine and elaborate. The relation of sculpture and ornament to position is ignored by the mode adopted to teach our sculptors and carvers. They are given plaster casts or ornament in the flat to copy, and these models are used for every position. The degree of relief is a matter of indifference. In London, boldness of design and relief are required for friezes and tympana on the upper part of our buildings, though this quality too often degenerates into coarseness. There is one City building in which a truer conception of sculptural relief has been carried out, the Institute of Chartered Accountants. The frieze is thoroughly Greek in refinement, and of high relief, with modern figure types and costumes, and the sculptors, Mr. Thorneycroft, R.A., and Mr. H. Bates, A.R.A., have shown how this change can be made without sacrificing beauty. The secret of high decorative architecture is to add interest and life to dignity; uniformity and regularity in the main features, and change of detail and variation in the smaller parts. We have another lesson to learn in the language of Ruskin, "Not to esteem smooth minuteness above shattered majesty."

TOURING AND SKETCHING.

In the course of a few weeks most of our West-End and City offices will be practically closed for the season, and the knights of architecture and the drawing-board and tee-square will be enjoying themselves in favoured localities "by crag or fell" or sea at home and abroad. The busy practitioner will betake himself to complete rest; he will try, if that is possible, to cast off from his mind all thoughts of business. There is another and perhaps larger class who seek to combine business with pleasure, and who invariably bring home with them impressions and a stock of useful ideas that may be turned to account. And there is the architectural and artistic class of tourists who go to receive impressions, to fill their sketchbooks with reminiscences of localities or buildings. There are some ways of turning to account these holiday tours and rambles. The architectural "scorcher," like the cyclist who goes to make a record journey, is not satisfied with a moderate amount of sketching: he tears over every place where there is an old church or castle or hall; he draws and measures against time, and his ambition is to "knock off" as many sketches as he can and fill his portfolio with such "game." But a good deal of this labour is thrown away: the drawings or sketches are too hurried to be reliable or accurate, and if he desires to redraw them he finds many awkward discrepancies in his handiwork. The more leisurely work of the man who deliberately selects his subject, and deals with it either comprehensively or in detail, is of more value. Rushing about promiscuously from one to another building is exciting and interesting as a question of visiting.

A succession of mapped-out visits or tours like those which the Architectural Association make every year is of value as an educative influence; it opens the eyes and minds of the younger men to a variety of style, of arrangement, and design; they see buildings which make a lasting impression on them, and which probably few of them will ever have the opportunity of seeing again. In these visits the students go prepared to do some sketching, and many useful drawings are brought home. There is also some leader of the party to conduct and explain. But the ordinary tourist is without these advantages: he goes often unprepared; he commences to make a sketch or two of certain views. These are interesting as records and reminiscences, but have no other merit. The rough-and-ready sketcher has little time to make notes with regard to any peculiarities of plan or design; he takes no notice of jointing, of any methods of execution that may be discovered. But the more observant and critical visitor, whose main intention is to examine closely, and whose aim is not to make a scamper through the district, is likely to bring back more useful observations. His sketches may be more fragmentary, but he generally takes care to make a rough key-plan of the building, and to note on it any peculiar arrangement or feature. He may not colour his sketches, but he takes care to note the kind of material or nature of the stone or timber, any peculiarity of execution, and to fill his book with remarks.

A great deal may be said on the influence of travel on architecture. As an educational agency it is supreme, as no study of books or illustrations will supply the student with all he needs to know. Its influence on the buildings of our age has been immense. In no former period of the history of the art has the architect had the same facilities of travel, and we owe to it the varied cosmopolitan tastes of the day. Travel was one of the great influences, next to the literature and romance of the age, which helped to bring about the Gothic and Classic revivals of this century. No doubt it has had its disadvantages also, by encouraging a tendency towards a scrappy style of design—a fondness for "tit-bits," and a corresponding loss of invention and coherency—faults which have marked our architecture. From meagreness and paucity we have gone to the other extreme of an *embarras de richesse*. We think this evil is diminishing with a more intelligent mode of sketching. Our grandfathers, who had a reputation for being accomplished draughtsmen, were more ambitious; they undertook to delineate cathedrals and churches and castles and to make finished drawings of them. Men like Blore, Wild, Britton, Pugin, Owen, and B. Carter published folios of finished plates of most of our Mediæval buildings, which rendered signal service to the study of architecture. Photography and photographic processes have now taken their place, and we have records of our great buildings at once most accurate and microscopic in detail that can bear enlargement and can be magnified. By this aid we are now enabled to devote our attention to the details of buildings which fifty years ago were almost ignored as of subordinate importance. Our delineation of buildings has thus passed into a scientific stage, less artistic perhaps, but more exact and methodical. Beautiful as were the engravings of O. Jewitt, Mackenzie, J. Le Keux, Heaviside, and others which we find in such books as Parker's "Glossary," Rickman's "Attempt," &c., they could not compete with the accuracy of a reproduced photograph, which enables the student to test the correctness of his own drawing by its aid. Then the work at this time was more discursive.

In the early part of this century the architectural student made a journey to the Continent, to France, Italy, or Belgium, with the object of inspecting the great Classic or Mediæval buildings. These impressed him so much that he had little inclination to study the beauties of the cathedrals and churches of his own land. The "grand tour" was a fashionable one for every artist to take in those days. It is not so now. Books and illustrations have made these masterpieces of art common property, and the student's attention is now more directed to the edifices of his own country. Instead of general impressions more or less fugitive, the architectural student can now take up one particular branch of the art and pursue it thoroughly; when he visits an old building, he is induced to study its details, the materials used, the local customs and influences and traditions, and thus make himself familiar with the methods of the builders. By this more analytical inquiry he acquires a more exact knowledge of the building. These are advantages of our modern modes of observation that were not possible when our fathers took hasty rambles abroad. The more careful study of the buildings of our own country have led also to a more perfect knowledge of the architecture of Italy and France, as contemporary works throw side lights on many systems of plan and vaulting. If the Gothic vaulting system arose in France, we can at least follow its progress on this side of the Channel with equal if not greater completeness.

ESTIMATES.—XVI.

THE JOINER—SASHES AND FRAMES.

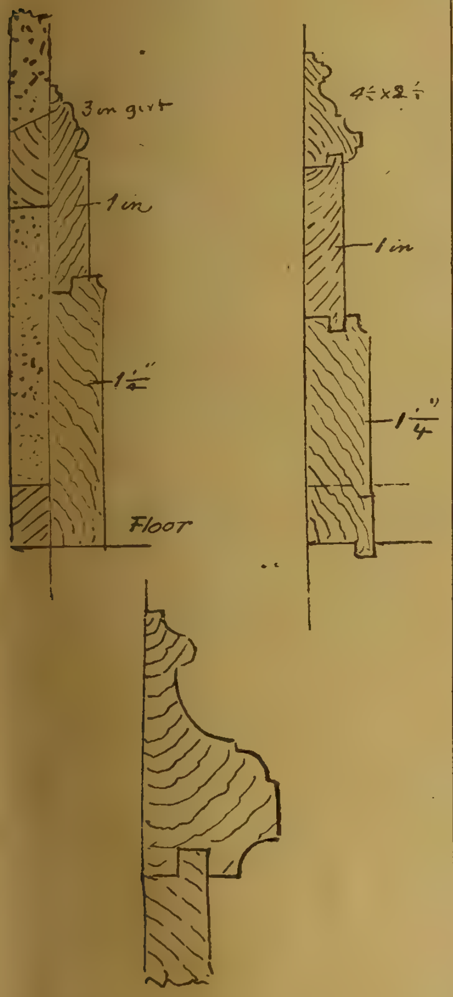
In the valuation of such items as casements and sashes and frames, an analysis of the several parts is necessary in some cases, though for ordinary work experience in valuing such items will enable the estimator to affix a price for the window as a whole. The price per foot superficial for a particular description of sash window is easily ascertainable, and, given the same size and the number of squares, we may fix on a price. If in small squares with moulded bars, the price, of course, is increased. The price also necessarily increases as the window is reduced in size, as the main fixed quantities of cost are the materials and labour in the sash-frames, as all deal-cased frames are made in the same way, and are composed of certain thicknesses of deal grooved and rebated together. As a general rule, we may say the price per foot for ordinary 1½in. sashes and frames is about 1s. 3d. to 1s. 6d., and for 2in. from 1s. 4d. to 1s. 7d., though these prices may be reduced for competitive pricing.

We now resume the items of flooring and skirtings.

120 yards super. 1¼in. wood-block flooring laid herringbone-wise on a cement-floated surface.

Several excellent patented wood-block floors are in the market, as Lowe's Improved System. These range in price from 5s. to 8s, for ordinary woods.

The "Immovable Acme" (W. Duffy's patent) wood-block flooring, manufactured by the Acme Wood-Block Flooring Co., Ltd., Gainsborough-road, Victoria Park, can be laid in London in first quality in yellow deal at 7s. per yard super. A second and third quality are made at 6s. and 5s. respectively. The "Fawcett" patent wood-block floor can be laid in herringbone fashion, the chief feature of which is the additional strength imparted to the pieces by steel tongues, which run through the corners of each block. For price, apply to firm, 50, Queen Anne's Gate.



720ft. run. Deal torus skirting 9in. by 1in. on ground.

These skirtings are imported and the cost varies.

	£	s.	d.
Put price for yellow skirting board	0	0	2¼
Waste	0	0	0¼
Labour, fixing, constant, ·013 day of carpenter	0	0	1¼
	0	0	4

We may analyse the cost of 100ft. run of skirting 1¼in. thick.

As to cost of material, let us take 100ft. run of 9in. boards at 1¼in. thick, equal to 75ft. run.

	£	s.	d.
75ft. super at 2½d., equivalent to £13 Petersburg standard	0	15	7½
100ft run moulding (constant ·012 day of carpenter), 1d. per foot	0	8	4
Add for waste 10 per cent.	0	2	5
Carriage	0	0	6
Fixing (constant ·013)	0	10	5
	1	17	3½

Equal to about 4½d. per foot run.

In some price-books torus skirtings are taken at this price without the mitres.

For fitted ends or the ends housed into architraves, chimneypieces, &c., are often taken as equal to 1ft. of the skirting.

No. 48. Mitres and fitted ends.

Say 4d. each.

210ft. run. 10in. by 1¼in. moulded skirting.

The price of this varies, and it is better to obtain the cost from a moulding importer or merchant of a 100ft. run. It may be put down at from 4½d. to 6d. per foot run, with grounds and backings, say 1d. more.

No. 36. Fitted ends to ditto.

Price at 1ft. run, say 6d. each.

230ft. run. Inch torus skirting, 9in. high.

Price as above.

Skirtings are imported from Sweden and sold by the hundred feet run, say, at 23s. per hundred.

	£	s.	d.
1ft. at above price	0	0	2¾
Waste at 10 per cent.	0	0	0¼
Fixing labour, constant, ·013 at current wages	0	0	1¼
	0	0	4¼
Discount, say 15 per cent., say	0	0	0¼
Per foot run	0	0	4

86ft. run. Moulded skirting in two pieces rebated together, the upper 4½in. by 1in. moulded, 3in. girth, and the lower piece 7in. by 1¼in., rebated and hollowed on edge, wrought one side. (See sketch.)

This is a superior description of skirting, and may be analysed by taking the price of 1ft. run of 1in. by 4½in., and of 1ft. run of 7in. by 1¼in., adding the labour of moulding, planing, and fixing.

	£	s.	d.
1ft. run of 4½in. by 1in. deal	0	0	1
1ft. run of 7in. by 1¼in. deal, say	0	0	1¾
1ft. labour, moulding, 3in. girth, at ·072, say	0	0	2
1ft. in moulding	0	0	1
Planing 1ft. 4in. super., say	0	0	1¼
1ft. rebating edges of both pieces, say	0	0	0⅛
1ft. run, fixing at ·015, say	0	0	1½
Fitting and fixing to floor	0	0	1
Per foot run	0	0	10

No. 8. Mitres to ditto, tongued at angles.

These may be priced at about equal to a foot run of skirting—say 10d. each.

No. 6. Fitted ends ditto.

These may be taken at 8d. each.

20ft. run. Circular skirting, 10in. by 1¼in.

This we have priced at 7d. straight; for circular double the price—say 1s. 2d. per foot.

10ft. run. Ramped skirting, 10in. by 1¼in.

Take this at the same price.

36ft. super. 1in. skirtings, raked and scribed to steps.

To price this correctly, examine drawing of staircase. Roughly, the price may be put at 1s., including grounds and backings.

SASHES AND FRAMES.

In valuing sashes and frames the estimator should carefully take out the quantities of one window with the aid of drawings and specification. The process is tedious, as every part, and the various thicknesses of sashes, outside and inside linings, pulley stiles, &c., have to be superficialed; oak sill, parting strips, grooves run, sash weights and lines, &c., have to be taken, and each item priced out for the whole window. Then the price per foot super. is obtained by dividing total by superficial feet of window. We refer the reader to Leaning's or other textbook of quantities. A table of the value of thicknesses of deal per super. foot, and the labour constants will be necessary.

The quantities for 2in. ovolo sashes 3ft. by 6ft. 6in., will be as follows:—

			£	s.	d.
3 0 0 4½	1 1½	2in. bottom rail			
16 0 0 2¼	3 0	2in. deal stiles and top-rail			
	4 1½				
4 2		Super. of 2in. deal, at say 4d.	0	1	4¾
16 3		Super. labour, constant ·037	0	5	0
16 3		Super. labour, hanging, ·016	0	1	6
		Glue, cleaning up, &c.	0	0	4
		Divide by super. of sashes, 19ft. 6in.	0	8	2¾

Equal to 5½d. per foot super.

The larger the sash the less will be the price per foot.

The quantities for a deal-cased frame must next be taken to arrive at the total result. The ordinary thicknesses for a frame are 1in. inside and outside linings, 1¼in. pulley stiles, double sunk, weathered and throated oak sunk sill, sashes hung with best flax lines, and brass axle pulleys and iron weights, the linings grooved for finishings. For windows of ordinary size, say 4ft. by 7ft., it is easy to find out the quantity of 1in. deal in linings, 1¼in. pulley stiles, the run of oak sill, of parting beads, run of grooves, linings, the cost of sash-lines, axle pulleys, &c., and these quantities would be used for all similar sashes and frames.

In pricing these various items the labour constants may be used. The "labour from bench" and the "labour fixing" are separate, so that for each item the constants for labour and fixing have to be added together with the material.

Frames for single-hung sashes, 1¼in. are sometimes priced at 7d. to 8d.; for double-hung 9d. to 10d. per foot. If circular on plan, an addition of 6d. a foot is made for a curvature of, say, ½in. to the foot.

140ft. super. 2in. deal moulded sashes, double hung in deal-cased frames, 1¼in. pulley stiles, 1in. inside and outside linings, oak double-sunk weathered and throated sill; brass axle pulleys, patent lines, and iron weights, grooved all round for linings.

	£	s.	d.
Put materials down per foot, from items of quantities	0	0	4¼
Labour (constant ·64 hour)	0	0	6½
Oak sill, extra	0	0	1½
Lines and weights for one window:—Say, 8yds. of sash line at 1d., 4 sash weights (40lb.) ½d. per lb. = 1s. 8d., 4 brass pulleys at 10d. each = 3s. 4d., total 5s. 8d., divided by super. of window, is 2½d.	0	0	2½
Hanging sashes	0	0	0¾
Per foot	0	1	3½

Laxton prices double-hung sashes and frames at 1s. 7d. per foot.

84ft. super. 2in. ovolo sashes double-hung to deal-cased frames as before.

	£	s.	d.
Deal	0	0	4½
Lines, weights, pulleys, as before	0	0	3⅛
Labour, fixing per foot super.	0	0	0¾
Labour, on sashes from bench	0	0	4¾
			1½

With profit, say 1s. 3d.

84ft. super. 2in. deal moulded sashes and frames ditto, in small frames.

As these are smaller, they will cost more per foot—say 1s. 6d. per foot.

72ft. super. Deal ovolo moulded 2in. casement 3ft. by 6ft., hung with butts.

This may be priced at 7d. per foot. Laxton puts 10d. for this.

32ft. super. Deal-cased frames as before, with ovolo twelve-light sashes circular on plan, ½in. curve to foot.

This may be priced at about 10d. to 1s. more than the ordinary straight—say 2s. 6d. per foot.

18ft. super. Deal-cased frame and sashes as before, with circular head to frame and sash.

Add to previous item 1s. As a rule, sashes and frames circular on plan, if flat sweep, is worth about 1½ times the price of straight; if of quick sweep, double the price of straight.

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—X.

THERE are three principal dimensions in the design of a cantilever bridge which must be determined, at least with some approximate degree of precision, before even the skeleton elevation can be delineated. These are the length of the cantilever spans, that of the anchor spans, and that of the central or suspended span. The total length of the bridge from one abutment to the other, or the distance in the clear between the terminal supports, is not a matter depending upon either the judgment or the decision of the designer. That dimension is fixed unalterably by the physical features of the site and other collateral local requirements. It is quite true that in the selection of the site, as in the case of the bridge crossing a river, which is the normal condition of nearly every cantilever bridge yet erected, and probably will be for every one to be erected in the future, the engineer laying out the route has sometimes a fairly free hand, but, generally, very little choice is left to him. Take, for example, the very common instance of two towns of importance upon the opposite sides of a river, which for a very long time have had communication with each other only through the medium of a wretched kind of a ferry. When it is decided upon to unite these two towns by a bridge, the site for it is already practically located. Buda and Pesth, forming one town at present on the opposite sides of the Danube, constitutes an apt illustration of our statement.

While, therefore, it is evident that with some rare exceptions the total length of the bridge is unalterable, the same conditions do not obtain with respect to the other dimensions referred to, which are the anchor, the cantilever, and the suspended girder spans. A considerable latitude is allowed to the designer in assigning the proper proportions to these several parts of the whole structure. But there are, nevertheless, certain well-defined maximum and minimum limits which must not be passed. The double object to be accomplished is, that while insuring economy on the one hand, due regard must also be had to the principles and practice of sound and efficient construction. It should be here mentioned that with respect to the span of the suspended girder, the length that theoretical data might assign to it, is sometimes liable to be a little modified by the demands of the waterway or headway, or perhaps by both in combination. Whatever proportions may be ultimately allotted to the three intermediate spans, the total length of the structure is *à priori*, a known quantity. If we represent this extreme distance by L, put A for the length of the anchor spans, C for that of the cantilever arms, and S for the span of the central or suspended girder, we shall always have, in the example in Fig. 1 of a cantilever bridge with two comparatively small side anchor spans, C A and B F, and a long middle one A B, which includes the pair of cantilever arms and the suspended girder, the general equation—

$$2A + 2C + S = L \ldots\ldots\ldots\ldots (1)$$

It is evident from this expression, which is a constant for all cantilever bridges, that any serious departure in any of the three component parts A, C, or S, of the structure from the proper dimensions would greatly interfere with the design of the whole; but practically no harm has been found to accrue from the different values assigned in different bridges to these component parts. As an instance of the discrepancy that may exist between two cantilever bridges, of which the total length does not vary very considerably, we may quote a couple of American designs—viz, that over the Red River, and that over Niagara. In the former the dimensions of the relative parts are as follows, all in feet:—

$$L = 990,\ A = 165,\ C = 165,\ S = 330 \quad ..(2)$$

For the latter, the corresponding figures are:—

$$L = 920,\ A = 195,\ C = 175,\ S = 125.$$

In order to compare these dimensions with those which the best practice in the more modern examples of cantilever bridges has arrived at, they must be calculated and given respectively in terms of L, the extreme distance from end to end of each structure. Then, for the Red River bridge, we have—

$$A = 0{\cdot}1\dot{6} \times L \,.\, C = 0{\cdot}1\dot{6} \times L \,.\, S = 0{\cdot}\dot{3} \times L \,..\, (3)$$

and for that over Niagara

$$A = 0{\cdot}212 \times L \,.\, C = 0{\cdot}19 \times L \,.\, S = 0{\cdot}135 \times L \,..\, (4)$$

Employing the same notation, the proportions considered the best up to date are the following:—

$$A = 0{\cdot}225 \times L \,.\, C = 0{\cdot}112 \times L \,.\, S = 0{\cdot}322 \times L \,..\, (5)$$

It will be seen that, with the exception of the suspended span of the first example and the anchor arm of the second bridge, the agreement between the respective figures is by no means so close as it might be. In this particular instance the discrepancy should be attended to, because the value of L is always large in comparison with the other three component parts of the design which depend upon it. The celebrated Forth Bridge, with its two stupendous main spans of over 1,700ft. each, cannot be adduced as either corroborating or refuting the more modern rule respecting the proportions of all "three-span" cantilever bridges, as it does not fulfil the conditions of the case as represented in Fig. 1. It may be as well to explain a little more fully the meaning of the term "three-span" cantilever bridges, as there are many ways of subdividing the total length of the structure. Referring to Fig. 1, which shows this particular type of bridge, it will be seen that the three spans consist of a pair of anchor spans, C A, B F, and one large central span, A B, which includes the two cantilever arms and the suspended girder or truss. The three-span principle is by far that most usually employed, and has been also adopted to an equal extent in the erection of suspension bridges. Taking L in Fig. 1 to equal 1,000ft., the corresponding values of the subdivisions of the bridge, according to the theoretical data laid down, would be in feet—

$$A = 226,\ C = 114,\ S = 320 \ldots\ldots\ldots (6)$$

FIG. 1.

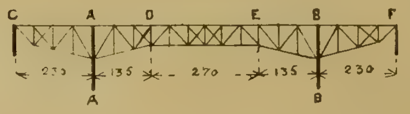


FIG. 2.

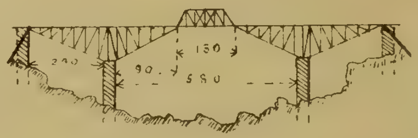
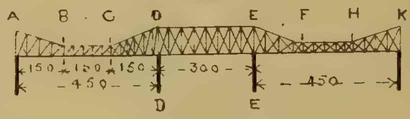


FIG. 3.



There is no doubt the rigid application of this rule makes the suspended girder too long, and the cantilever arms too short, so that it will be preferable to use a more practical and very simple formula. If we put L, A, and S as before, in 1 to 5, the equation is—

$$S = \frac{(L - 2A)}{2} \ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Or if we make P equal to the distance between the piers A and B—that is equal to the centre span, then—

$$S = 0{\cdot}5 \times P \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (8)$$

A very good proportion for the cantilever arms A D and E B is—

$$C = 0{\cdot}25 \times P \ldots\ldots\ldots\ldots\ldots (9)$$

and the correspondingly proper proportion for the length of the anchor spans can be obtained by inserting the values already found in equation (1), and solving for A we have—

$$A = \frac{L - (2C + S)}{2} \ldots\ldots\ldots\ldots (10)$$

Employing these data for calculating the lengths of the separate parts of the truss in Fig. 1, they respectively become—

$$A = 230 \,.\, C = 135 \,.\, S = 270 \ldots\ldots (11)$$

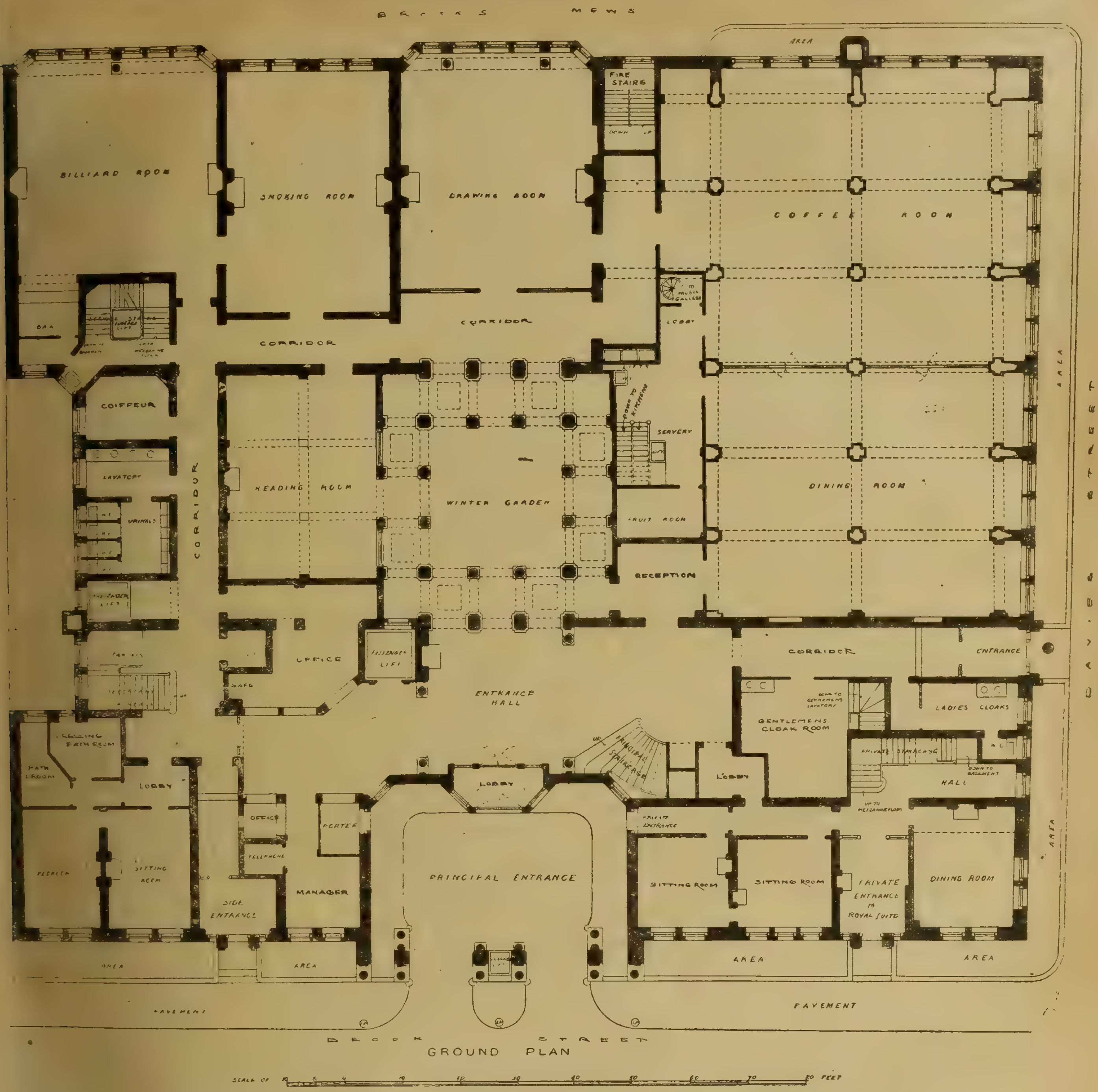
It is generally accepted that the length of the anchor arm should be about equal to 1·7 times that of the cantilever arm, and if the value of A already found be checked by this ratio, it will be found to be equal to 229·5, or practically an identity.

The object of all these analytic investigations, and the subsequent calculations respecting the various component parts of a cantilever bridge, is to arrive at the relative proportions of each part which will render the quantity of material required in the whole structure a minimum. For several reasons the conclusions come to cannot be regarded as otherwise than in the light of fairly approximate and tolerably safe guides, to be modified according to the especial requirements of each particular design, in which a good deal must necessarily be left to the ability, experience, and judgment of the designer. In the first place the amount of material—and it is considerable—which will be needed for insuring the security of the anchorage arrangements, cannot be included in the calculation. Not only will the quantity vary in different bridges, but may, and has, varied in the same structure where the nature of the anchorage ground has been completely dissimilar at each end of the bridge. The character of the bracing, whether in the web itself or whether horizontal, vertical, or diagonal in any other part of the truss, is a very doubtful quantity, although one of great importance. It has been previously pointed out that cantilever bridges are, of all other types, the greatest sinners against the assumption that the dead load may be regarded as uniformly distributed. So far as the web is concerned, especially if it be of the plate pattern, this inconsistency is not, perhaps, of any great importance, but it is otherwise with the booms or chords. These latter cannot be constructed to vary directly as they are required to do. Taking all the circumstances into consideration, there is not the slightest doubt that in numerous cantilever bridges already erected, the cantilever arms have been made longer and the suspended girder shorter than what was necessary to insure true economical results. The Forth Bridge, although not belonging to the three-span type, is nevertheless essentially built upon the cantilever principle, is a case in point. It has a suspended or central independent truss of the comparatively insignificant span of 350ft., and anchor and cantilever arms of nearly 700ft. each.

There are one or two points here in connection with the three sub-divisions A, C, and S, to which attention should be given. In the Forth Bridge itself, the dimensions of the anchor and cantilever arms, gigantic as they are, could be largely augmented if the occasion demanded it; but this is not the case with the suspended or independent truss at the middle of the main span. The longest simple trusses which have been erected are those over the river Ohio at Louisville and Cincinnati, with spans of 550ft. If, therefore, the limiting value of this type of either truss or girder be put at a span of 600ft., it will probably not be far from its ultimate capabilities. Consequently any difference, when this limited span is reached, between the total length of the main span and that of the suspended girder, must be made up by the two cantilever arms. Putting P as before for the main span, the length of each cantilever arm will be—

$$C = \frac{(P - S)}{2} \ldots\ldots\ldots\ldots (12)$$

It is not intended at present to enter into the general subject of the deflection of cantilever bridges; but it may be remarked, with respect to the influence which the parts A, C, and S exercise upon this feature, that this type of construction is *per se* weak in point of rigidity in comparison with other structural systems. It requires a large amount of lateral bracing especially to resist the pressure of the wind. It has always been found by actual test-loads, and an inspection of Fig. I will point out that the result might be anticipated, that the maximum vertical deflection at the points D and E, where the junction of the suspended truss and the cantilever arms occur, is great, and that this deflection is proportional to the ratio existing between the length of the suspended girder and the total length of the bridge. In one instance in which the suspended girder was comparatively short, and the cantilever arm correspondingly long, a measured deflection was reduced to one-third of its original dimension in a structure under



GROUND PLAN, CLARIDGE'S HOTEL.—C. W. Stephens, *Architect.*

similar conditions, but with the proportions of these two component parts reversed. This experiment points conclusively to the fact that the length of the cantilever arms is the most important factor in determining the maximum deflection of the bridge. In other words, the shorter the cantilever arm, provided always that the other rules governing its length be fairly adhered to, the stiffer the structure. Probably the most eligible site for a three-span cantilever bridge would be over a ravine, or where a river similar to the "lordly Wharf" is pent up with rocks on either side. This natural configuration, as shown in the skeleton design in Fig. 2, would offer great advantages for the anchorage of the side spans, as good holding ground would be readily accessible at a very small depth on the banks of the chasm or rocky gorge. A site similar to that just described is equally well adapted to insure economy in the foundations of the piers and abutments of the intended structure, and also to secure that immovability in the supports which is another assumption, and one not always obtained, so desirable in the construction of bridges of all types and classes. In this last requirement the cantilever system scores off its *confrères*, as any slight variation in the level of the support does not bring about corresponding alterations worth noticing in the calculated stresses.

In previous articles, descriptions and illustrations have been given of the different forms to which the cantilever principle can be applied, according to the local conditions and circumstances attending particular examples, each of which calls for a different style of elevation. The design shown in Fig. 3, which has been adopted for railway bridges with considerable success in the United States, is not at all different in many respects from those to which reference has been made.

Instead of the usual suspender girder in the middle of the central span, a long truss C D E F is introduced, which not only covers the main span between the piers D and E, but is continuous over them, and throws out on each side cantilever arms C D and E F. Between these and the anchor arms A B and H K the suspended girders B C and F H are carried, the anchoring down of the side spans being effected in the ordinary way. This design will be found very useful in those instances in which it is desirable to have large side spans, as sometimes becomes necessary. It is well known that the greatest depth of water available in rivers is by no means invariably situated in the mid axis of the stream. In our next article the stresses upon the suspended girder will be investigated and determined, and the results checked by one or other of the independent modes of analysis available for the purpose.

T. C.

CLARIDGE'S NEW HOTEL.

Recently we gave a view of this important addition to the big hotels of London, and we printed a general description of the work. We complete the matter to-day by giving a copy of the ground-plan showing the replete arrangements of one of the most convenient establishments of the higher class in the Metropolis. The entrance-hall opens into a winter garden or cortile, to the right of which is the big coffee and dining-room. To the left is a reading-room, and directly facing the entrance beyond the winter garden is the drawing-room. The Royal suite has an entrance of its own, and there are private suites of rooms complete in themselves. The billiard-room and smoking-room are conveniently isolated, and a bar service is handy for their use. A great feature is made of the principal entrance. Mr. C. W. Stephens is the architect.

* * *

Mr. Hubert Schroder, head master of the Bournemouth Technical School, has been appointed Art Master to the Hartley Institution, Southampton, in the place of Mr. C. Tattersall Dodd.

BRIDGE CONSTRUCTION.

THE Washington aqueduct, which was commenced in 1853 and completed in 1898, is an important work undertaken to supply the City of Washington with water. We now refer to one important structure described in the *Engineering Record*, the single-span masonry arch known as the "Cabin John Bridge" across the creek of that name. The single-span structure is 220ft. span, designed by Alfred L. Rives, an assistant to Captain Meigs, was commenced in 1857. The curve of this arch is a segment of 110°, with a radius of soffit of 134·28ft., and a rise of 57·26ft. The extrados is a continuous circular curve. The arch of soffit is of granite, and outside this is a rubble arch, the face stones of rock-faced ashlar, and the extrados is cut in steps to avoid sharp points in the horizontal courses. The main arch springs from heavy blocks of dressed granite, resting on the concrete bed which covers the rock. The granite arch stones were set on wedges, and afterwards grouted with pure Rosendale cement. Details are given in the *Record* of the centre used in the construction. The curved rib is of two thicknesses of 12in. by 4in. plank, and the lagging is of one 4in. by 12in. timber, supported on folding wedges under each course of voussoirs. The diagonal and vertical suspending pieces are planks supporting the middle point of the long lower longitudinal timber under compression. Details of these parts are given in the *Record*. The granite arch was completed in 1858, and the rubble arch turned, and the bridge was completed to the coping in 1864; the graphical analysis of the arch ring and backing giving the stresses according to Mery's method is of interest. Another important structure in connection with this aqueduct is a cast-iron pipe arch, 200ft. span, segmental in shape, of pipes 4ft. in diameter. These were laid in line of the Pennsylvania-avenue, and a roadway was formed on the pipe arch, carried by iron spandrel bracing resting on the arch. The pipes were cast straight, with bevelled flanges, planed and put together with paper and red-lead. The stress diagram given shows a thrust of 71,000lb., and a resultant in the line of pressure within the pipe arch of 79,700lb. Full details of the pipes carried over Rock Canal between Georgetown and Washington are given, also of the waste weirs, receiving reservoirs, &c. The length of the conduit is eleven miles. Of the main conduit, 4,364ft. is in rough inclined tunnels in rock, and 3,500ft. is 9ft. 9in. diameter without brick lining. A large part of the conduit is built of rough rubble stone, plastered smooth on the inside.

THE DERRICK v. SCAFFOLDING.

ANYONE who attentively observes a large building in course of present construction cannot fail to come to the conclusion that its erection is accomplished by the employment of means and appliances which, although not altogether novel, can fairly lay claim to being of very modern introduction. The old cumbersome system of scaffolding, with its inevitable accompaniment of vertical ladders, short and steep ramps, tedious manual devices for raising and lowering materials, forest of timber poles and treacherous planks, is fast disappearing. One essential difference, which draws the line of demarcation between the employment of scaffolding and of the derrick is that the former is always erected exterior to the building and the latter interior to it. This remark does not apply to the light staging put up along the inside of brick walls which are of too great a thickness to be built overhand. The term "derrick" is used in a generic sense, and partakes very much of the properties of the ordinary crane. In both, the angle of the jib or boom is sometimes fixed, but more often alterable at will so as to increase or decrease the radius of rotation, or the sweep, as may be required. The post also in both examples of hoisting apparatus may be either solidly imbedded in the foundation or retained in position by guys or back-stays. One of the best, simplest, and most efficient little lifting machine of this description is to be seen daily at work on the north-east side of the city approach to Blackfriars Bridge. It consists of a solid plate iron bent arm uniting jib and post in one single piece, firmly anchored to a solid bed-plate, without the aid of tie-rods or back-stays of any description. In the early designs of these lifting and lowering appliances, the preference was given to the plate type of construction; but latterly the lattice or open-web system has been adopted with remarkable success, as may be gathered from the fact that cranes have been erected on the latter principle with a working hoisting power of 150 tons.

It must not be supposed that while in a great measure usurping the functions of the older forms of scaffolding, the crane can dispense with it altogether. On the contrary, it frequently requires the assistance of some very strong and heavy scaffolding to form supports for it in order to fix it securely in position. These supports, which are erected within the area of the building, usually consist of square or rectangular frames, constructed of four vertical posts of either whole or half-timbers, according to their height and the weight they have to carry. The total height is divided at intervals into separate lengths by four horizontal waling pieces, one between each pair of posts, and strongly braced together by diagonal ties in both vertical and horizontal planes. Perched upon the summit of one of these four-posted trusses, and solidly anchored down to it, a derrick with a long radius or sweep of jib can lift the largest stones and deposit them in any position required with an amount of accuracy and precision which is almost tantamount to actually laying them and dispensing with the aid of the mason. A very fine example of a timber-crane erected in a similar lofty and commanding position was used in the building of the Princess of Wales Theatre recently opened at Kennington. Another instance of the employment of cranes to the total exclusion of all exterior scaffolding is afforded by the new gaol nearly completed in New York, in the construction of which four were fixed up and swung from massive rectangular trussed frames of the description mentioned. All necessary ladders, staging, and gangways for the accommodation of the workmen were put up within the area of the building.

It is a curious fact that Chinese coolies and workmen will not go up and down ladders. Possibly this repugnance is partially due to the circumstance that they work barefooted; but that supposition will not altogether account for it, because workmen of other nationalities will use them, who equally do not wear any footgear. The Chinese obtain access to the various stages of any building in course of erection by a series of ramps with a serene and impassive indifference to the length of them, or in whose property they may tail out. It may be mentioned that the derrick was employed with great advantage in the building of the Eiffel Tower, which is exactly a thousand feet high, and also in the construction of the American "sky-scrapers." The last of these stupendous edifices of twenty-nine stories has a height above ground of 391ft., and of 440ft. from the same level to the base of the flagstaff. An adequate idea of these dimensions as applied to dwelling-houses may be gathered, when it is remembered that the height of St. Paul's Cathedral is but 360ft. from the street-level to the cross.

T. C.

RIVER-WALL CONSTRUCTION.

SEVERAL methods of constructing sea-fronts are practised in America. In New York the river-wall consists of concrete blocks built as a retaining wall. The blocks vary in size, but are generally 12ft. in length, 15ft. high, and a 7ft. width at base, diminishing to 5ft. at the top. The foundations are in some cases formed of bags of concrete laid on the rock bottom; in other cases piles are used, sawn off some 12ft. below low water by a circular saw. Mattresses of "burlap" with concrete filled in between the pile-heads and the concrete blocks are used. The concrete blocks are faced with blocks of cut granite laid in cement mortar from about 2ft. below low water to 4ft. above high water. These facing blocks, 6ft. long, 2ft. to 4ft. wide, and 2ft. deep, are in headers and stretchers, and are laid in benches cut in the face of concrete. The outer and inner faces of this wall are protected by a sloping wall of riprap.

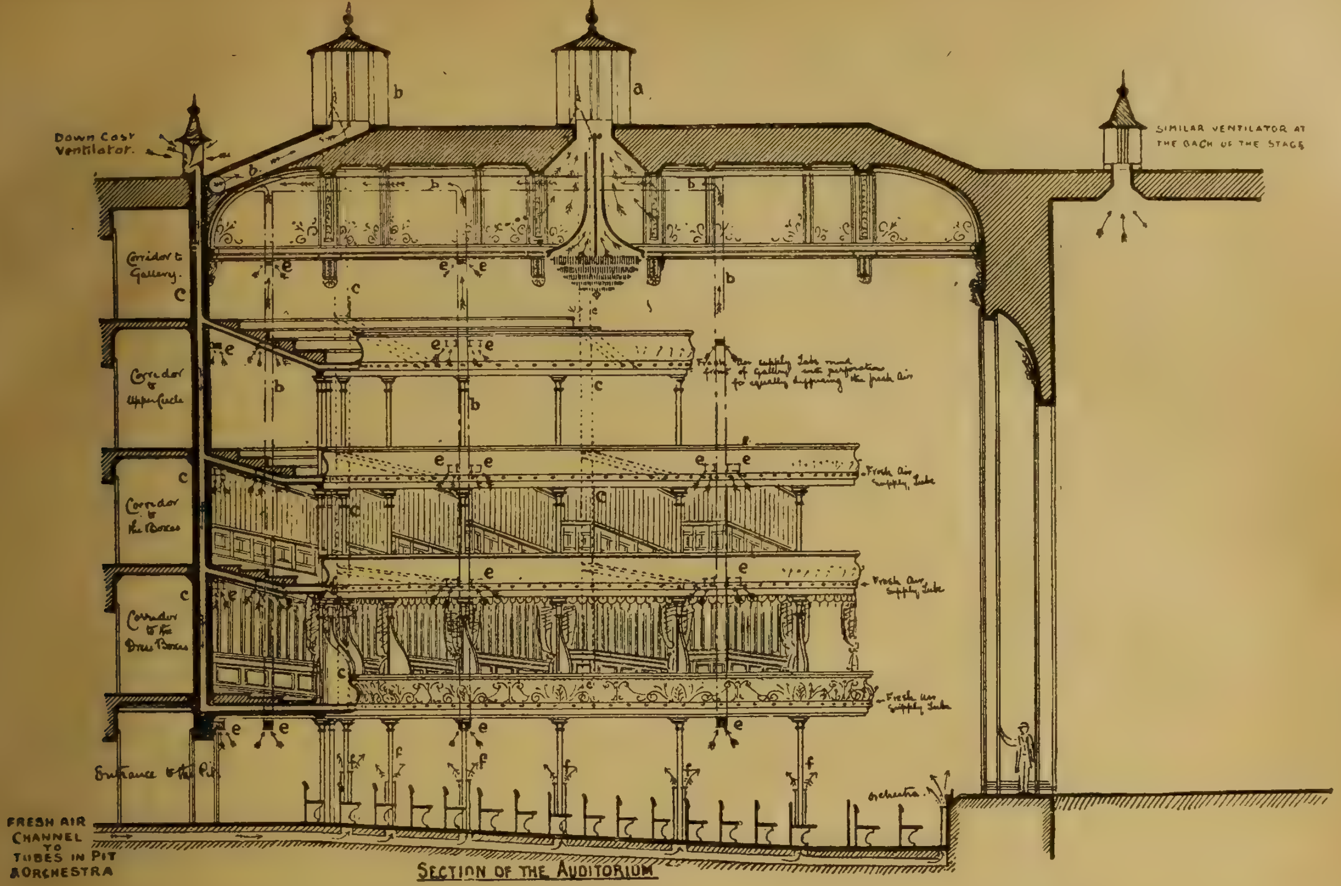
The sea-front at Philadelphia, just commenced, is thus described:—Four rows of piles are driven about 3ft. apart and 4ft. longitudinally. These are sawn off 10ft. below low water, and the trench is filled with gravel to the top of the piles, forming an embankment 10ft. wide, and having a slope on each side of $1\frac{1}{2}$ to 1. A concrete mattress is then placed to cover the area of the bottom layer of wall and on the heads of the piles. The concrete blocks are in three tiers of the following sizes — the lowest are 12ft. long at base and 10ft. at the top, 8ft. wide, and 5ft. 6in. thick; the second tier of blocks are 9ft. long at base, 7ft. at the top, 8ft. wide, and 6ft. 6in. high; and the upper blocks are 6ft. wide at base, 3ft. wide at top, 10ft. high, and made in continuous lengths of 72ft., with expansion joints at that interval. Outside there is a batter of 1in. to a foot, and the outer surface is plastered with a granolithic mixture with a smooth surface. This retaining wall is anchored to piles clamped together and braced by a 2in. wrought-iron rod at each bent 8ft. apart, the end fastened to a rod imbedded in the lower block. Other sea-walls, as one in San Francisco, are built of continuous retaining walls of concrete 12ft. wide at the base and 6ft. at the top, and 18ft. in height, with an outer batter in the whole height of 1ft., and the back of wall formed into steps or benches. The wall rests on a grillage or platform 14ft. wide, supported on piles driven 4ft. from centres in both directions. For further particulars we refer the reader to a report to the Board of State Harbour Commissioners of California, by Mr. H. C. Holmes, noticed in the *Engineering Record*.

FIRE TESTS OF FLOORS AND PARTITIONS.

TWO more reports of the British Fire Prevention Committee are before us. One of them describes particulars of an experimental fire-test on a floor of steel joists filled in with concrete on corrugated iron with a suspended ceiling. The floor tested was 10ft. by 10ft., loaded with 168lb. per square foot. The fire was of an hour and a quarter's duration, and gradually increased to a temperature of 2,000° Fahr., followed by the application of a stream of water and consequent rapid cooling. The suspended ceiling fell during the test, the floor deflected $2\frac{3}{4}$in. in the centre, but afterwards returned to within 1in. of level, and the concrete was found slightly disintegrated on the underside. The floor was otherwise intact, and no fire passed through it. The sections show an ordinary floor I steel joists, 3ft. centres, 7in. by $3\frac{3}{4}$in.; the centring was of 32 gauge corrugated iron sheets resting on bottom flanges of joists, and overlapping $1\frac{1}{2}$in. to $2\frac{1}{2}$in. Ceiling joists 2in. by 3in. were secured to lower flanges by iron hooks, and were placed 16in. apart (centres). The concrete filling was composed of clean coke breeze, 5 parts to 1 of Portland cement, mixed four times dry and four times wet, and was rammed down. The wire lathing $\frac{1}{16}$in. thick, $\frac{1}{2}$in. mesh, was secured to ceiling joists by iron staples, and the plastering consisted of a "pricking-up" coat with two other coats of 2 parts of washed sand and 1 of lime putty. A full account of the test is given in the committee's report, with details of the construction.

The fire-test with partitions, one of lath and plaster, and the other a brick-nogged partition of 3in. (brick on edge) and 4in. brick flat, which partitions are illustrated by photographic reproductions, is of much importance in testing the relative values of these constructions. There were four kinds of partitions experimented upon. The first was a lath-and-plaster partition, one with wood lathing and the other with plain wire lathing; the brick nog partitions were of brick on edge and brick flat. Each partition had an area of 7ft. 6in. by 3ft. 6in., or 26ft. superficial. The lath-and-plaster partition under the effect of a fierce fire of one hour's duration, increasing to 1,900° Fahr., followed by a sudden application of water for three minutes, was practically destroyed. The fire broke through the plastering on wood lath in 28 minutes at about 1,000° Fahr., and through the wire lathing in 40 minutes at about 1,750°. The brick nogged partition resisted the fire for the hour, although the plastering was disintegrated and studs charred. The temperature was 2,000°. The lath-and-plaster partition had 2in. by 4in. studs, head and sill, with one row of 2in. by 4in. bridging, and the studs were 16in. centre to centre. One end was lathed with $\frac{1}{16}$in. or $\frac{1}{2}$in. mesh wire lathing, secured to studs by iron staples, and the other end was lathed by fir laths $\frac{1}{8}$in. by $1\frac{1}{4}$in. and $\frac{3}{8}$in. apart, butt-jointed and nailed with 8in. wire nails. The plastering (first coat) was of ordinary pit sand and grey-stone lime, one yard to quarter yard, and 21lb. of cow's hair. The last coat was of two parts washed sand and one part lime putty, and the total thickness of plaster $\frac{7}{8}$in.

The brick nogged partitions were made with


Down Cast Ventilator.
b
a
b
SIMILAR VENTILATOR AT THE BACK OF THE STAGE
Corridor to Gallery.
C
Corridor to Upper Circle
Corridor to the Boxes
Corridor to the Dress Boxes
c
e
f
Fresh air supply tube round front of gallery with perforation to equally diffusing the fresh air
Fresh Air supply tube
Fresh Air supply tube
Fresh air supply tube
Entrance to the Pit
Orchestra
FRESH AIR CHANNEL TO TUBES IN PIT & ORCHESTRA
SECTION OF THE AUDITORIUM

A NATURAL SYSTEM OF VENTILATION AS APPLIED TO A THEATRE.

a, Ventilator over chandelier and large opening in centre of ceiling of auditorium. *b*, Ventilator connected with flues (No. 3) built in walls, with openings and ornamental gratings under ceilings of galleries and in each of the boxes. *c*, Downcast ventilator for the supply of pure fresh air, connected with flues (No. 8) in walls and iron tubes under floors of boxes and galleries, discharging through perforated tubes in front of same. *d*, Ventilator (No. 2) over stage. *e*, Foul air exits into extraction flues in walls. *f*, Fresh air admitted round columns in pit. Note.—The fresh air is cleansed and purified before entering, and may be warmed or cooled as required.

3in. by 2in. and 4in. by 2in. studs, 20in. centre to centre on the head and side, with a row of bridging, and the partitions were filled with bricks laid flat and on edge in mortar, and plastered in a similar manner and of the same materials and thickness. The illustrations and details given in these reports afford every particular, and we recommend these last published reports to the attention of all architects.

Mr. Edwin O. Sachs, in a note, observes, "The partitions showed intact vertical surfaces from floor to ceiling, and as there were no skirting, the plastering did not stop short behind, as is too often the case in ordinary work." This is indeed the weak point in most partitions, and the long resistance of the partitions in these lists is attributed justly to the absence of this interruption of the plaster surface. The reports are obtainable at the Committee's Offices, 1, Waterloo-place, Pall Mall.

* * *

NATURAL VENTILATION.—II.

By Robert Boyle.

[All rights reserved.]

A SCIENTIFICALLY-ARRANGED "natural" system of ventilation utilises the never-ceasing movement or natural force which exists in the air as an unfailing motive-power, and also the difference in temperature of the internal and external atmosphere. As applied to buildings, it consists of updraught ventilators which remove the pressure of the external air from the top of the outlet shafts, and create, under all conditions of the weather, a continuous and powerful exhaust at the higher parts of the building; combined with specially-constructed air-inlets fixed at the lower levels, admitting the air directly through the walls in an upward direction at a low velocity, purified and warmed or cooled as required, insuring a constant change of air and perfect diffusion of the fresh supply in strict accordance with the natural laws which govern ventilation. The higher temperature in an occupied building—particularly in cold weather, when doors and window are kept closed to prevent draught, combined with the ascensional movement of the heated air arising from the lungs and body, are also utilised as powerful and never-failing auxiliaries in changing the air and inducing an inward and upward current even when there is absolutely no perceptible movement of the air outside. "As the warm air expands it ascends; as the warm air ascends the air around rushes in to fill its place"—(Galton.)

A scientific system of natural ventilation may be described as the application of means by which the natural laws of ventilation can be effectively brought into operation, the power which operates in producing the currents and change of air being as constant as gravity. Houghton says: "Science proves that there is not a moment of time but when there is a movement of the air, and that this movement, properly utilised, is sufficient at all times to change the air in a building and secure ventilation." Parkes, in "A Manual of Hygiene," confirms this. "Incessant movement of the air," says Parkes, "is a law of nature. We have only to allow the air in our cities and dwellings to take share in this constant change, and ventilation will go on uninterruptedly without our care. In this country, and, indeed, in most countries, even comparative quiescence of the air for more than a few hours is scarcely known. Air is called 'still' when it is really moving 1 or 1½ miles an hour. Advantage, therefore, can be taken of this aspirating power of the wind to cause a movement of the air up a tube."

Dr. Hayward gives the scientific explanation of how efficient ventilation may be obtained, at all times, by natural means.

"That efficient ventilation can ever be automatic and costless" (says Dr. Hayward), "may, perhaps, appear absurd; it is, however, not so absurd as it may appear. This will be evident by reference to the natural laws of atmospheric pressure and of its expansion by heat. In fact, the idea that the atmosphere cannot be caused to pass through a building at a rate of emptying and replenishing every twenty minutes, by having the inside warm and the outside cold, with sufficient openings at the bottom and top, is itself absurd to anyone familiar with dynamics. The outside air presses in through the inlets, and the inside air presses out through the outlets at a speed determined by the difference in weight—that is, in winter, a difference between air averaging about 35° F., or lower, and about 65° F. or higher.

"Now, according to the laws of atmospheric pressure, this difference produces a speed of at least 8ft. per second, in ordinary flues or chimneys (See Blue-book, page 6).

"'The ventilation of rooms and buildings,' say the Government Commissioners, 'depends in a great measure upon the ascending and descending currents of air caused by the difference in temperature, the warmer air ascending and the colder and heavier descending, the greater the difference of temperature the greater being the difference of weight and of the rapidity of interchange. A cubic foot of air at 30° F. weighs 569·2 grains; at 70° F. weighs 526·2 grains; making a difference of 43·0 grains for the 40° under the same atmospheric pressure—viz., 30in. of mercury.' (Blue-book, pp. 5, 6.) 'This difference in weight produces a speed of at least 10ft. per second in ordinary flues or chimneys.'"

The advantages of a natural system of ventilation are (1) The warm vitiated air is continuously drawn off, as fast as it is generated, at the highest point whereto it naturally ascends, an equivalent supply of fresh air entering at the lower levels through specially arranged inlets. (2) Efficiency is secured in every season of the year, and in all conditions of the weather—in the coldest and foggiest day in winter and the closest and warmest day in summer. (3) The fresh-air supply is admitted at a *low* velocity directly through the walls in an upward direction, and is thoroughly purified and warmed or cooled as required. (4) The special construction of the air-inlet openings, gratings, and tubes completely prevents the lodgment or accumulation of dust. They are also easily accessible for cleansing purposes. The importance of these features cannot be overrated. (5) The air in a building is kept perfectly clear and pure even when there is a dense fog outside. (6) It is always in action day and night, and can never get out of order or break down, there being no movable parts. (7) It requires the minimum of attention, and is under perfect control. (8) It can be installed at a fraction of the cost of artificial methods, and there is little or no after expense for maintenance.

Natural ventilation generally fails—(1) When owing to a mistaken spirit of economy a complete system is not adopted; (2) where the outlet and inlet ventilators are insufficient in size and number, and not properly proportioned to each other; (3) where the ventilators are of defective make or are unskilfully arranged in their relation to each other.

De Chaumont holds that "It is essential to the success of a natural system of ventilation that both the outlet and inlet ventilators be of correct construction and skilfully applied. Where this is not observed failure generally ensues with this form of ventilation." Whilst Houghton says: "My experience is that a natural system of ventilation is in the long run the most reliable and satisfactory, provided, of course, that properly-constructed ventilators are employed, and that they are skilfully applied by a competent engineer. I am quite aware that there are many very indifferent ventilators in existence, and also incompetent persons who style themselves "ventilating engineers," and that natural ventilation under such auspices might, and probably would, prove a failure."

(*To be continued.*)

CROSS-RIVER COMMUNICATION.

THE people of Newport are desirous of adopting some up-to-date method of cross-river communication over the Usk, and the Harbour Commissioners last week despatched a deputation to Rouen to see what the authorities of that town are doing. They are erecting a "transbordeur' over the Seine, from the designs of M. Arnodin, the French engineer, who gave all information in his power. It had been decided that the best course to be pursued would be to allow the borough engineer (Mr. R. H. Haynes) to put to M. Arnodin a series of questions, with a view to obtaining from him all the general and technical information which the Council and the Harbour Commissioners might require. The questions were put in English, and Alderman T. Jones and Councillor T. Canning interpreted them into French, and the French answers into English.

The bridge at Rouen consists of two high towers of open lattice girder work, 229ft. high, with what is in reality a suspension bridge from side to side, at a height of 164ft. above the quay. Passing over the top of the towers, and moored to anchorages of solid masonry on each side, are stout steel wire cables, which support the centre of the bridge. On each side of the bridge, 164ft. above the water, are footways, protected on one side by a hand-rail, on the other by the outer girders, and by these pedestrians can cross the Seine. These footways are approached by 14 ladders and platforms, properly supported and protected, on the outside of the tower; but in reality, these are no part of the principle of the transbordeur, the distinctive feature of which is that passengers are carried across the Seine, at the level of the quay, in a car suspended (by long steel wire cables) from a platform which runs on low rollers, the girders under the footway serving as rails. The movement of the car, I was informed, was controlled by two 25H.P. motors, which are direct-coupled through cog-wheel gearing to a winding drum. The winding-drum motors are fixed on the car, the hauling rope being attached to the top of the two towers. The rope is trailed along the suspended portion of the structure, and the bight or loop passes over and between a pair of rollers which are carried by the frame running on the bottom of the suspended rollers. This loop hangs down from the suspended girder to the winding drum fixed on the top of the platform, and as the loop is wound on so the car travels towards the other fixed end. It should be mentioned that M. Arnodin's work has been somewhat delayed, so that the Newport deputation did not inspect a completely finished bridge opened to the public nad plying for hire. This would have been an advantage had it been possible, but, as it was, they had every opportunity of testing the capabilities of the bridge, for it was complete in all essentials, and only the finishing touches are required. Thus, for instance, at the given word the car started on its journey across the Seine,

RUNNING SMOOTHLY AND SAFELY.

The span of the Rouen transbordeur is 466ft.—about 200ft. less than would be required at Newport if the principle were adopted and applied at Brithdir Wharf, which is regarded as the best available site. The first journey across was made in 1min. 25sec., and after the distance was traversed in 1min. 5sec.; but no effort was made to put on a big pace, and the electrician of the bridge held that he could get the car across in 45sec. if necessary. The car platform is about 36ft. long, and, say, 42ft. 8in. wide. On each side is a car for passengers, and the centre is laid with tram-rails, and is intended for the accommodation of tram-cars and other vehicles. A horse and cart were taken across, the car was stopped and reversed in a couple of seconds, and it was shown that it was so absolutely under control that there would be no difficulty whatever in avoiding an approaching steamer. It may be mentioned that at high spring tides the car just clears the water, while the rise and fall of the tide is said to be from 4ft. to 5ft., but that point is not quite clear. At present the car goes right up to the quay; but proper buffers will be provided, and even now there is no difficulty in bringing it to a standstill without disturbing the passengers. The car and the cables which support it weigh 45 tons, the outside load of the car is put at 64 tons, so that the test strain of the bridge, which has yet to be applied, is 104 tons. However, the average load for the car and platform is estimated at 15 tons, so that the normal weight the bridge will have to bear is 60 tons. It may be mentioned, however, that in examining the towers and the anchorages a question was put as to whether it would not have been better to have had the base of the tower deeper, and the anchorage piers more distant—they are 905ft. apart—and M. Arnodin frankly confessed that had, not the street prevented it, he would have increased the distance, though, of course, he considered the present anchorages

WELL WITHIN THE LIMITS OF SAFETY.

The anchorage piers each contain 620 cubic mètres, and over these the great cables are strained, secured to girders which are imbedded in the masonry. There are about 1,600 tons of metal in the bridge and cables, and on the inner side the towers are founded on the quay, while on the outer side the foundations are of piles driven through the alluvial mud to the chalk, over which concrete and masonry is raised. The Rouen bridge has actually cost only £40,000, though it must be understood that this does not include remuneration for M. Arnodin, who is engineer and contractor, and has built the bridge as a personal private speculation. A bridge at Newport is estimated to cost £60,000.

CHIPS.

The "christening" of the new works and machinery at the Victoria Spinning Mills, Rochdale, took place last Wednesday week. The architects were the late Mr. John Stott and Messrs. Smith and Cross.

The new ornamental recreation-ground bought by the Ashford Urban District Council was opened to the public for the first time on Saturday. It contains 17 acres, or six acres more than the old ground, which is being sold for building purposes.

The death is announced of Mr. William Bage, one of the first masters of civil engineering of the Melbourne University, and a leading member of his profession in Melbourne. Mr. Bage came of an engineering family. His father, the late Mr. Edward Bage, was selected, on the recommendation of Sir Isambard Brunel, to construct and work the Taff Vale Railway in the early days of railway engineering.

Arrangements are being made for an important Art and Industrial Exhibition to be held at the Drill Hall during the last week of September, in connection with the Peterborough School of Science and Art.

A deed of assignment for the benefit of creditors has been executed by Moses White, plumber, 21, Albion-street, Hanley, under which Mr. A. E. Wayte, accountant, Hanley, is trustee. The unsecured liabilities are returned at £163, and the assets, after deducting the claims of preferential creditors payable in full, are estimated at £80.

LEGAL INTELLIGENCE.

New Brighton Tower.—Easton, Anderson, and Goolden, Limited, v. New Brighton Tower, &c., Company.—The hearing was concluded last Friday in the Queen's Bench Division, before Mr. Justice Day and a special jury, of this action, which was brought by Messrs. Easton, Anderson, and Goolden, Limited, engineers, against the New Brighton Tower, &c., Company, to recover £4,100, the price of certain electrical lifts supplied and fixed at defendants' tower at New Brighton, £407 for a pump, and £247 in respect of extras. It appeared that in the autumn of 1897 the defendants were engaged in erecting at New Brighton a large tower, some 400ft. high, and the plaintiffs contracted to supply and fix two main electrical lifts to run up the centre of the tower to the top, and two auxiliary lifts to run up to the 80ft. level. They also undertook to have the lifts running a week before Easter Monday, 1898, or earlier, if possible, provided that they were not delayed by anything out of their control. Plaintiffs stated that, owing to the work at the tower not being sufficiently advanced, they were unable to complete their contract until August 1. Defendants admitted that the lifts and pump were supplied, but contended that the plaintiffs were responsible for the delay in fixing the lifts. In consequence of this delay, defendants said that the shops at the top of the tower and on the 80ft. level could not be used, and the persons who had taken them had to be compensated. The public were also prevented from visiting the tower, and defendants contended that they had sustained damages to the extent of £5,264, for which they counter-claimed. In the result the parties agreed that judgment should be entered for the plaintiffs for the amount claimed, and for the defendants on the counter-claim for £600. Judgment accordingly.

Breaches of the New Quarry Regulations.—At Rochester County Police-court, on Tuesday, Messrs. Trechmann, Weekes, and Co. (Limited), cement manufacturers, of Halling, near Rochester, were summoned for breaches of the special rules established under the Quarries Act, 1894, in relation to a chalk quarry connected with their works. There were four summonses for not providing (1) locked boxes for explosives when not in actual use, (2) shelters for the use of the men during blasting operations, (3) framed regulations as to intervals and signals, and (4) a daily report of the condition of the plant, machinery, and appliances at the quarry. Defendants pleaded "Guilty," but said that the requirements of the Home Office had been met since. The magistrates considered that the defendants had been distinctly careless; but as the rules had not been in operation very long, and this was the first case they had had before them, they would only impose small fines. They ordered the defendants to pay fines and costs amounting in the aggregate to £23 16s.

A Gas Company's Unsuccessful Libel Action.—In the Queen's Bench Division, last Friday, Mr. Justice Day and a special jury heard a case in which the Ilford Gas Light and Coke Company sued Mr. W. A. Locke, proprietor of the *Ilford Guardian*, for damages for libel, which the plaintiffs said imputed that they had increased the pressure of gas in their mains in order that the bills of consumers might be increased, that they (the company) might receive more compensation in the event of their undertaking being bought by the local council. The plaintiffs said there was no foundation for these charges. The defendant said the article was fair comment on a matter of public interest, and added that about the time the article was written there were numerous complaints by consumers that they had been charged for gas which they had not consumed. A verdict was entered for the defendant, and judgment was given accordingly, with costs.

A Seaview Builder's Unprofitable Trading.—Re Henry Edwards Matthews, of Seaview, Builder.—The debtor's statement showed gross liabilities amounting to £5,070 14s. 2d., and deducting from this amount the claims of creditors secured or partly secured there was left an estimated sum of £2,226 16s. 8d. to rank for dividend. The available assets were set out at £232 0s. 5d., leaving a deficiency of £1,994 16s. 3d. The Deputy Official Receiver said he must ask for an adjournment in order that a complete deficiency account might be filed. The Registrar ordered the debtor to furnish the account required by the 11th inst., and he adjourned the examination to the 14th.

New Catholic Church at Omagh.—Contractor's Claim for Damages.—Last week at Derry County Assizes, Mr. Justice Kenny and a special jury were engaged in the hearing of the record Colhoun v. M'Namee and others. The plaintiff, Joseph Colhoun, builder and contractor, Strand-road, Derry, sued Right Rev. Monsignor M'Namee, P.P., V.F., Omagh, and others, constituting the church committee, claiming £3,330 5s. 5d. for work done, services rendered, and materials provided in connection with the building of the Catholic Cathedral, Omagh. He also claimed £1,030 9s. 9d. as damages for breach of contract, and in the alternative claimed a like amount for being wrongfully prevented from completing the contract. In his statement of claim plaintiff averred that he had always been ready and willing to carry out his agreement with the defendants, and that he had suffered damage in consequence of the breach of the agreement by the defendants in failing to give him the necessary instructions and directions to carry on the work, and obstructing, hindering, and unreasonably delaying him in its execution. According to him, he was entitled to £18,514 1s. 1d. for the building of the church. He had been paid £15,300 on account, and he averred that the balance, £3,214 1s. 1d. remained due. He claimed 4 per cent. interest on this amount from Nov. 24 last, and £54 11s. 8d. in respect of plant. The defendants, in the statement of defence, pleaded that they did not admit the allegations contained in the plaintiff's statement of claim; that they complied with all their terms and conditions, whether expressed or implied, in connection with the said contract, and did not obstruct or delay the plaintiff in the execution of said agreement. They also pleaded that it was a term of the contract that all work was to be done under the supervision of their architect, the late Mr. Wm. Hague, of Dublin, and that payments were to be made from time to time upon certificates given by the said Mr. Hague. They further pleaded that the contract price was £17,000, out of which certificates had been granted and sums paid amounting to £15,000, and they brought the balance of £2,366 into court, and maintained that sum was sufficient to satisfy plaintiff's cause of action. His Lordship, in charging the jury, said the plaintiff in the present cause of action was a well-known builder and contractor in the North of Ireland, and the particular defendant in the case, Right Rev. Monsignor M'Namee, although personally unknown to his lordship, was, from all he had heard of him since he came upon the North-West circuit, a clergyman who was thoroughly respected and esteemed in the town of Omagh. The other defendants in the case were a committee of gentlemen who were associated with Monsignor M'Namee in endeavouring to erect this handsome church. In addition to the other pleas that had been put upon the file by the plaintiff, Mr. Colhoun, it was thought necessary—though perhaps it had not emanated from Mr. Colhoun—it was thought necessary to make an allegation which was an allegation of pure and simple fraud against Monsignor M'Namee and the gentlemen forming this committee. That allegation of fraud could not be discussed in any other form of words but this, that the committee, headed by Monsignor M'Namee, combined with Mr. Hague, who was their architect, for the purpose of obtaining for their own ends and for the purpose of depriving Mr. Colhoun of earning moneys which he might legitimately earn in the contract, and that they combined to get that certificate from Mr. Hague to put Mr. Colhoun out in August, 1898. His Lordship wished that plea had not been put on the file. On the 12th May, 1893, there was a letter of Mr. Hague's in evidence in which he served notice to determine this contract. On the 21st of May, 1898, he actually served notice, and on the 1st July he served another notice. None of those notices were acted on, and it was not until the 6th August, 1898, that the final notice was served, and the building taken possession of. The person who could have given some information with reference to Mr. Colhoun's claim (Mr. Hague) was unfortunately dead, and the statement with reference to the time the plaintiff commenced his action was perfectly just. Plaintiff did not wait until Mr. Hague was either sick or dead. The action was commenced during Mr. Hague's lifetime and was on the list for trial at the last Spring Assizes, and it was on the application of the defendants to the effect that Mr. Hague was seriously ill that the trial was adjourned. In Mr. Hague's absence it was impossible for them to say what actuated him in putting down some of the figures, particularly the £500 which had been so much commented upon by counsel for the plaintiff. In the year 1892 tenders had been advertised for to construct this church, and Mr. Colhoun was declared the contractor in September, 1892, to have the work completed in September, 1894. Monsignor M'Namee stated that Mr. Colhoun wanted a further extension of time to December of the year 1894, but that he (Monsignor M'Namee) refused to allow more than two years for the completion of the contract. Mr. Colhoun went on with his work, and two further contracts were entered into; one in September, 1895, for £1,835, which his Lordship held, with Mr. Drummond, to be a contract, and the other in the month of May, 1897, for £1,150, for the raising of the tower an additional height of 10ft. It was expressly stipulated in the agreement that that work was to be completed in six months. Mr. Colhoun says that it was completed. Monsignor M'Namee says that it was not. At any rate the contract was accepted, and Mr. Colhoun says that he made the estimate for it under a misapprehension; but Mr. Hague wrote that he would tolerate no departure from it. Although there was a grumble about this by Mr. Colhoun, there was no serious objection made to the £1,835. Don't let it be supposed for a moment that the defendants deny there was extra work. They were not making that case. They agree that there was extra work done by Mr. Colhoun to the extent of £572 7s. 10d., which they admit and put into court. In respect to the money part, the defendants have brought into court a very substantial sum of money, and in their pleadings they say the whole of the work on which plaintiff was entitled to be paid according to the certificate of the architect amounted in all to £17,666 10s. 2d., and they lodged the balance of this sum in court, and they plead that that covered everything in the present action. His Lordship having dealt at length with the contracts and the evidence of the experts, as well as the correspondence between Mr. Hague and Mr. Colhoun, came to the question of delay. There were two questions with reference to delay: Had the plaintiff delayed? Had the defendants delayed; had they hindered and obstructed plaintiff in carrying out this work? In dealing with that the jury must start with this—that down to the year 1898 this church had taken six years to complete; but they must remember that two further orders were given, one in 1895 and the other in 1897, so that having regard to the time at which the defendants made up their minds that they would undertake these works and require Mr. Colhoun to go on with them a serious question would arise as to whether it could be said plaintiff took all the time defendants say he took. There was a terrific storm in December, 1894, and the effect of it upon the church was that a considerable loss resulted. The plaintiff asked for help in these circumstances and the committee refused, and very properly refused, because the contractor had to take the risk of storm. The strange thing about this matter was that both parties were clamouring about delay. Subsequently Mr. Shepherd, a landscape gardener, was sent down from Dublin to lay out the grounds around the church. It was perfectly clear that Mr. Colhoun did agree to supply stones from his quarries for the purpose of laying out the church grounds, and he (his Lordship) would certainly gather that it was only when Mr. Shepherd's son went to another quarry that Mr. Colhoun kicked up his heels and said he would not allow Mr. Shepherd near the church. Undoubtedly the gentlemen in Omagh wanted to get into the church; there could be no doubt about that, and the notice served was the best evidence of it. They did take possession because, according to them, there was no chance otherwise of getting into their church at all. Mr. Colhoun said that everything was completed with the exception of hinges, locks, and lead lights, and he also said that was altogether attributable to Mr. Hague. The service of the notices, which had not been acted upon, was very good evidence that the committee and Monsignor M'Namee did not want to press Mr. Colhoun. They gave him further time, and at last, according to their case, their patience being worn out and exhausted, they served notice, which they eventually acted upon, and got into possession of the church. He would leave it to the jury to say on which side the delay did occur. The defendants went into possession on the 19th of August. The plaintiff had stated that they took the plant which Mr. Ballintine had valued at £47 9s. 11d., and there was a claim to recover the value of that plant. The answer to this allegation on the part of defendants was that everything was taken into consideration by Mr. Hague. Was there a motive in trying to get Mr. Colhoun out? His Lordship supposed there was, but the jury had to say was it an improper motive. Did the defendants illegitimately and improperly serve that notice, and did they do it with a sinister object? Everyone of the members of that respectable committee, who had been examined, told the jury that they had absolutely no sinister object in getting possession of the church. In turning Colhoun out did they deprive him of moneys he might otherwise have got. Whatever the jury might think of it, there was no such motive underlying the action of Monsignor M'Namee or any single one of his committee, or of Mr. Hague. They never wanted to deprive him of a single penny that he could legitimately claim. They were liberal to him to a degree. In his own evidence Mr. Colhoun said he was always paid in a way beyond complaint, and in a way no other contractor in this country was ever paid. The whole of the contract was going on from '92 to '98, and it seemed to his Lordship difficult to say, with justice, that plaintiff could have completed the work in '96, because his claim for damages was based upon that alone. The jury had given the case an attentive hearing, they had now the whole facts before them, and it was for them to consider all the circumstances of it with fairness to all the parties concerned. He put the following questions to the jury:—(1) Is the sum of £2,366, lodged in court by defendants, sufficient to satisfy plaintiff's claim under the contract, and, if not, how much more remains due to the plaintiff for work done? (2) Were any extra works done without the authority, in writing, of the architect, Mr. Hague, and, if so, to what extent in amount or value? (3) Did the defendants fail to give the plaintiff proper instructions or directions for carrying out the work within a reasonable time? (4) Did the defendants obstruct, hinder, or unreasonably delay the plaintiff in the execution of the works, and, if so, assess the damages? (5) Was possession of the works wrongfully taken by the defendants? (6) Was the alleged delay on the part of the plaintiff in not completing the work occasioned by the default and delay of the defendants and Mr. Hague? (7) Were the defendants guilty of fraud in giving or procuring of the architect's notice of the 6th August, 1898? (8) Did plaintiff complete works included in the contract, before action was taken? (9) If not, was such non-completion caused by defendants wrongfully taking possession of the work? (10) What was the value of the plant taken by defendants? The result of the answers to these questions by the jury was, that the plaintiff had failed to establish any facts which deprived Mr. Hague, the architect, of his power to certify what sums were due to Mr. Colhoun under the contract, and for all other claims; his certificate was thus unimpeachable and binding on all parties, and Mr. Hague, having by his final certificate, found that the sum lodged by the defendants was all that Mr. Colhoun was entitled to on foot of all claims of whatever nature, and that sum being tendered by Monsignor M'Namee before the action, and lodged in Court by him, his Lordship gave judgment for Monsignor M'Namee and committee with cost of the entire action, which will be paid out of the sum lodged in Court by Monsignor M'Namee and his building committee.

Solicitors and Building Speculations —Davis and Sons, of West Bromwich, builders, sued Rowley, Chatwin, and Emerson, solicitors, to recover payment for work done and material supplied. The defence was that the materials were not supplied to the defendants, and the work was not ordered by them. Mr. Disturnal said that the defendants were financing a builder named Stamps in the erection of two shops and messuages at Spon-lane, the money being advanced to the builder on what was well known as a progressive mortgage. Defendants had to complain from time to time that the work was not proceeding satisfactorily, and became anxious to see the places let in order that their money might be secure. The architect (Mr. Bridge) wrote to them on October 28:—"I think as there is so little to do, unless Mr. Stamps can undertake to finish the work you should instruct me to have it completed." Defendants at once replied instructing Mr. Bridge to get the work finished, and he employed Messrs. Davis for that purpose, their bill coming to £102. Thomas Henry Bridge, of West Bromwich, architect, gave evidence in support of the claim, and said that when he presented the account defendants told him it was more than they expected—they thought it would have been about £50 or £60. They wanted him to take a second mortgage on the property in payment, and when he declined they said they were not liable, and did not intend to pay. They then suggested that he should get Messrs. Davis to take a second mortgage in payment of their account. They declined this offer. Defendants had taken possession of the property, and had let one of the shops. Plaintiff threatened proceedings, and in reply defendants wrote that they had no liability to Messrs. Davis, as they were acting only as solicitors to Mr. Stamps. They added that if an action were brought they would do their utmost to get Messrs. Davis condemned in costs. By Mr. Young: Over £300 had been spent on the property after he had mentioned £140 as the sum necessary to complete it. In a subsequent letter he asked for an advance of £20, saying that would be sufficient; but some of the work, in witness's opinion, was unsatisfactory, and he had it done over again. In writing to defendants to tell them he had arranged for the completion of the work he did not mention Messrs. Davis. In a subsequent letter he referred to "the contractors," and in another to "the builder." Defendants often visited the building, and he thought they knew that Messrs. Davis, and not Stamps, were completing the work. The first time he mentioned Messrs. Davis by name was when he sent the bill in. A member of Messrs. Davis's firm said that he took his instructions from Mr. Bridge, who showed him the defendants' letter. He understood that he was working for the defendants, but he never met them on the building. Mr. Young first submitted that the point at issue was a legal one—namely, as to the interpretation of the letter—and should be decided by the judge. Mr. Disturnal suggested that there had been ratification, and his lordship allowed the case to go to the jury provisionally. Mr. Young, reviewing the correspondence, claimed that it only amounted to an instruction to Mr. Bridge to see that Mr. Stamp's men finished the work. All Mr. Bridge was authorised to spend was "about £20." The jury found for the plaintiffs. Mr. Young then took his legal point, and the learned Commissioner, for reasons which he stated at length, gave the same verdict as that given by the jury.

Action Against a Sheffield Builder.—Foreman Juror Muddles the Verdict.—At the Sheffield County Court last week, before his Honour Judge Waddy, Q.C., and a jury, John

Embley, grindstone merchant, Pond-street, brought an action against Patrick Molloy, builder and contractor, Holliscroft, for £50 damages, caused by the collapse of a wall upon his premises. The plaintiff is a maker of grindstones and grindstone appliances, and for the past twenty years he has carried on business at his yard in Pond-street. Adjoining Mr. Embley's premises is Messrs. Rawson's brewery, and in May the defendant was building for the brewery a new bottling house there, on the side nearest the plaintiff's land. Between the plaintiff's land and the brewery was a boundary wall, twenty yards long, the lower part of stone and the upper part of brick. In order to get a good foundation for the new building Mr. Molloy dug for 3ft. below the stone part of the wall on Messrs. Rawson's side. The plaintiff's case was that Mr. Molloy neglected to prop up the wall and to make it secure, and the result was that on the 20th May the wall collapsed, and fell into Mr. Embley's yard. Close to the wall on the plaintiff's side were three buildings, a trap shed, an office, and a large wooden shed, and these were all greatly damaged. Mr. Embley's son, who was in one of the sheds at the time, was buried in the debris, and received injuries which had since prevented him from following his trade as a mason. The wooden sheds contained a number a grindstones, many of which were thrown by the collapse of the wall into Messrs. Rawson's premises, and were broken or otherwise spoilt for use. Tools and other articles stored in the buildings were lost or damaged. Mr. Molloy had built up the office again, but it was useless as a storing place. The plaintiff's evidence bore out this statement, and other corroborative evidence was given. Mr. Neal took the legal objection that there was no right of lateral support, the ground being made ground of less than twenty years' standing, and the building of less than five years' standing. His Honour, in summing up, asked where the damage was. If the jury could find it they might award it to the plaintiff. The foreman announced, after hesitating between defendant and plaintiff, that the verdict of the jury was for the defendant. Mr. Neal asked for judgment, and his Honour ordered it to be entered. The foreman then announced that he had made a mistake. The verdict was for the plaintiff for £12. Mr. Neal: Then I ask for judgment on the legal point. His Honour: I think you are entitled to it. Judgment was therefore entered for the defendant.

Builder and Architect.—Paul Rhodes, builder and contractor, of Leeds, sued the directors of the South Ward Liberal Club, Leeds, last week, at the West Riding Summer Assizes, before Justice Grantham, for the balance of an account alleged to be due in respect to a building contract. Mr. Tindal Atkinson, Q.C., in opening the case, stated that the defendants practically contended that the plaintiff was not entitled to recover, because he had not received a certificate from the architect, Mr. Windsor Thorp, who was the person appointed under the agreement to act between the contractor and the employers and certify as to whether the work had been done or not. Plaintiff's answer to this was that he was in a position to show that the architect had acted in such a way that it was unnecessary for him to possess a certificate. In 1895 his client tendered for the excavating, bricklaying, and masonry work in connection with a new club that was being erected by the defendants, and his tender was accepted, the contract being dated January 3, 1896. The chairman of the club, Mr. Gibson, was a joiner, and he entered into a contract with the club to do other work, while another director of the club, a slater, also entered into a contract. The work proceeded until May, 1896, when there was a strike, which continued until September, and, of course, threw the work back. The architect in the mean time was pressing plaintiff to go on with the work, and the building was ready for the roof on November 13. The slater and joiner were not ready to proceed with the work, however, and his client was again delayed. At the end of November the architect resigned, and from then until February, 1897, there was no architect acting under the contract at all, and one could imagine what a disorganised condition the work got into. Plaintiff applied for a certificate for the work that he had done, and was referred by Mr. Gibson, who was then in charge, to the architect, who said, however, that he could not give him a certificate, as he had resigned his position. On February 10, 1897, the architect resumed his duties, and a dispute arose between him and the plaintiff with reference to a concrete floor. Both parties got very warm, and plaintiff, losing his temper, called Mr. Thorp a liar. In consequence of this stormy interview the architect refused to meet plaintiff on any terms whatever, and the whole thing came to a deadlock. Mr. Atkinson proceeded to quote extracts from a number of letters that had passed between the plaintiff, defendants, and the architect. In one of these Mr. Thorp referred to some question in dispute, and stated that he did not like to be placed in a stupid and awkward position, and declined to have anything further to do with the matter or with the building. In another letter he said he did not feel inclined to issue any more certificates, and that until he was placed on a different footing he had practically resigned his position. Plaintiff stated that the original contract was £1,244, with £262 5s. extras, and the balance he now claimed was £417 19s. 1d. The architect was away from the work two and a half months. When he returned, Mr. Thorp asked plaintiff to lay some concrete for a wood-block flooring. Witness asked him to let it remain until the plasterers and joiners had finished, but Mr. Thorp insisted upon the work being done at once, and it had consequently to be done over again. Mr. Thorp afterwards told the directors that he never requested witness to do the work at the time that he did do it. "I was, naturally, riled," plaintiff went on, "and either he was a liar or I was, and I knew I was not." When he applied for payment of what was due to him, he was "driven from pillar to post." He applied to Mr. Gibson, who referred him to Mr. Thorp, who refused to give him a certificate, and to see or have anything to do with him. Witness had always been agreeable to the matter being submitted to an independent arbitrator. Cross-examined by Mr. Fox, witness stated that, like other people, he occasionally lost his temper, and he regretted that he spoke to Mr. Thorp as he had done; but if he had withdrawn the statement it would have been as good as admitting that he himself was a liar. Asked what he considered to be the reason why he was not paid, plaintiff said he had an idea that the club was short of money. His Lordship suggested that, having obtained this retractation, the defendants might agree on the appointment of an independent valuer, and settle the matter. Mr. Scott Fox remarked that his Lordship did not know the temper of the shareholders of the Liberal Club. They felt bound to stand upon their legitimate rights. His Lordship: But if the architect refuses to do his duty, they are not acting upon their legitimate rights. It is their duty to appoint someone else; or, in other words, the contract is broken. If the architect declined to act, the plaintiff must be released from liability. That is the question for the jury. The letters show clearly that Mr. Thorp was not willing to act. The jury intimated that they did not wish to near any more evidence for the plaintiff, and Mr. Fox then called the architect into the box. Mr. Thorp denied that he had ever resigned his position, and declared that he was always ready to act towards the plaintiff in accordance with his duties under the contract. After the writ was served upon him, witness made out a certificate which he thought correctly represented what ought to be paid to the plaintiff. Cross-examined by Mr. Atkinson, witness admitted that he threatened to resign on two occasions because the directors endeavoured to get him to do extra work without remuneration. When Mr. Rhodes called him a liar, he (plaintiff) was very angry, and lifted up his hand as if to strike witness. He considered the delay that had occurred at the works to be due to the plaintiff, and he had inflicted certain penalties in consequence. Mr. Scott Fox submitted that there was no case against defendants at all, and that they were not responsible for any error of judgment that Mr. Thorp might have been guilty of. The jury returned a verdict for the plaintiff, and his Lordship made an order for the amount payable to him, to be decided by an official referee.

The Builders' Strike at Hull.—Walters v. Green (Chancery Division, before Mr. Justice Sterling.)—Mr. Justice Sterling, in delivering his reserved judgment in this case on Wednesday, said it was a motion to restrain the defendants from interfering with those who worked or intended to work, save to obtain or communicate information. There had been a preliminary question raised at the hearing of the motion as to whether the action was properly constituted, and that had led to directions being given by the Court that a statement of claim should be delivered. That had been done, and he had a copy now before him. It stated very clearly the cause of action, and the relief the plaintiffs claimed. The plaintiffs were master builders carrying on business in Hull, and were members of the Hull Master Builders' Association. The defendants were officials of various trade-unions at Hull, and also of a federation, which was a union of all the trade-unions connected with Hull. It appeared that in the early part of the year there arose a labour dispute in Hull, and as the result a large number of men went out on strike, or were locked out. In order to fill the places of these workmen, the masters decided on importing workmen from Belfast, in Ireland, and these men entered into contracts with an agent that they would proceed to Hull and work as non-union men for a period of twelve months, and in some cases the masters they were to work for were to be specified by the Masters' Association. In considering the preliminary question, he had to refer to the statement of claim, as to which paragraphs 9 and 10 were important. Paragraph 9 alleged that the defendants, having ascertained what the masters were doing to fill the positions vacated by the men on strike or locked out, thereupon, with the intention of injuring the plaintiffs and other members of the Masters' Association in their trade and business, and thereby compelling the plaintiffs and other members of the Association to accept the terms of the union, and to conduct their respective businesses in accordance with the requirements of the union, wrongfully, and without lawful excuse, combined and conspired together to watch and beset, or cause to be watched and beset, railway stations and other places where workmen brought to Hull by the Masters' Association, or other non-union men employed, or about to be employed, by the plaintiffs, as some or one of them might happen to be, and the approaches thereto respectively, for the purpose of persuading or otherwise inducing such workmen not to work or to cease working for the plaintiffs, or any of them, or any other members of the Masters' Association. Then paragraph 10 alleged various overt acts for the purpose of persuading and inducing the new workmen not to work, or to cease from working for the plaintiffs, or other members of the Masters' Association. In view of that statement of claim, it appeared to him that the allegations amounted to this: that the defendants jointly committed a series of unlawful acts, causing damage to the plaintiffs. Therefore, what was alleged was a joint cause of action, that, in his judgment, the case was distinguishable from the case of Sadler, which, on this point, had been relied on. It was enough for him to state at the present moment that the action was brought in respect of joint acts. Then came the question whether the plaintiffs could properly combine within the meaning of the Act. That depended on the recent modification of the order. All these acts were done in pursuance of a combination, so as to make the defendants jointly responsible. He held that the action was properly constituted. There were two defendants who were very prominent—Tighe and Emerson—and the case against them was most strongly argued. Now, the defendant Tighe, it seemed to him, had been guilty of going beyond that which was allowed by the Act. He referred to one act, on the 31st May, when a number of men on strike were at the railway station, including the defendant Tighe, who spoke to the imported men and promised to find them work, &c., and said that it was not fair for Walters to import men. That evidence was not denied specifically, and it seemed to him that that was not attending merely to communicate information, but was attending for the purpose of inducing a man to abstain from working for the plaintiffs or any other members of the Masters' Association. He then passed on to Emerson, as to whom Johnson, in his affidavit, said that Tighe and Emerson were the first to speak to the imported men at the station, and Walters, who was one of the plaintiffs, said that on another occasion Emerson said to him, "We have got three men, and we intend to have the lot," to which Walters replied, "I do not think you will." Now, looking to the statement of Emerson himself, it seemed to him that he ought to come to the conclusion that he was doing more than communicating information. As to the other defendants, he came to the conclusion that the case against them had not been so established that he could pronounce against them at this stage of the case. In his judgment, therefore, the only defendants against whom the case was made out were Tighe and Emerson, and he proposed to grant an injunction against them, and each of them in a similar form to that he granted in the case of the joiners' strike at Halifax. He thought he was entitled to grant that injunction now, because, were this the trial and he found Tighe and Emerson were the only persons who combined together, he should be able to say that, according to the authorities, he might be entitled to give judgment against them.

◆

Last week the Cheshire Council decided to raise the wages of its roadmen 6d. per week, in order that all might belong to friendly societies. District surveyors were instructed not to employ men not belonging to a friendly society. The Parkside (Macclesfield) Asylum Committee were authorised to obtain plans and estimates for an extension of the asylum buildings, with a view to accommodate 250 additional patients.

Mr. Bicknell, Local Government Board inspector, held an inquiry at Scarborough Town Hall last Friday into a dispute between the corporation and Mr. John Malton, builder, of Scarborough, as to the cost of street improvements in Caledonia-street, where Mr. Malton owns property. Mr. Malton repudiated liability for the footpath, on the ground that he had already made it, and he also disputed the expenses for making the road, on the ground that they were excessive. Mr. Malton's apportionmen was £48 3s. 11d., of which he disputed £21 6s. For the corporation it was stated that the old footpath was defective, and it was necessary that it should be re-laid, but Mr. Malton contended that it was made under the supervision and passed by the corporation's building inspector. Mr. Bicknell said he would give his decision as soon as possible.

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ILLUSTRATIONS.

HOSPITAL OF SS. JOHN AND ELIZABETH, ST. JOHN'S WOOD, N.W.—ARCH IN ROYAL EXCHANGE SQUARE, GLASGOW.—THE SOUTH END ESTATE, DARLINGTON.—THE HOTEL MAJESTIC, HARROGATE.—THE CENTRAL BAKERY, ABERDEEN.—THE "GABLES," READING.—"SEA CROFT," MILFORD-ON-SEA, HANTS.

Our Illustrations.

HOSPITAL OF SS. JOHN AND ELIZABETH, ST. JOHN'S WOOD, N.W.

THIS hospital, which was originally in Great Ormond-street, adjoining the Hospital for Sick Children, its premises there having been sold to the latter hospital, is now being rebuilt on a site between Grove End-road and Cories-road. The chapel attached to this hospital in Great Ormond-street, which was erected some thirty-seven years ago at the expense of the late Sir George Bowyer from the designs of the late Mr. George Goldie, is now being re-erected at St. John's Wood, the façade being the actual one removed from Great Ormond-street. As much also of the interior of the original structure as could be removed will also be re-erected, while the general internal appearance of the original building will be adhered to as far as possible in every particular, including altars and all other fittings. This chapel, as seen on the accompanying view of the exterior and in plan, forms the central feature of the new building. Right and left are two blocks containing respectively, to the west on the ground floor, nearest to the chapel, two sacristies or vestries, beyond which are two isolation wards—i.e., temporary wards for cases to be removed, close by which an exit is provided. Above these are four private wards; while on the floor above are provided one private ward, an operating room, with additional top light, and a retiring room for the patient for the administration of anæsthetics. The corresponding block on the other side of the chapel comprises on the ground floor, pharmacy, board room, medical officer's room, a private entrance and with a way up to the latter's sitting room and bedroom above. The first and second floors are taken up by four private wards on each, with bath-rooms, &c. There are then thirteen private wards in all. Right and left of the chapel are public entrances into the hall, off which are two reception parlours. From this hall at the back of the chapel is the main staircase, in the well of which is a large hydraulic lift, and from which there is communication on the basement, ground floor, and second floor, with the adjoining nursing sisters' convent. The two wings parallel to the chapel to the east and west are similar in plan. On the ground, first, and second floors are wards for 17 beds, each 75ft. long by 25ft. 6in. wide, by 12ft. 6in. high. Attached to each are the usual small kitchen, bath-rooms, &c., and a staircase from basement to roof each furnished with a large lift. The building is built of picked stocks. All stonework is Portland. Window coins, heads, &c., are of Red Rubbers. Floor and stairs are fire-resisting, the former are laid with teak in narrow widths. Walls and ceilings are to be finished in Keen's cement. Sashes in mahogany. Heating and ventilation are to be treated as simply as possible. The former supplied by open fires and low-pressure controllable hot water, and the latter by controllable inlets and outlets: the extract for latter being worked in connection with the stack in the centres of wards. The roof, an asphalted flat with a parapet, and which can be reached both by stairs and lifts, will be used as a promenade hall by the patients and nurses. The architect is Mr. Goldie, of Kensington, and the contractor, Mr. C. J. Hinsley, of 10, George-street, Manchester-square, W.

FACADE OF THE ROYAL BANK OF SCOTLAND, GLASGOW.

OUR illustrations represent the principal of a set of six sheets of measured drawings of the façade of the Royal Bank of Scotland and adjoining arches, forming the west side of Royal Exchange-square, Glasgow. They were measured and drawn by Mr. James Mather, a student in Professor Gourlay's class of architecture in the Glasgow and West of Scotland Technical College. The front is based on the Erectheium, and the side arches have long been admired for their beautiful proportion and detail. The architect was the late Mr. Elliot, of Edinburgh. The drawings obtained a bronze medal in the National Competition at South Kensington in 1897.

SOUTH END ESTATE, DARLINGTON.

THIS terrace of houses, of which we give a view with plans, is about to be commenced, and the undertaking forms part of a scheme for the laying out and development of a considerable building estate by the Darlington South-end Estate Company, the owners. The architect, Mr. Robert E. Brinkworth, of Chippenham, was the author of the design chosen in the competition, which was instituted by the proprietors about two years ago. This terrace faces Coniscliffe-road, and the general façade assumes somewhat the form of a crescent, in the centre of which a semicircular gable makes a feature, and the bays are square to give distinction to the middle blocks. The arrangement of the interior may be seen from the two floors. The sanitary arrangements are situated at the rear. Stone and red brick are to be used for the walling, and slates for the roof coverings.

HOTEL MAJESTIC, HARROGATE.

THIS building is now being erected on a site in the centre of the town on the Ripon-road, adjoining and overlooking the grounds of the Spa Concert Room. The extent of the site is upwards of nine acres. There is an appreciable fall towards the south, and the main building, covering an area of over 30,000sq.ft., is set out on the rising ground nearly due north and south in the centre of the site, with the south front overlooking the Spa Gardens. A special feature of the plan is a large central lounge and entrance-hall over 100ft. in length, with doors to a wide, covered loggia in the centre of the south front, intended also for use as a lounge and to form main entrance from the terrace for the visitors in hotel. It is intended to keep this lounge and entrance separate and distinct from the bustle of arriving and departing guests, carriage traffic, &c., which will be served by an entrance vestibule and hall on the north side, with manager's and inquiry offices, cloak-rooms, passenger and luggage lifts, &c. A carriage drive from the Ripon-road will lead to this entrance on the north side. The large central lounge will be bridged over at a height of 10ft. by the main staircase, access being given at this height to gallery lounges on either side, thus forming an upper tier; the whole designed to be carried out in polished hardwood, the columns on ground floor being cased with panelling, and continued on gallery floor, with a free treatment of pilasters and arcading. The principal public rooms, of ample size and proportion for the accommodation of about 400 guests, are set out in a regular plan, east and west of the central lounge. On the west side are the reception-room, reading and dressing-rooms, smoking and billiard-rooms; and on the east side the whole of the ground-floor area is given for a large *salle-à-manger* and ballroom, with annexe arranged to communicate, so that the whole can be used *en suite* and form a splendid range of rooms for public functions, balls, receptions, &c., with separate carriage-drive, portico, and entrance, retiring-rooms, service-rooms, &c. The upper floors contain about 250 bedrooms, calculated to provide for 360 guests. On the south and west aspects the first and second floors are given up to private apartments arranged *en suite*, and, as far as possible, distinct and separate in service and accommodation. As the hotel is in the centre of a well-known health resort, and close to the medicinal springs, these self-contained suites have been made an important feature, and should be highly appreciated by delicate and invalid visitors. The construction throughout is of fireproof material, and provisions satisfactory to the municipal authorities have been made for emergency staircases from each of the upper floors. The elevations are designed for a free treatment of Early Renaissance, carried out in red Accrington bricks and Yorkshire stone dressing, the mullions, window-jambs, &c., to bay windows being of Pately Bridge stone. The central dome and cupola will be dressed with copper, and the roofs throughout will be of green Westmoreland slates. The covered loggia at entrance is carried on columns of polished Aberdeen granite. Plans are being prepared for a large range of stabling and loose-boxes for 50 horses, which will be built in a picturesque hollow on the east side, somewhat secluded from view of the hotel windows, while a large winter garden is planned leading from the hotel on the west side, with an entrance from the Ripon-road. The architect for the whole operation, including hotel, stabling, winter garden, engine-room, &c., is Mr. G. D. Martin, 3, Pall Mall East, S.W., and the whole work is being carried out by Mr. Thomas Holloway, of London, for the Frederick Hotels, Ltd.

CENTRAL BAKERY, ABERDEEN.

THE building occupies a site on the west side of George-street, and extends westwards to a narrow lane, which separates it from the grounds of Gordon's College. The front wall is built entirely of finely-dressed white Kemnay granite. The upper floors are arranged as residential chambers, whilst the ground floor is designed to fulfil the requirements of a first-class modern bakery, and will be occupied by Mr. A. B. Hutchison, Aberdeen. The premises will be lighted by electricity supplemented by gas. Messrs. Brown and Watt are the architects, and the estimated cost is £11,000.

THE "GABLES," READING.

THIS little house, built for the architect's own occupation, is situated on high ground on the outskirts of Reading, the fall of the site allowing for the terraced treatment, which is shown in our illustration. The work has been carried out by Messrs. Collier and Catley, builders, Reading, the architect being Mr. W. Ravenscroft, of the same town.

"SEACROFT," MILFORD-ON-SEA.

THE geometrical drawings from which our illustration is taken represent a little house now in course of erection at Milford-on-Sea, near Lymington, Hants. It is beautifully situated on the best part of the cliff of this quiet little watering-place, and in front overlooks the open sea, with Christchurch bay on the right, and "The Needles" on the left, whilst behind it to the northwards stretches the New Forest. It is being built for the architect, Mr. W. Ravenscroft, of Reading, by Messrs. Collier and Catley, of the same town.

CHIPS.

The Cottage Hospital, Dromore, Co. Down, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

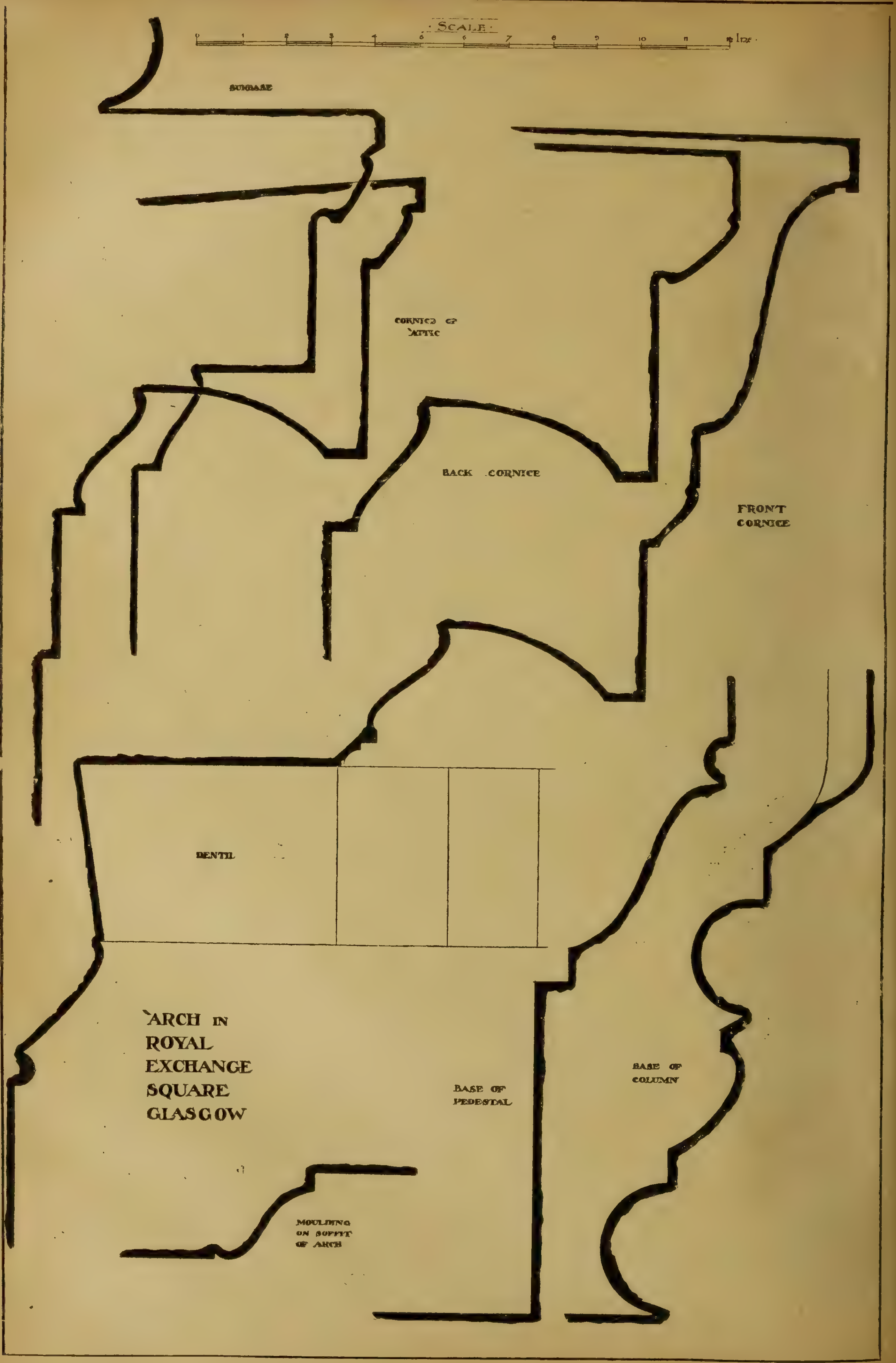
The parish church of St. Michael, Dawlish, was reopened last week after undergoing restoration at a cost of just over £3,000.

A memorial brass has been placed in the baptistery of St. Peter's Church, Budleigh Salterton, under the stained-glass window recently erected in memory of the Rev. George Woodhouse, who resided for 25 years at Salterton.

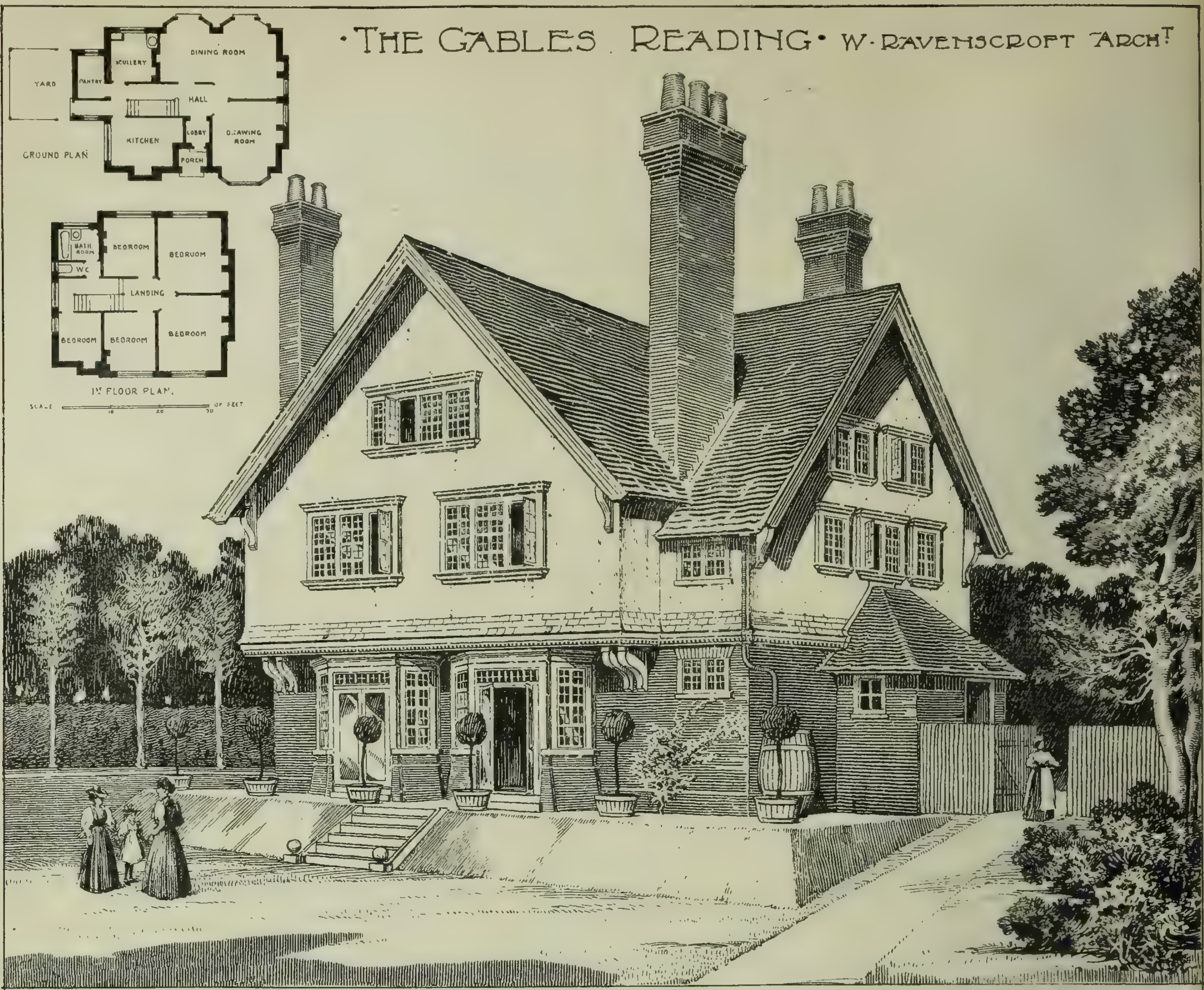
The Dartmouth School Board have decided to apply for permission to raise a loan to carry out drainage works.

At the last meeting of the Ludlow Town Council it was decided to seek the sanction of the Local Government Board to the latest scheme of sewerage and sewage disposal, minus the land filters, it being decided to increase the size of settling-tanks, with a view of saving nearly £800.

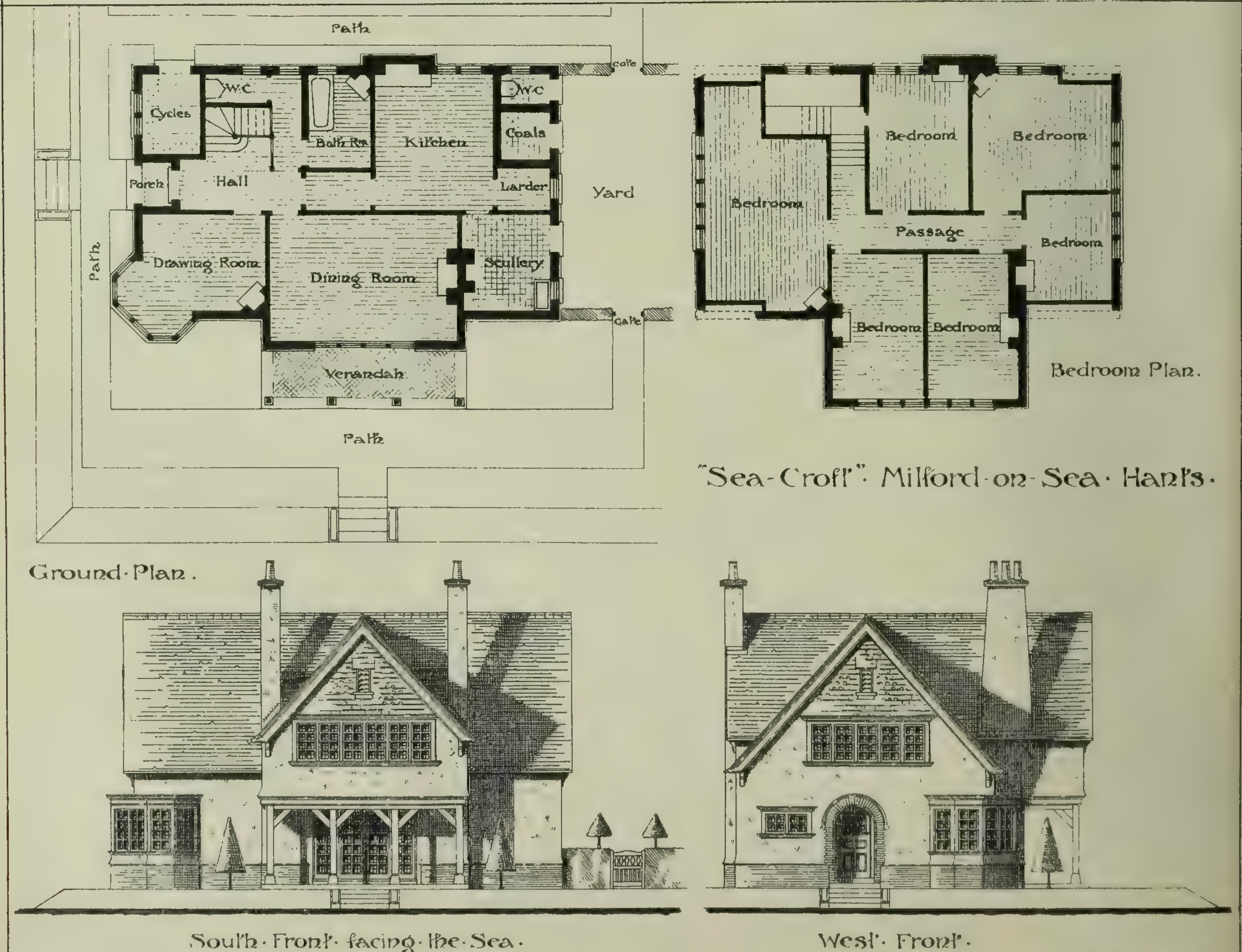
The parish church of Eastleigh, Hants, is to be enlarged at a cost of £6,540. Mr. W. Parmenter, of Braintree, is the builder. The work is to be completed by Feb. 20, 1901.



ARCH IN
ROYAL
EXCHANGE
SQUARE
GLASGOW



·THE GABLES READING· W·RAVENSCROFT ARCHT



"Sea-Croft": Milford-on-Sea· Hants·

Ground·Plan.

Bedroom Plan.

South·Front·facing·the·Sea·

West·Front·

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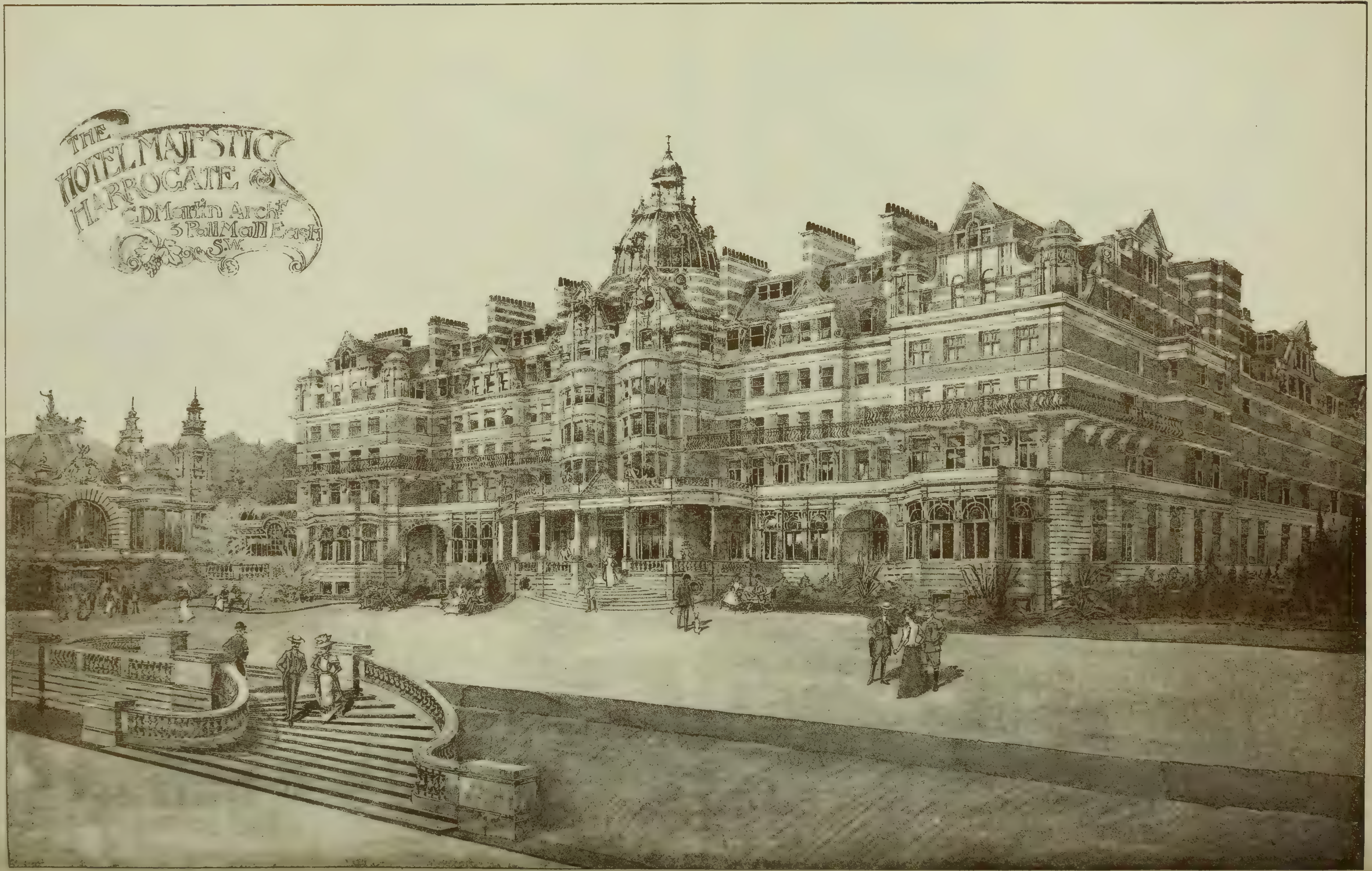
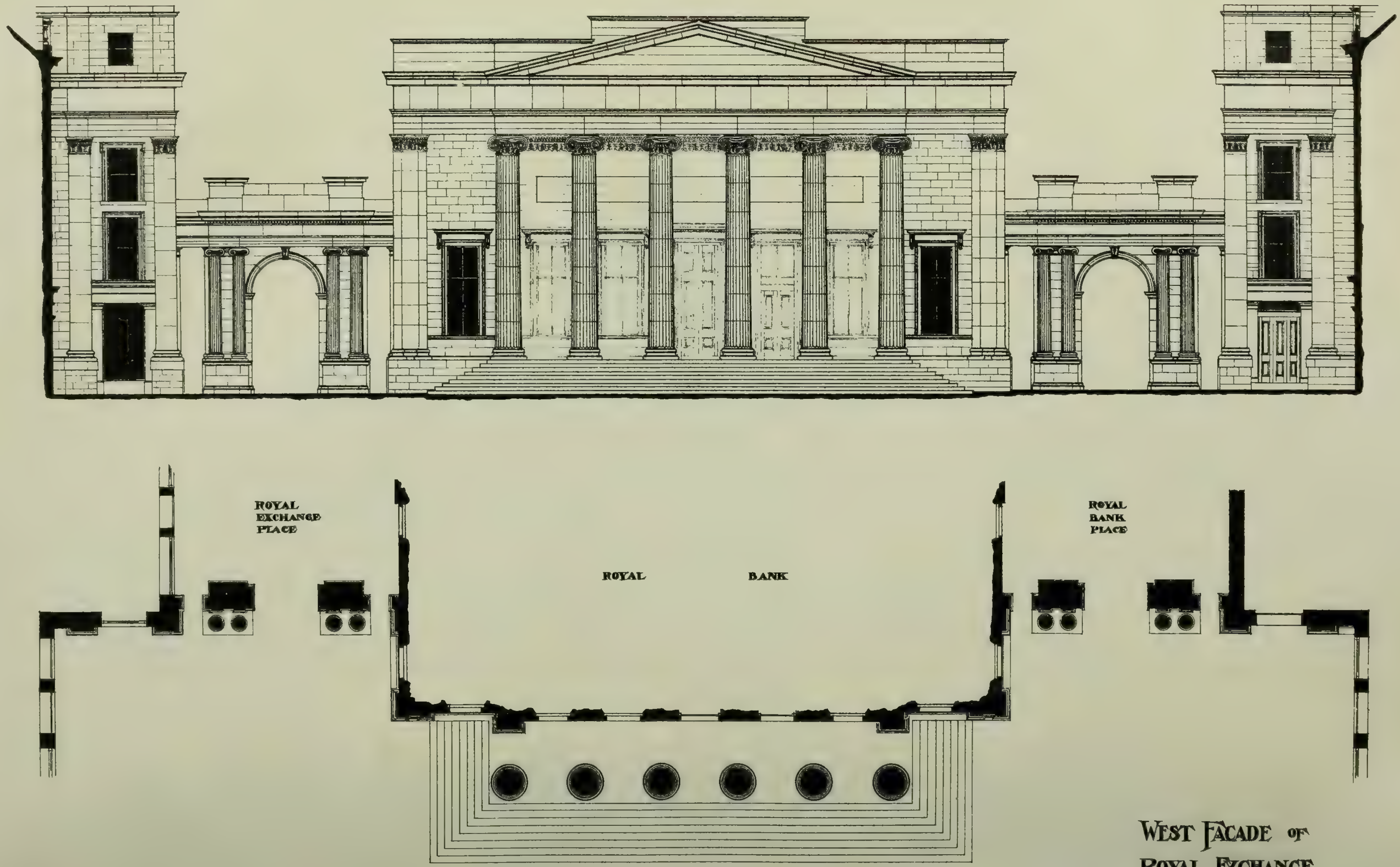


"PHOTO TINT" by James Akerman 6 Queen Square London W.C.

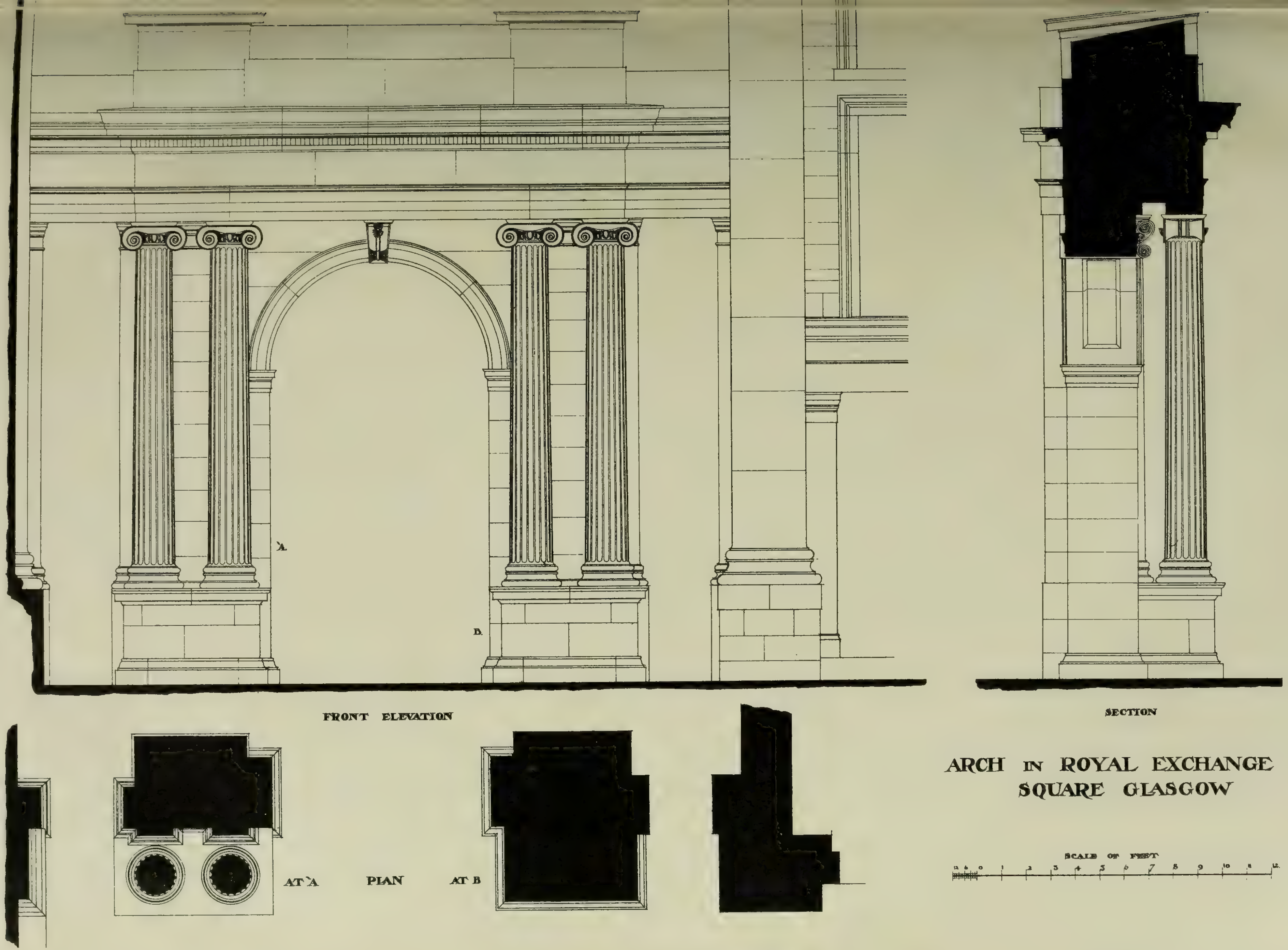


WEST FACADE OF
ROYAL EXCHANGE
SQUARE GLASGOW

NATIONAL BRONZE MEDAL DRAWINGS

BY JAMES MATHER

ARCH IN ROYAL EXCHANGE SQUARE GLASGOW

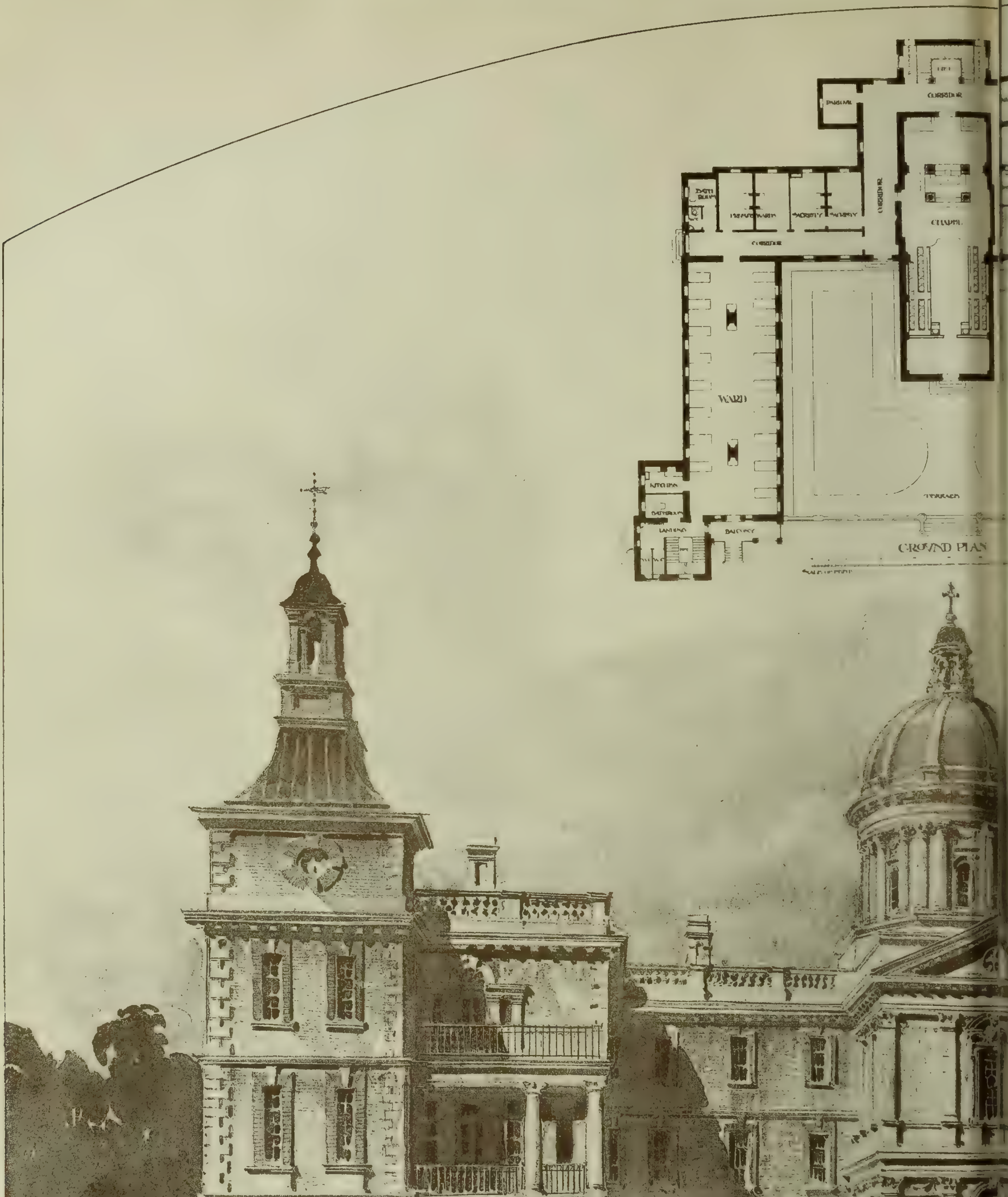


FRONT ELEVATION

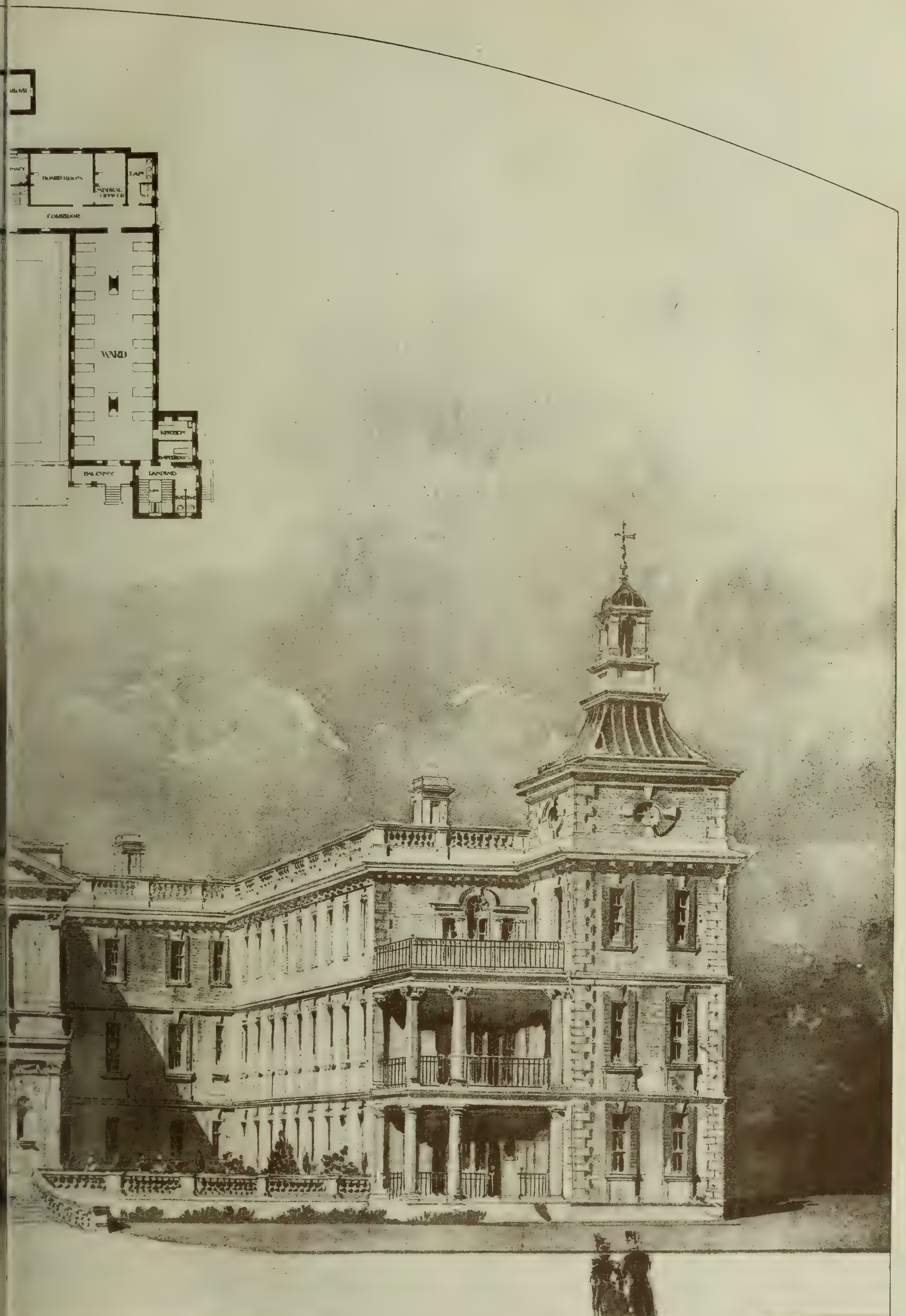
SECTION

AT A PLAN AT B

Photo-Lithographed & Printed by James Akerman 6 Queen Square, W.C



HOSPITAL OF S.S. JOHN AND ELIZ



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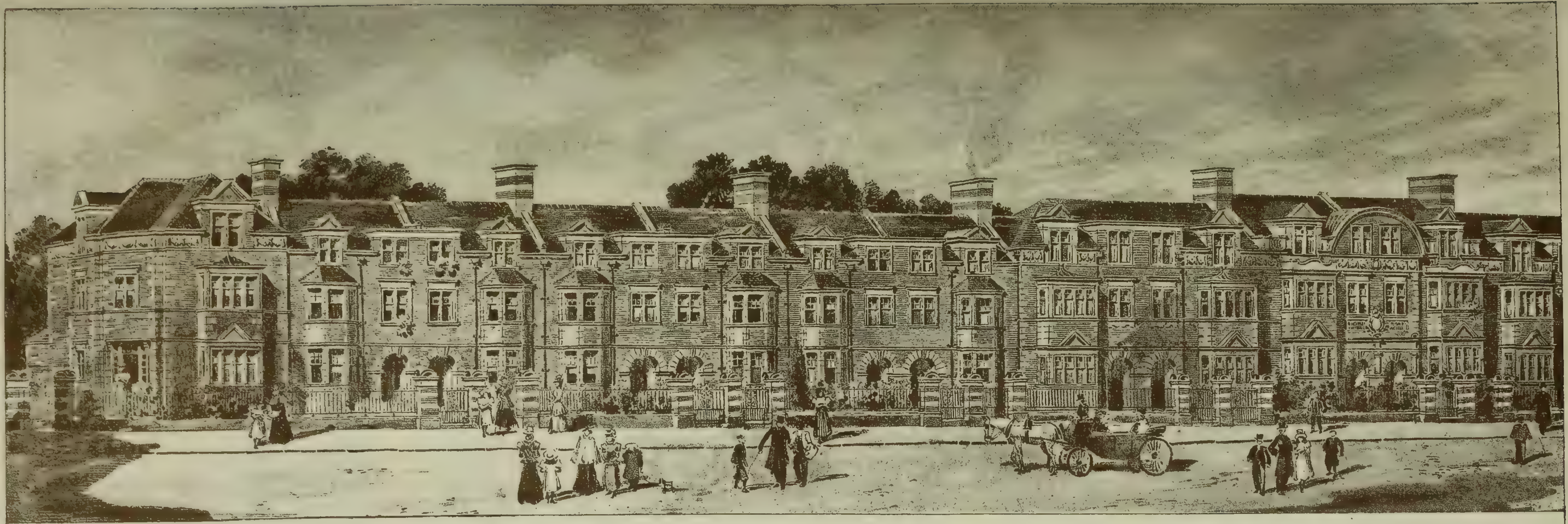
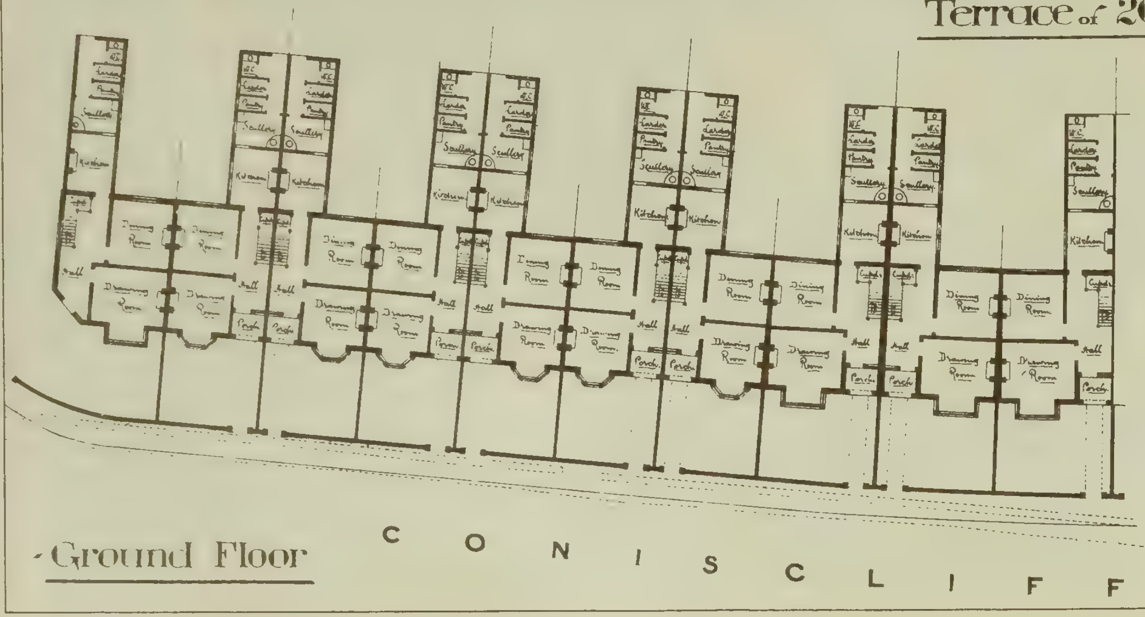
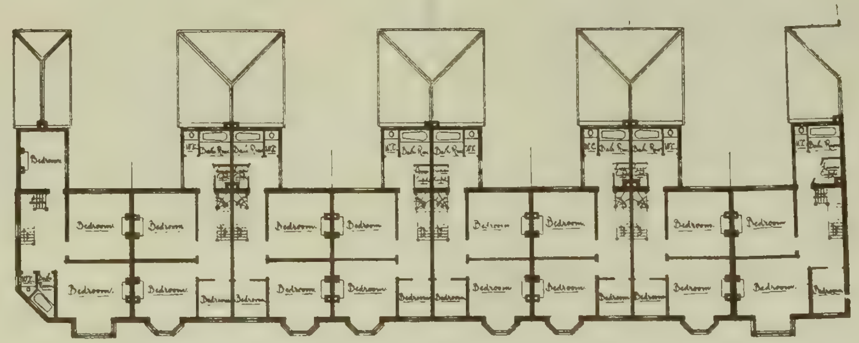
TH ST JOHNS WOOD NW E. GOLDIE ARCHT



Terrace of 20 Houses - · The Southend Estate, Darlington



· Ground Floor



· First Floor Plan

· ROBERT E. BRINKWORTH, F.S.I.,
ARCHITECT. ·

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.

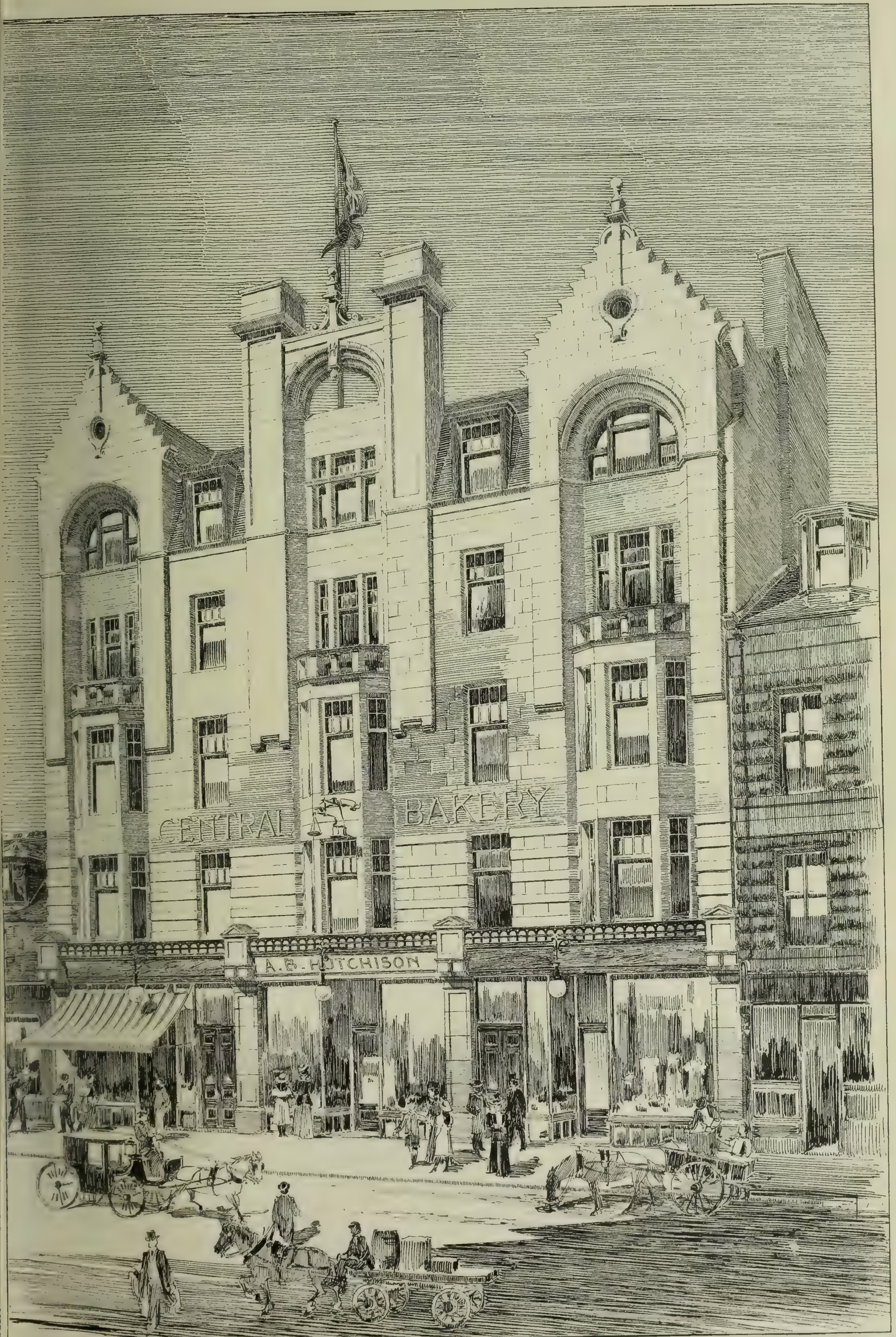
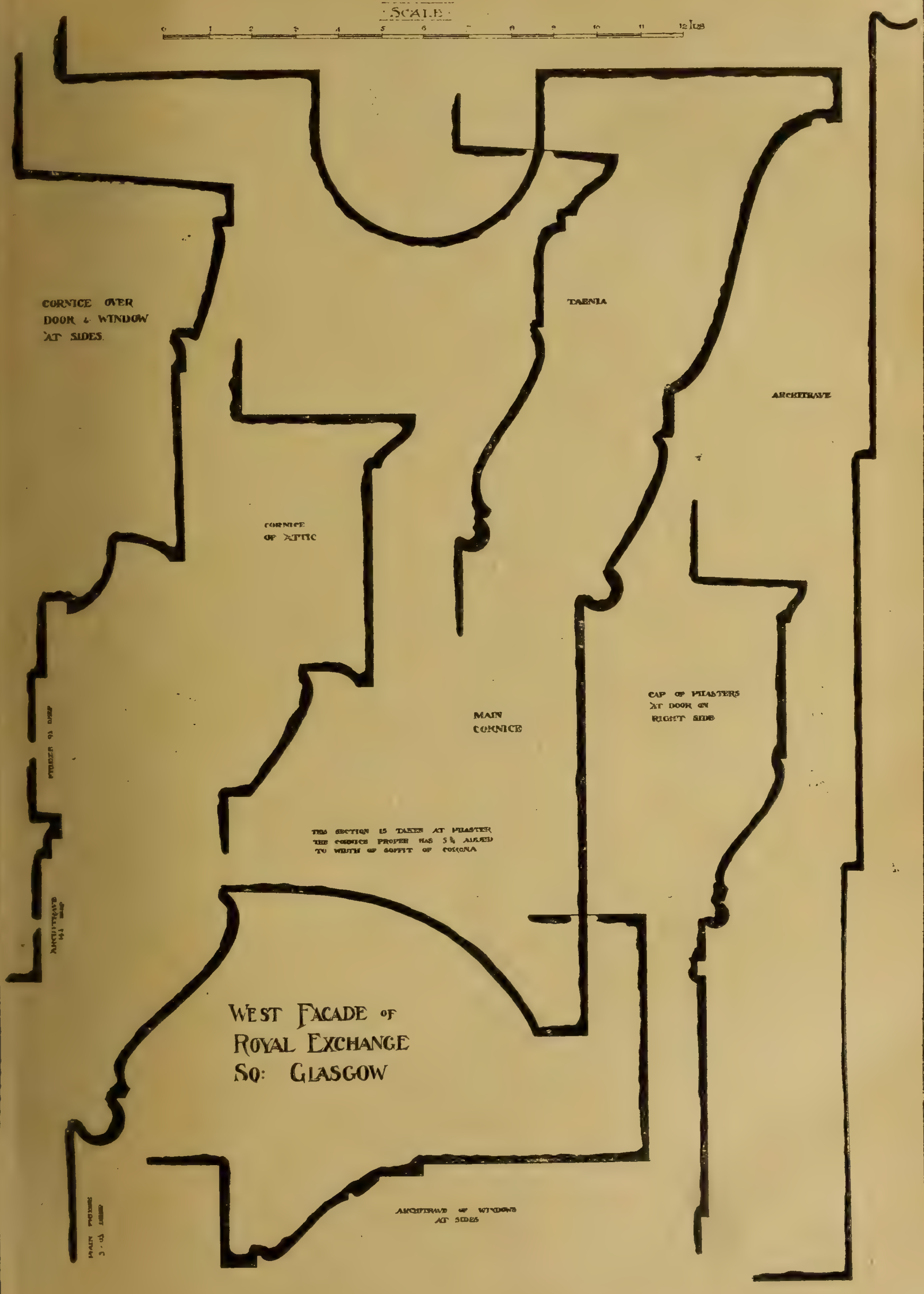


Photo-Lithographed & Printed by Jas. Akerman, 6 Queen Square W.C.

THE CENTRAL BAKERY ABERDEEN BROWN AND WATT ARCHTS


SCALE
0 1 2 3 4 5 6 7 8 9 10 11 12 Ins
CORNICE OVER DOOR & WINDOW AT SIDES
TAENIA
ARCHITRAVE
CORNICE OF ATTIC
MAIN CORNICE
CAP OF PILASTERS AT DOOR ON RIGHT SIDE
FRIEZE 9½ DEEP
THIS SECTION IS TAKEN AT PILASTER THE CORNICE PROPER HAS 5¾ ADDED TO WIDTH OF SOFFIT OF CORONA
ARCHITRAVE 14½ DEEP
WEST FACADE OF ROYAL EXCHANGE SQ: GLASGOW
MAIN PLINTHS 3·0 DEEP
ARCHITRAVE OF WINDOWS AT SIDES

BOOKS RECEIVED.

Proceedings of the South African Association of Engineers and Architects (Vol. IV. 1897-8), edited by G. S. Burt Andrews, Assoc.M.Inst.C.E., M.S.A. (Johannesburg Chamber of Mines Building).—The present volume before us contains several papers of interest to engineers and speculators, such as "Carburetted Water Gas," "Apparatus for Surveying Boreholes," "The Bladray Electric Drill," "Recent Boiler Trials," "Modern Brickmaking in the Transvaal: Handling and Disposing of Tailings, Sand, and Sluices in the Goldfields," &c.——*Murray's Handbook of Warwickshire* (London: John Murray, Albemarle-street), completes the useful series of English handbooks. Few counties are are so full of historic and architectural interest as Warwickshire. It is the home of the Shakespearian traditions, contains the great metropolis of the Midlands, and is especially rendered famous for the ruins of Kenilworth Castle, the Castle of Warwick, and a host of other buildings and halls of very picturesque character, like Baddesley, Clinton Hall, Aston Hall, Compton Wyngate, and Charlecote House. Of ecclesiastical buildings we need only refer to St. Michael's, Coventry, with its noble spire and nave, and Beauchamp Chapel, Warwick, though numerous other churches repay a visit. These are all to be found described under their respective heads, and the notes on the architectural features, by Mr. Jethro A. Cossins, are of value. Other authorities and writers whose labours have been acknowledged have contributed to the accuracy and reliability of this work. The maps and plans are accurate and well engraved, as usual in this series. Those who intend to make a tour of this county cannot do better than equip themselves with Murray's Handbook, in which they will find the best routes described and mapped out, and every place and building of importance accurately described.——The *Transactions for* 1898 *of the Society of Engineers* (London: E. and F. N. Spon) constitute a bulky cloth-bound volume of 240 pages. The principal contents are "Reservoir Embankments," giving useful suggestions for avoiding and remedying failures, by William Fox; "The Protection of Underground Water Supplies," by Dr. J. C. Thresh; and "The Bacterial Treatment of Sewage," by George Thudicum.——*The Column and The Arch*: Essays on Architectual History, with Illustrations, by William P. P. Longfellow (London: Sampson Low, Marston, and Co., Ltd., Fetter-lane).—This volume is a book of essays, many of which have appeared in the *American Architect* and the *Architectural Record*. The author attempts to trace the "main thread which binds together the successive phases of European architecture"; or, rather, he traces the evolution of the Classic Order from the Lotus column of the Egyptians, through the Classic Greek and Roman Orders, the Romanesque and the Renaissance styles. So also the arch has been a great element in style. This is a favourite and interesting pursuit of the architectual student. He soon begins to realise that all architectural forms have divided themselves into two great methods, the trabeated or beam system, and the arcuated or arch system; in other words, the architecture of the column and beam, and the arch. Greek, and all purely Classic architecture was, so to say, concentrated in the Order, or the column and entablature. The wall was subordinated, and the horizontal features accentuated. The author clearly describes these characteristics of Greek and Roman architecture, and he certainly exculpates the Romans from the charge of trying to claim a special style of their own. The Romans merely endeavoured, and succeeded, better than some critics have thought, in combining the column or beam system with the arch. The two things were to some extent contradictory, but on the whole it must be confessed the Romans made the best of the two elements. The author traces them through later periods, in some of which we find the honour divided between the column and the arch. At one time it is the colonnade, at another the arcade, that is made the feature, as in the works of the Early Christians and the old Basilicas. The Romanesque builder threw the Classic Order aside, and turned his sole attention to the arch, as we see in the basilicas of Rome or Ravenna, where the arcade was mainly used. One difference is to be noted: while the Classic Order could only be enlarged or diminished, as the building was made larger or smaller, thus destroying the scale, the Romanesque and later builders adopted units that could be multiplied in the large building. The elements were increased, as Mr. Longfellow says, not their scale, and the unit of size was generally the intercolumniation. The Later Renaissance shows how both the forms we have named were introduced into the same buildings; but we have no space to dilate. Mr. Longfellow's book or collection of essays is interesting. He shows without technical detail the influence of both these initial forms on the architecture of the leading great periods, and the photo. illustrations, though small, are well selected. —— *The Student's Practical Guide to Measuring and Valuing Artificers' Works*, by Edward Dobson, architect, with additions, &c., by E. Wyndham Tarn, M.A., architect. Seventh edition, revised. (London: Crosby Lockwood and Son.)—In this new edition of a well-established handbook several additions and revisions appear, reference also is made to the London Building Acts. The editor's additions comprise chapters on mensuration, construction as applied to the chief trades, the framing of floors and roofs, shoring, strength of timber, methods of working in stone, a description of building stones, smith's work, constructional ironwork, and various other branches, thus rendering this edition a textbook of general information to the student. The chapters on measuring and valution have been considerably extended, and the student who wishes to become master of quantity-taking and the processes of measuring, abstracting, and billing will find great assistance from this volume.——*Examinations in Sanitary Science* (London: St. Bride's Press) is the title of a sixpenny cloth-bound pamphlet containing suggestive answers to questions recently set at the examinations of the Sanitary Institute, the Surveyors' Institution, and the Association of Municipal and County Engineers. It is written by Mr. Ernest R. Matthews, engineer and surveyor to the Bridlington Urban District Council, who has himself passed the two former examinations, is concise and clear in style, and is illustrated by several rough diagrams and sketches. The only fault we have to find with this handy little work is the absence of an index. ——*The Essex Review* (Chelmsford: Edmund Durrant and Co). The new quarterly issue of this model county magazine contains a biography by Mr. E. A. Fitch, with frontispiece portrait of Mrs. Elizabeth Ogborne, the Essex historian, a natural daughter of Sir John Eliot, and also one of her mother, Mrs. Jane Jackson. Mrs. Coulson Kernahan pens an appreciation of "The Real Southend," illustrated with numerous photographs, and Mr. George Jackson gives some notes on "Essex in Literature," ranging from Gervase of Tilbury and Abbot Radulphus of Coggeshall to John Ray the botanist.——*Amateur Gardening for Town and Country*. Vol. XV. Illustrated with coloured plates and engravings. (Published at the offices of *Amateur Gardening*, 148 and 149, Aldersgate-street, E.C.)—This is a handsomely bound volume of this well-known journal from May, 1898, to April, 1899. Amateur gardeners in town and country will find every information they require about cultivation of flowers and vegetables. The occupier of a suburban villa, or the unambitious possessor of only a few windows, will find all he wants to know about suitable plants and flowers. Ferns, spring bedding plants, the greenhouse, flower and fruit gardens are all treated. The hints on planting will be found of much value. The coloured plates given every week add to the value and pictorial completeness of this encyclopædia of gardening. Many hundreds of replies are given weekly by practical gardeners, and a variety of subjects dealing with the proper time of pruning roses, stopping chrysanthemum buds, training fruit trees, laying-out gardens, &c., are discussed.

* * *

Alterations are being made to the Oundle Schools, from the designs of Mr. H. C. Boyes, architect, London, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

An appeal is now before the public on behalf of the old church of Ranworth, Norfolk. The great glory of the church is its roof-screen, perhaps the finest example left to us of the great school of decorative painting which flourished in the eastern counties during the fifteenth century. Of the sum of £4,350 which it is desired to raise, more than £3,000 is urgently needed to make the fabric of the church sound enough to protect the screen against the weather. The committee have placed the matter in the hands of Mr. Micklethwaite.

COMPETITIONS.

Aldershot.—The competition for the design of a new Masonic Hall at Aldershot has now been decided. Sixteen designs we sent in. The assessor was Mr. Edwin O. Sachs. Mr. Sachs accorded the first premium to the design entitled "Labour and Refreshment," recommending the author to be commissioned to erect the building with certain modifications, and the board of directors have approved of his report. Mr. Sachs further reported that no second premium could be awarded, as no one design showed sufficient superiority over the remaining to merit this distinction. On opening the sealed envelopes the author of the design was found to be Messrs. Clarence T. Coggin, A.R.I.B.A., and Thos. Wallis, of 15, York Buildings, Adelphi, London, E.C.

Harrogate.—The assessor in the Harrogate Kursaal Competition, Mr. Frank Matcham, architect, 9, Warwick-court, W.C., has given his award, which is as follows:—First premium (£150), Mr. R. J. Beale, Westminster Chambers, 9, Victoria-street, S.W.; second premium (£100), Messrs. Eade and Johns, Ipswich; third premium (£75), Messrs. Crosby and Power 9, St. Martin's-street, W.C.

Morecambe.—The following are the assessor's awards for the New Central Board Schools Competition:—The plans under motto "VII." were placed first, those under "M. L. P." second, and those under "Light" third. Eleven sets were sent in. Mr. Murray, architect to the London School Board, acted as the assessor. On opening the sealed envelopes it was found that the plans under the motto "VII." were those of Mr. John Newton, Grange-street, Bare, Morecambe; the second, "M. L. P.," those of Mr. Albert Gorton; and the third those of Messrs. Marshall Bros., Morecambe. At the special meeting it was resolved that the clerk write to Mr. Newton informing him that his plans had been accepted, and desire him to meet the board, with a view to the arrangement of terms for preparing the working designs, and submitting the same to the Education Department. The competition was limited to local architects.

PROFESSIONAL AND TRADE SOCIETIES.

Bristol Society of Architects.—On Tuesday, the 1st inst., a most enjoyable day was spent by the members of this society and friends, Bath being visited, and the remains of the Roman baths and the admirable new buildings recently erected by the city authorities under Mr. Brydon were inspected. Luncheon was served in the old council chamber at the Guildhall, Mr. Alderman Moore, Councillors Silcock, Cotterell, and Henshaw and the town clerk being present. After lunch coaches were requisitioned, and the party drove to the charming old manor-houses of South Wraxhall and Great Chalfield, with their wealth of Tudor and Jacobean work. A pleasant drive home through lovely country completed the day's programme.

* * *

The foundation-stones of a new Liberal club, to cost £2,500, were laid at Haslingden on Saturday.

A new fire-station was opened on Thursday week in High-street, Lewisham. The station, which has been erected by Messrs. Holloway Bros., Battersea, at a cost, including the site, of about £15,000, is equipped with one steamer, one horsed fire-escape. one hand-escape, and four horses, and a staff of 15 men, including 12 firemen, two coachmen, and the station officer.

A second meeting, for the purpose of forming a local branch of the British Association of Draughtsmen, was held at the Royal Exchange Hotel, Newcastle, last Friday. The chair was occupied by Mr. J. A. G. Ross, Durham. After 20 additional members had been enrolled, a provisional committee was elected to make the necessary arrangements for establishing the local branch. The district hon. secretary is Mr. F. W. Jennings, 30, First-avenue, Heaton, Newcastle.

Last Friday, following upon a resolution come to by the Perth, Eastern, Highland, and Central District Committees of the Perth County Council, to secure a site and erect a fever hospital at Burghmuir, near Perth, a meeting of representatives from these committees was held in the County Buildings, Perth. Arrangements were made for proceeding with the erection of the hospital without delay, the Local Government Board having approved of the plans. The contractors are Messrs. Spiers and Company, engineers, Glasgow, and the total cost is expected to be about £3,000.

Building Intelligence.

Bedminster.—On Saturday week the foundation-stone was laid of a new mission church in the Bedminster Down district. The church is designed in the Gothic style, red Winterbourne stone being used, with Bath stone dressings. It has an open-timber roof of pitch-pine, covered with interlocking tiles. The church is to have an aisle on the south side, divided from the nave by arches and columns of Bath stone; the aisle will be divided by sliding swivel partitions to form five classrooms for Sunday-school purposes, each classroom being 16ft. square, and having separate windows. The church has been planned to seat 700 worshippers, exclusive of the choir. The architects are Messrs. P. Munro and Son, of St. Stephen's-chambers, Bristol, and the contractor is Mr. E. Walters.

Gateshead.—The foundation stone of the new Drill Hall in Liddell-terrace, Gateshead, for the 2nd Battery of the 1st Newcastle Artillery was laid on Wednesday evening. The hall is 80ft. long by 47in. 6in. wide, with the main entrance from Liddell-terrace in the centre. At one end of the hall are officers' quarters, with private entrance from the front street, orderly office, clothing store, armoury, and harness-room with archway leading to the parade-ground. Above these, on the first floor, are the caretakers' quarters, ana gallery the full width of the hall. At the other end of the hall are the sergeants' mess, gunners' mess, lavatories, &c., and small yard. The building is of red brick, with stone dressings. The contractor is Mr. E. T. George, of Newcastle, and the architects are Messrs. Watson and Curry, 18, Grainger-street, Newcastle.

Ventnor.—The new block of the Hospital for Consumptives at Ventnor was opened on Wednesday by Princess Henry of Battenberg. The block has been erected at a cost of £10,800, and it will require another thousand pounds for furnishing. Unlike the other blocks, which are in pairs of cottages, this one contains three cottages. It has been built of local stone, with freestone dressings. Its design generally harmonises with the existing buildings. It provides accommodation for 21 patients, and for the requisite staff of nurses, with sitting and bedroom, kitchen, and offices arranged on the north of the block. Verandahs and balconies of cast iron and steel, with asphalte floors, are provided on each floor facing south. The architect is Mr. Theodore Saunders.

Walsall.—The report of a special committee of the town council—presided over by the Mayor (Alderman Clare)—who have had under their consideration the proposal to erect municipal buildings in Lichfield-street, on land which the corporation recently purchased, has been issued. The committee state that they have inspected the public buildings in various towns similar in size to Walsall, and recommend the erection of a town hall, comprising council chamber and three committee-rooms, municipal offices for all departments except the police (who, it is suggested, should retain their present quarters in proximity to the Guildhall, which it is proposed in future should be used exclusively for the administration of justice), and a public hall capable of seating 1,500 persons. The accommodation which it is recommended should be provided has, the committee state, become absolutely necessary, and it is pointed out that the present borougn offices were erected for the use of the staff of the Birmingham and Staffordshire Gas-light Company when the gas supplied by them to the town was only one-eighth of the quantity now manufactured by the town council. The total cost which the committee consider their scheme involves is £55,000, and they recommend that the sanction of the council be given to this expenditure, and that they be authorised to obtain competitive plans.

On Saturday afternoon, sixteen memorial-stones and a large number of bricks of the new Providence Church at Oldbury were laid by the scholars and teachers.

A new parish hall is to be built at Caterham, capable of providing sitting accommodation for three hundred persons, at a cost of £1,100. It has also been decided to add a new vestry to St. Mary's Church. Mr. Vaughan, builder and contractor, of Caterham Valley, is doing the work.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXV. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., and LXXV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. ***All Situation Advertisements must be prepaid.***

Received.—J. and Co.—H. U. D. C.—T. C. and Son.—L. and N.—Divider.—P. and L.—R. S. and Co.—W. T. T.—H. and Co.

F. G.—Go to Jeffrey and Co., 64, Essex-road. You cannot do better.

Floor.—J. and H. Patteson's (36, Oxford-street, Manchester) mosaic pavements can be laid from 7s. 6d. per square yard.

East Ender.—Call on Young and Marten, Caledonian Works, Stratford. You are sure to find what you want there.

Permanent.—The "Cunnah-Wright" partition is just what you seem to want. Write to 25, Billiter-buildings, E.C., for catalogue, &c.

Edw. T. P.—None to beat those made by Francis and Co., 64, Gray's Inn-road, W.C.

Dinner Lift.—You can get a very handy self-sustaining dinner-lift gear, for £5, from J. W. Brooke and Co, Lowestoft.

Country Mansion.—One of Blake's hydraulic rams will do all you want. Write John Blake, Oxford-street Works, Accrington.

A. J. W.—We do not think so. The firm you mention dropped out of our pages long ago, so they can hardly be doing much business!

Builder.—We do not think you can do better for veneers than at B. and J. Hudsons', Endell-street, W.C.

G. G.—Messenger and Co., of Loughborough, or Crompton and Fawkes, of Chelmsford. The people you name are of no use. For horticultural glass, Nicholls and Clarke, Shoreditch, are hard to beat.

Intercommunication.

QUESTIONS.

[12278.]—**Gesso Decoration.**—Is gesso decoration much used in modern work, and are there any good examples to be seen in London? Any information about the work will be thankfully received by—Learner.

[12279.]—**Architectural Rambles in Sussex or Hampshire.**—Will a reader who knows either of these districts give me any particulars of interesting old work to be seen, either domestic or ecclesiastical, and the most profitable towns to take? The guide-book information is too scant and stereotyped to be of much use, such a sentence as this occurs: "Church, a neat edifice, E.E., and Decorated; restored by Scott. There are a few interesting monuments or brasses, &c." One goes to see the said church, and finds it one in which everything ancient has been obliterated, or really a modern building of very poor design and detail.—Cycle.

[12280.]—**Electric Lighting Installation.**—Are there any easy guides by which the wiring of houses for electric lighting may be learned? Do architects specify for these fittings, or leave electric lighting to others?—Ajax.

[12281.]—**Plans for Local Authority.**—Can a local authority refuse to consider plans duly drawn or copied on drawing-paper, and demand them drawn on linen or tracing-cloth, their by-laws requiring only delivery of plans, without stipulating the material on which they demand them drawn, which is a private resolution on their minutes passed by themselves after their by-laws had been confirmed by the Local Government Board?—Rural.

[12282.]—**Fixing Ironwork to Stone.**—Can some one tell me the best way of fixing an iron railing to a stone coping, and what stone is the best?—In Doubt.

[12283.]—**Churches in Suffolk.**—There are several important churches in this county. I shall be glad to know of any special ones to visit near Eye or Stowmarket. The fine church of Southwold and its grand painted screens, Framlingham Church, Donnington Church are worth examination. Are there others of special interest, though on a smaller scale?—T. T. O.

[12284.]—**Fan for Ventilating Restaurant.**—Some restaurants in London are fitted with revolving fans in the upper part of room. Are these appliances of value in drawing out the vapour and effluvium, and can they be made noiseless? How can they be best worked? Is there any better plan of drawing off vitiated air? A reply will oblige yours—Interested.

[12285.]—**Keeping Rooms Cool.**—I should be glad if any of the readers of the Building News will give me any information as to the most efficacious plan of keeping top rooms and those in sunny aspects cool in summer. A variety of methods have been proposed—whitewashing the roof, putting a layer of felt under the slates, hollow walls, asbestos plastering, outside awning, but some of these methods are not easily applied. Ventilation appears to me to be a practicable method of keeping the air cool, if a supply of cold air can be allowed to enter the room, and the heated air carried off; but this would require a channel or duct for the cold air to be formed in the walls, or iron pipes laid from a cool area. Is there any method of doing this, and would such a plan be expensive? It has occurred to me a canvas or felt screen fixed a few inches from the outside of wall and up the roof, the space being well ventilated, would be the best plan. Any suggestion will be gladly received. Cool rooms in summer are absolutely necessary for health and comfort.—Try.

REPLIES.

[12275.]—**Scagliola Marble.**—Scagliola is applied to all forms of interior decoration, where marble would be used, such as columns, pilasters, wall-lining, dados, architraves, and pedestals for statuary, &c. It can be turned, moulded, or cast to any shape or design. When columns are required to carry any weight, arrangements are made for the insertion of iron cores or stanchions, and one of the two following methods adopted:—1. If the cores are only in a subordinate position, such as supporting galleries, &c., and do not directly form part of the main structure, the columns may then be turned and finished at the works, the core inserted on the building, and both raised together. 2. If the cores form part of main building, and must be erected as it progresses, the columns are then made entire, prepared ready for polishing, and forwarded. On arrival they are cut, and placed round iron or brick cores, cramped and made good without showing joint. This method of masking iron or brick cores is becoming very general. With ordinary care scagliola is indestructible; the polish is perfectly natural, being produced by friction and frequent stonings, as in marble, no varnish or substance of a like nature being used. When scagliola is prepared in a proper manner this polish will last for twenty to thirty years, without requiring renewal. The cost varies according to marble selected (the yellows—such as sienna and Giallo-Antico—being slightly cheaper), but is always reckoned at from $^1/_5$th to $^1/_3$rd the price of marble. I should add, these particulars of course refer to the excellent scagliola made by Bellman, Ivey, and Carter, of 157B, New Bond-street. As an architect, I do not recognise any scagliola but theirs.—Winton.

[12276.]—**Timber Measurement.**—I am obliged to "Regent's Park" for his reply to my query. Can he inform me the price of the book in question, as I should like to get it.—A. Z.

[12277.]—**Chimney.**—Monterey is a small town upon the Mexican National Railway, 168 miles from Mexico Junction on the road to Saltillo. Mexico itself—a city of about 332,000 inhabitants—publishes four daily newspapers, viz., *Le Trait d'Union*, *La Republica*, *Ferro Carril*, and *El Siglo*, besides half-a-dozen others issued weekly or at intervals. Any of these papers, or particular copies of them, can be procured by writing their respective publishers and stating requirements. If a copy of the *Mexico Monterey Daily Globe*, of March 14, containing report of a new chimney be desired, it can be had by return by merely writing to its publisher at Monterey, and enclosing half-a-dozen penny stamps to defray cost of same, postage, and search.—Harry Hems.

With respect to the post of diocesan surveyor for Bristol, we learn that the vacancy will not occur for a few days. When it does, Mr. C. E. Ponting will be re-elected for the entire diocese of Bristol.

The contract for municipal tramways in Sunderland on the electric overhead trolley system was given on Wednesday week at a price of £126,000, to Messrs. Dick Kerr and Company (New York and London).

WATER SUPPLY AND SANITARY MATTERS.

Bradford.—At a meeting of the Bradford Sewage Defecation Committee last week, the committee went into a comprehensive survey of the situation in which the city has been placed regarding the disposal of its sewage. A somewhat lengthy discussion took place over Mr. Watson's scheme for purifying the effluent, but no satisfactory decision was arrived at. The collapse of the Esholt scheme was also considered, and although the desirability of speedy action was recognised, it was generally conceded that the committee had a most difficult task before them. Various suggestions were made, with the object of meeting the new situation, but no proposal seemed perfect enough to satisfy the Local Government Board, and ultimately it was decided to send a deputation to London to ask that authority how the Corporation should now dispose of the city sewage.

Burton-on-Trent.—Last Friday Mr. H. P. Boulnois attended at the town-hall to hold an inquiry on behalf of the Local Government Board, relative to the application of the corporation to borrow £4,900—£2,900 for sewerage purposes, and £2,000 for supplying pure water to the houses and cottages on the sewage farm. Mr. T. H. Whitehead (town clerk) laid the case of the corporation before the inspector, and several other officials were present, including Mr. Lynam (borough surveyor). There was no opposition to the application.

Lincoln. — The corporation and waterworks committee of Lincoln have had the question of obtaining an increased supply of water under their consideration for some time past, and, observing the steps being taken by the Gainsborough Urban District Council to obtain a supply from the Keuper and Bunter beds of the Old Red Sandstone by means of deep borings, they have, after obtaining reports from Mr. De Rance and Professor Hull, the eminent geologists, decided to undertake a similar scheme to supplement the existing supply from the River Witham. The committee have decided to engage a consulting engineer to superintend the new works, and have selected Mr. Percy Griffith, A.M.I.C.E., F.G.S., of Westminster, he having special experience in this class of work in connection with the Gainsborough scheme, for which he has acted as consulting engineer since the death of his partner, the late Mr. Jabez Church, in 1896. The proposed boring will, it is expected, be from 1,500ft. to 2,000ft. deep, and as it will take some three years to carry out, it will be put in hand as early as possible.

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PARLIAMENTARY NOTES.

The New War Office.—The Earl of Wemyss, in moving last Friday that in the opinion of the House it was desirable that models of all public buildings of importance about to be erected at the public cost should be made and publicly exhibited, and that this was more especially to be desired at the present time, said the system he proposed was the almost universal custom in other countries, and had been successfully adopted in our own when Sir Henry Layard was First Commissioner of Works. The memorial he had had the honour of presenting to Lord Salisbury was one of the most weighty ever presented. It included the signatures of an archbishop, several bishops, six dukes, two field-marshals, and the names of peers on either side showed the interest taken in this national non-party question. A memorial such as this deserved consideration, and all that the memorialists asked was that for the sake of those who come after us all possible care and precaution should be taken to insure the erection of War Office buildings in all ways worthy of the site. On the strength of this memorial he rested his motion. The Marquis of Lansdowne said: A model on a table never by any chance presented the appearance of the actual building—you saw the model as you might see the building from the top of the Duke of York's column, a point of view from which the noble earl was very fond of regarding men and things in general, but humbler observers contemplated a building from the pavement as they walked to Westminster. A model would enable you to regulate the size and proportion of a building on Government ground, but there was no power to regulate buildings alongside on ground not the property of the Government. You might adjust the height of the new War Office buildings, but the huge building Whitehall Court behind might put out the whole scale of proportion. As regarded the War Office buildings, it was impossible to comply with the request for a model, but in regard to buildings to be erected hereafter, the Chief Commissioner of Works would consider the suggestion. A great part of the speech of the noble earl was an indictment of the manner in which plans were prepared, and their lordships who signed the memorial might not be fully aware of the steps taken by her Majesty's Government when the matter was decided. The Government decided not to adopt the procedure of inviting competitive designs. It was this system of competition that had led to the construction of several of those buildings of which the noble earl had spoken in terms of strong and not wholly unmerited condemnation. The general result of recourse to competitive designs was generally admitted to be unsatisfactory, and our best architects refused to take part in such competitions. Putting that procedure aside, the Government invited the Institute of British Architects to recommend the names of a certain number of architects who, in their opinion, were well qualified to undertake a building of this sort. A list of names was sent, and a Committee of the Cabinet considered these with designs of work done by the architects, and from the list selected two gentlemen, Mr. Young and Mr. Bryden, both architects with considerable reputation. With regard to Mr. Young, the committee were a good deal attracted towards him by the excellence of work carried out by him for the noble earl himself at his seat in Scotland. These two gentlemen sent in designs for the new public offices, and these were examined by a committee presided over by the president of the Institute of British Architects and professor of architecture to the Royal Academy. Then the designs were published in March in various illustrated papers, and on the whole the verdict of public opinion upon them was exceedingly favourable. The plans and specifications had all been prepared, and they were ready for the quantity surveyor, the ground had been broken in order to test it for the foundations, and to ask them now to hold their hands and to begin again seemed to be an altogether unreasonable proposal. The site, which was worth £20,000 a year, had lain idle quite long enough. The War Office at this moment was scattered about in no less than eleven different buildings: it was an intolerable state of things which interfered to an extent which he did not suppose anybody realised with the efficient conduct of business—(hear, hear)—and they protested against any further delay in supplying that office with a suitable home. How was the noble earl going to take a *plébiscite* on this matter of plans? To speak plainly, it was a case of *spretæ injuria formæ;* what was in the noble earl's mind was a preference for his own plan which he had fathered and put before the public. He admitted that in the noble earl's plan there was a very beautiful façade, but the building was entirely unsuited to a public office; it would completely dwarf the Horse Guards, it cut the site to waste in the most reckless manner, it would cost more money, and it would provide only 17,000ft. of flooring, instead of 29,000ft., as in the Government plan. The Earl of Wemyss was understood to say that the calculation by which that figure was obtained was absolutely worthless. The Marquis of Lansdowne said the fact was the noble earl began at the wrong end. Instead of saying, "I want a public office containing such and such accommodation, give me a beautiful building to put it into," he said, "Here is a beautiful building, shove your public office into it, it has got to get in there somehow." The noble earl was thinking entirely of the external appearance of these buildings; he himself thought also of the occupants. No amount of adaptation would ever make the plan of the noble earl fulfil the requirements on which they insisted. (Hear, hear.) The Government contended that their buildings would be a very useful and ornamental addition to the buildings which already surrounded Whitehall, and it was their fixed intention to go on with the construction of these buildings as rapidly as possible. (Hear, hear.) The noble earl, after giving them a few ideas on the subject of the construction of public offices, gave them hints on the subject of the construction of Cabinets. (Laughter.) He was afraid that his notions upon the one subject were almost as unpractical as were his theories in regard to the other; at any rate, whenever a new Prime Minister was called upon to bring together a Government he should be very much surprised if it was found that he was able to do so upon the lines which the noble earl had suggested for his guidance. Lord Stanmore said he must take it that another grand opportunity was about to be lost, as so many had been lost before, in the erection of our public buildings. They had an unequalled site and a magnificent plan by a dead architect. It was quite natural that living architects should prefer a plan by one of themselves; but the Government should have simply given instructions to adopt, as far as it could be adopted, the plan of Inigo Jones. How anyone having the power to do that, and having that site in hand, should have thought of erecting anything upon that site except the magnificent design planned by one of the greatest English artists for that very site he could not conceive. He had not a word to say against Mr. Young's plans. They were, he believed, effective; but to compare Mr. Young with Inigo Jones was to compare the infinitely small with the infinitely great. He rose to express his surprise at the utter incapacity of the Government to see what was really the question in this matter, and his belief that the country at large did desire to see buildings erected which should be worthy of the Empire. The Earl of Wemyss ventured to think that the action of the Government was nothing short of treason to posterity, a betrayal of a temporary trust and an audacious act on the part of chance, temporary, self-sufficient authorities. The Duke of Norfolk hoped the noble earl would not persist in his motion, but would be content with the expression of opinion it had elicited. The thing having, unfortunately, gone so far, no good purpose would be served by a factious opposition. Personal experience had taught him that models of intended buildings were of great use, and he hoped the Government would take into consideration whether, in future, when public buildings were to be erected, models could not be provided. The Marquis of Lothian hoped the Government would take into consideration what had fallen from the noble earl and the noble duke, and that in future models would be exhibited of all proposed public buildings. It was not fair that the taxpayers should be called upon to pay for buildings which might be very bad, and which they had no opportunity of seeing beforehand, whether they liked them or not. He expressed the hope that the banqueting-hall would be put to another purpose than that to which it was at present devoted and for which it was ill-suited. He suggested that the noble marquis should try to make some arrangement by which the hall should be used as a place in which public entertainments could be given by her Majesty's Ministers. The motion was withdrawn.

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STAINED GLASS.

Dunbar.—Last Sunday the Very Rev. Principal Story conducted the dedicatory service in the parish church of Dunbar of a six-light stained-glass window, given as a memorial of the late Duke and Duchess of Roxburghe. The window, being a transome, has two tiers of three lights each, and the artist has taken each triplet, and designed in the top one the Ascension, and in the lower the Nativity, with the kings and shepherds. They are depicted kneeling on either side of the centre light, in which is Joseph and the Virgin Mary, with the Babe in the manger. Mary is kneeling, gazing with maternal solicitude at the Child in the manger; Joseph is standing behind holding a lantern. Angels are bringing the wise men and the shepherds to the infant Jesus. Above is a choir of angels, holding scrolls and singing "Glory to God in the highest, on earth peace, good will towards men." This is written on the scrolls. The colouring of this subject is rich so far as the Holy Family and the kings and shepherds are concerned, but the whole of the angelic choir is depicted in silvery white glass, relieved with golden stain, and which forms a striking effect of colour. In the Ascension, our Lord is shown ascending to heaven. He is robed entirely in white, and is in the act of giving the Benediction to the Apostles, who are kneeling and standing grouped round, gazing upward to the departing Lord. Two angels in the side-lights are shown, with scrolls containing the inscription: "Ye men of Galilee, why stand ye gazing up to Heaven?" The colouring is principally of silvery white glass, in the upper portions of both subjects, but, with the colour in the draperies of the groups, is at the same time rich, harmonious, and subdued. In the tracery, which is again principally white in colour, relieved by ruby glass, is depicted the figures of Faith, holding the cross; Hope, with an anchor; and a seated figure of Charity, holding a flaming heart, and with a child kneeling at her side. In the smaller pieces occur the Alpha and Omega, and an ornamental treatment of the thistle; and there are other angels holding crowns. The window was designed and executed by Mr. Edward Frampton, London, the same artist who has designed all the glass at Aberlady for Earl Wemyss.

Haslemere.—The Bishop of Ripon on Tuesday evening unveiled a window which has been placed in Haslemere parish church as a memorial to the late Lord Tennyson. The subject of the window, which has been adapted from a design by the late Sir E. Burne-Jones, is "The Attainment," and represents Sir Galahad at the little chapel where the vision of the Holy Grail first comes to him. Behind him stands one of the Grail angels with a silver plate and a spear in his hands, and in the chapel is the Holy Grail on the altar with an angel kneeling behind it. Above is a crimson cloth, which is represented as having been removed from the Grail itself, and three drops of blood are dropping from it.

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The large contract for the granite required in the new docks and mole at Gibraltar, which, it is stated, will extend over six years, has been started by the suppliers of the stone, Messrs. Freeman and Co., Penryn, and the first consignment has been despatched.

The committee of the Bath Town Council met last week to consider the scheme for building workmen's dwellings in the Dolmeads. The committee gave the city surveyor authority to obtain provisional tenders for the execution of the work, so that everything should be in readiness for the carrying out of the scheme when the sanction of the Local Government Board to the loan is received.

Our Office Table.

The twenty-first annual Ecclesiastical, Educational, and Art Exhibition in connection with the Church Congress will be held at the Imperial Institute, October 7 to 14 next. Loans are solicited of ancient and modern goldsmiths' and silversmiths' work, ecclesiastical furniture, embroidery, paintings, drawings, carvings, photographs, books, manuscripts, and antiquities. A complete catalogue of the articles exhibited will be included in the "Illustrated Guide to the Congress and Exhibition," which will be published shortly before the Congress. A circular letter, signed by the President of the Society of Antiquaries and the Middlesex Archæological Society and others, inviting contributions to the exhibition, has been issued. The address of the secretary of the Ecclesiastical Art Exhibition is Maltravers House, Arundel-street, Strand.

The preliminary programme of the forthcoming Congress of the Sanitary Institute, which is to be held at Southampton from August 29 to September 2, has been issued. The inaugural address will be delivered in the Hartley Hall on the afternoon of August 29, and conferences and meetings of sections will take place throughout the week, whilst there will be a Health exhibition during the week at the Victoria Hall. There will be plenty of opportunities of social intercourse and enjoyment, and these include a public luncheon on the pier pavilion, a conversazione and reception by the mayor at the same place, a water party and trip round the island by the L. and S.W.R. Co., a driving excursion through the Forest, and other excursions and visits. It is expected that between 1,500 and 2,000 delegates will attend the congress, and, given a continuance of the present fine weather, it should be a successful as well as an enjoyable session.

The forty-sixth report of the Department of Science and Art, of the Committee of Council on Education, has just been issued. Dealing with the science division, it states that in 1898 there were 159 schools of science, with 21,193 students, which shows a considerable increase on the preceding year. The art division of the report shows that 12,041 elementary schools with 1,458,911 scholars were taught drawing and examined under the regulations of the department during the year. The total amount of grants for drawing which were paid to these schools during the year was £118,253, or a payment of 1s. 9d. per scholar in average attendance. The number of art schools and classes examined in art in 1898 was 1,893; and the number of students under instruction was 120,771. The number of visitors during the year at South Kensington was 977,305, and at Bethnal Green 392,283, making a total of 1,369,588, which shows a decrease of 13,829 as compared with the previous year. With regard to technical education, the report states that the total amount expended during the year by local authorities in England and Wales was £843,190 17s. 11d. in addition to £62,649, raised by loan, for the erection of technical and science and art schools. In Ireland the estimated total expenditure during the year on technical education was £5,637 18s. 3d. The expenditure of the Science and Art Department during the year amounted to £606,335, of which £58,891 were expenses of administration, and the remainder consisted of grants to colleges of science and art and museums.

The members of the Sanitary Inspectors' Association held their annual conference at Lincoln last week, and in connection with the visit a Health Exhibition, open from August 3rd to 19th, has been arranged. The conference opened yesterday week, when there was an official reception of the visitors by the mayor, sheriff, and corporation at the Guildhall. Following this, the president of the conference, Sir John Hutton, gave his address, and the election of members and associates occupied attention until luncheon time. The mayor and other members of the reception committee entertained the council to lunch at the Corn Exchange, and at three o'clock in the afternoon the Health Exhibition was formally opened. Subsequently the mayor gave a garden party in the Arboretum.

The Duke of Norfolk has authorised the placing of a tablet upon the new Post Office Savings Bank, which occupies the site of the Old Bull Inn, Carter-lane. This hostelry was only recently demolished. Exactly 301 years ago Richard Quiney, a gentleman with many debts, seated himself in the Bull and began writing to Shakespeare for a loan of £30. The world will never know whether Mr. Quiney obtained his request, but his need was pressing, and the letter bears every indication of an agitated mind. This is the only piece of Shakespeare's correspondence which has been preserved to us. No letters at all exist in Shakespeare's own hand. The tablet on the Savings Bank commemorates the indictment of Mr. Quiney's epistle. This is probably the first case on record in which a needy borrower has been thought worthy of such honour. The original letter is preserved at Stratford-on-Avon.

At last week's meeting of the St. Alban's School Board, the Rev. W. Carson, in moving: "That in any future building operations, the architects resident in the city be given the opportunity of submitting plans," said he was anxious that the public should not think the resolution in any sense hostile to Mr. Clarkson, because he had no idea of casting any reflection whatever upon that gentleman's work. His object was simply to plead for what he considered an act of justice on behalf of the architects in the city, who were ratepayers. The chairman said the building of schools was a highly technical matter, and required a considerable amount of experience. "They had in Mr. Clarkson an architect who had served them well for 18 years, and who has had a hand in building three important schools. For my own part, I shall be exceedingly sorry to turn my back on one who has so well and so long and so faithfully served us." The Rev. W. Carson: "We don't do that, sir." The chairman said he thought it was highly improbable that Mr. Clarkson would tender. He should move that Mr. Clarkson be the architect to prepare plans for the new school. The Rev. R. A. Squires seconded the amendment, which was carried, and the substantive motion that Mr. Clarkson be the architect was then carried, with two dissentients.—Mr. Carson and Mr. Avery.

The Knottingley District Council sat for three and a half hours on Thursday week discussing two letters from the engineer, Mr. Richardson, of Methley. In the first he said that if the council persisted in their resolution to give notice to the clerk of works, Mr. Barstow, he must ask them to engage another engineer. He added that he would not give his certificate for the payment of the retention money to the contractor till he had examined the work, and then it would be for only 10 per cent., as Mr. Binns had voluntarily offered to accept that in lieu of sureties. In the second letter (July 31) he referred to a statement made by a councillor as a "deliberate and wilful falsehood," and said he believed that gentleman was trying to secure the dismissal of Mr. Barstow because he had a personal grudge against him. With regard to Mr. Binns's threats to take proceedings against him and against the council, he reminded them that Mr. Binns could not enforce payment until his (the engineer's) certificate was presented. The council finally decided to pay Mr. Binns the retention money on receipt of the engineer's certificate, and to ask Mr. Richardson to expedite the matter so that the money might be paid. With regard to the notice to the clerk of works, it was resolved to reply to the engineer that when No. 2 contract was commenced his reappointment would be considered.

The discovery made a few days ago in the neighbourhood of Wincobank, Sheffield, is undoubtedly that of the remains of an encampment originally founded by the Britons and subsequently occupied by the Romans. The excavations, so far as they have proceeded, have established the fact that the camp, which consisted of an outer and inner line of defence, was surrounded by a formidable ditch. Along the centre of this ditch extended a rubble wall, sunk about 2ft., and with a height above ground of 5ft. A quantity of fragments of Roman pottery have, however, come to light, these being of a dark grey ware, and probably portions of cinerary urns. Perhaps the most interesting part of the discovery, as indicative of the manners and customs of the occupants, is the large quantities of slag that have been found. This has been located in such masses, and fused in such a manner, that it can only refer to the quaint methods of Romans for the purposes of warming themselves, and for cooking. In this connection, it is stated by a local antiquary, Mr. Charles Green, that when he visited the place as a student, some 35 years ago, he found a quantity of the slag (which was placed before the Philosophical Society), and also a number of fragments of the pottery. This last, however, he states, was not of the Roman period, but later, thus seeming to indicate that the camp was reoccupied in Saxon or Danish times. The excavation is in the hands of Mr. Howarth and other well-known antiquaries.

The decision in the competition for the best form of dust-cart arranged by the London County Council has been announced. The referee, Mr. Law, who undertook the task of adjudication, after the death of Sir Douglas Galton, has awarded the premium of £25 to Messrs. W. Glover and Sons, Limited, of Eagle Works, Warwick, for their van with four sliding covers, with longitudinal and transverse wind guards raised about 8in. above the covers. There were 325 competitors. The models and designs will be on view at the Parkes Museum, Margaret-street, Regent-street, W., from Aug. 15 to Sept. 9, between the hours of 10 a.m. and 6 p.m.

Some benevolent busybody is suggesting that the London water companies should appoint house-to-house inspectors to bring down the water consumption from 26 gallons per head per diem to 14 gallons "as at Halifax." This is a cool proposal! Londoners, who have to pay through the nose for what water they do get, are to be docked of half of what is a very inadequate supply by comparison with towns like Glasgow and Birmingham! It is quite bad enough as it is, that not one closet in 50 is properly flushed in London, now that the two-gallon flush water-waste preventers are compulsory. If the reign of the water monopolists last much longer, we suppose someone will prove that half a pint per head per diem is a plentiful allowance for the average Londoner!

The streets of Chicago are at present being cleaned by an elephant. The elephant in question is not a real one, but an animal made of steel, which is being tried with a view to seeing whether it is to be adopted as the regular street cleaner of the windy city. The work is done by means of the trunk, which is constructed of hundreds of steel bands linked together, giving it a perfect suppleness, while in the head is a powerful automatic bellows, and in the inside of the animal is the machinery by which it is propelled and by which it is worked. The engineer sits in a howdah, and whenever in his progress he sees a stone, a piece of paper, &c., he pulls one of the handles at his side, liberating the trunk, which, as it moves towards the object, sets the bellows acting. By means of suction the object is swept into the trunk, and then to the inside of the animal, where it is stored; another handle resets the apparatus, the trunk folding up, and when the inside is full another handle releases the whole of the lower part of the elephant, when all the *débris* falls to the ground. Two street blocks were cleaned in less than eighteen minutes, the work, we are assured, being done silently, and the movement of the animal is easy and graceful.

A report on the subject of the price of gas has been submitted to the City of London Corporation by its Streets Committee. The report refers particularly to the action of the Select Committee which was appointed by the House of Commons to inquire into the charges of the Metropolitan gas companies. The Corporation opposed the Gas Light and Coke Company's Bill with a view to inducing the company to reduce its charges for gas. The committee reduced the proposed increase of the company's capital from £3,500,000 to £2,500,000, and when the question came before a committee of the House of Lords the Corporation was again strongly represented by counsel in opposition, who urged that no further concessions to the company should be granted until its charges were reduced. The Bill was rejected, and the Streets Committee of the Corporation express their satisfaction at the fact that the City has been able once more to assist not only gas consumers within the City, but those living on the north side of the river, representing a population of 2,389,000 and a rateable value of £25,660,000. The committee, in their report, further remark that why gas on the north side of the river should cost 3s. per 1,000c.ft. and only 2s. 1d. per 1,000c.ft. on the south side is a mystery which has yet to be solved.

Mr. Ransome, in his new book "Japan in Transition" (Harper Brothers), quotes the following case as illustrating the risk incurred in accepting the local inspection clause in connection with Japanese contracts. Mr. Ransome says: "I cannot do better than refer to the large contract that was given out for cast-iron pipes for the Tokyo Waterworks. The contract in question amounted to about 16,000 tons of pipes and bends of all dimensions, from 4ft. in diameter downwards. The order was divided between two English firms and one Belgian. The Belgian house put in a very low figure, and received an order for 10,000 tons out of 16,000 tons. Of the 10,000 tons of Belgian pipes only 2,700 tons were accepted, and of the English 4,000 out of the 6,000. The greatest sufferer by the above transaction is the Belgian contractor, who took the risk of inspection in Japan on his own shoulders, and now finds himself saddled with three-fourths of his goods after delivering them half-way round the world. The risk of the British pipes was taken by two firms of merchants in Japan, who supplied the goods in question, one being an English and the other a Japanese house. There is no doubt that, with the exception of a small percentage, the rejected pipes, whether or not they filled the specification to the letter, were perfectly good for the purpose.

With the disappearance within the past few days of the old red-brick building in Aldersgate-street which had retained the historic name of Lauderdale House, passed away another of the old few relics of the domestic architecture of the City. It had long been used as a shop, and has now been demolished to make room for more modern and commodious, if not more æsthetically satisfying, business premises—although, for the matter of that, the house, so far as externals go, was a very ordinary three-storied, red-brick erection of Stuart date, such as may be seen in almost any London suburb. Was it Lauderdale House at all?—the house, that is, which was once the City residence of the powerful Duke who belonged to the "Cabal" Ministry? We doubt it.

The architects for most of the buildings of the Pan-American Exposition at Buffalo have been selected. Messrs. Shepley, Rutan, and Coolidge, of Boston, will design the liberal arts and agriculture buildings; Messrs. Green and Wicks, of Buffalo, will have the machinery and transportation building and the electrical building; Messrs. Howard, Cauldwell, and Morgan, of New York, have been given the electric-power building; Messrs. Babb, Cook, and Willard, of New York, have been assigned the stadium and administration building, north restaurant, station, and cloister; Messrs. Peabody and Stearns, of Boston, have been given the horticulture, forestry, and graphic art buildings; Messrs. Essenwein and Johnson, of Buffalo, will design the temple of music; Mr. George Cary, of Buffalo, has been awarded the mines and ethnology buildings and three entrances; Messrs. Carrere and Hastings, of New York, will have charge of the landscape plan, bridge, south approach, and all formal landscape work except the entrance court.

A new club is proposed for Londoners. It will be a floating one, and its anchorage will be somewhere off the Embankment. The advantages offered will be, in addition to the usual club accommodation, a swimming-bath and a promenade deck, whereon on sultry days in summer members can listen to sweet music and gaze into the swift-flowing muddy Thames. Happily, the river through London, dirty as it is, is odourless, so that members need not fear that their noses will be offended by anything worse than the evil smelling, but harmless, smoke of the penny steamers and tugs—a feature of the promised enjoyment, by the bye, which probably renders the swimming-bath a necessary part of the scheme. For years London had a floating swimming-bath on the Thames; but it failed to obtain public support, because of its high charges and the uncertain periods at which it was open. It remains to be seen if the proposed club will be better managed.

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THE ARCHITECTURAL ASSOCIATION.

The OFFICES of the Association will be CLOSED on SATURDAY, August 19th, and will REOPEN on MONDAY, September 4th, at 9.30 a.m.

AUGUST 26th.—SUMMER VISIT to MOOR PARK, Rickmansworth. Full particulars are contained in "Architectural Association Notes" for August.

G. B. CARVILL
R. S. BALFOUR } Hon. Secs.

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On Tuesday afternoon foundation-stones of a lecture hall in connection with the Derby-road Primitive Methodist Chapel, Southport, were laid. The estimated cost of the structure is £1,000.

Trade News.

WAGES MOVEMENTS.

Barnsley. — Negotiations have been pending during the last few days for a settlement of the masons' strike, which has existed at Barnsley since May 5 last, but the desired result was not attained. The men demanded an advance of ½d. per hour and alterations in the working rules, the chief of which related to the using of stone worked elsewhere, and the number of apprentices. Two representatives from the Executive Council of the men's association met the Masters' Association at a meeting held at the Royal Oak Hotel on Thursday night. The masters offered to concede the advance, providing modifications were made in the demand for alterations in the working rules. Both parties drew up rules, which were submitted to the men at their meeting, when they rejected the offer entirely.

Copenhagen.—At a general meeting on Tuesday of representatives of the trade-unions affected by the great lock-out in Denmark, it was decided to accept the draft of a general settlement arranged by the presidents of the Employers' Federation and the Joiners' Union, 128 votes being given in favour of its acceptance and 99 against it. The reservation was, however, made that the points in dispute in the joiners' trade should first be settled in detail, and that no workshop regulations should be introduced without a consultation between the men's and the employers' organisations.

Huddersfield.—On Saturday a meeting of the joiners of Huddersfield and district was held to receives a report as to a meeting of the representatives of the men and the employers on the previous Thursday, and to determine whether the terms of settlement provisionally agreed upon should be accepted. After discussing the matter for nearly two hours the terms were unanimously ratified. The men's demand for an advance of ¾d. per hour is acceded to, making their wages now 8½d. per hour. Work was resumed on Wednesday, and the men will withdraw the proposed new rule with regard to sending men out of town. The strike, which has lasted fourteen weeks, is now practically over.

Leeds.—There was another conference in Leeds on Monday between representatives of the Yorkshire Federation of Building Trade Employers and of the London Order of Bricklayers with the object of settling matters in dispute. A number of recommendations were agreed to for submission to the respective constituent bodies, and it is hoped they may lead to the termination of the lock-out.

Sunderland.—The builders' labourers in Sunderland, who are members of the National Amalgamated Union of Labourers, and who a few months ago had a dispute with the local employers on the question of wages, have had a mass meeting, at which they decided that, if the masters do not sign the working rules, agreed to in May, by Aug. 12, they will again cease work. The secretaries of both masters' and men's organisations are in communication on the subject.

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A new chemical department has recently been completed by the Public Works Department in the compound of the Calcutta Medical College, from plans by Mr. W. Banks Gwyther, F.R.I.B.A., of Calcutta.

A successful effort is being made in aid of the projected restoration of Stody Church. Mr. Green, the architect, has made a thorough survey of the building, which is cruciform in shape, and consists of nave, north and south transepts, and chancel, with round embattled tower, and he estimates the cost of restoration at £1,791. The greater part of that sum will be devoted to the roof.

The Chancellor of the Diocese of London has sanctioned the proposal to lay out the north-west portion of Hammersmith Churchyard as a playground for the scholars attending the church schools.

The first examination for certificates of qualification for appointment of sanitary inspector, under section 108 (2) (*d*) of the Public Health (London) Act, 1891, will be held in London on Tuesday, Dec. 5, 1899, and the four following days. Particulars will be forwarded on application to the hon. secretary, Mr. Wm. R. E. Coles, 1, Adelaide-buildings, London Bridge.

The public ceremony of formally declaring open the extensive improvements and enlargement of the square at Bournemouth, was carried out by the Mayor (Mr. W. Hoare) on Saturday. The improved dimensions of the square and bridge are 240ft. each way, representing altogether 1⅓ acre. An ornamental grass plot has been laid out in the centre, with an electric-light column in the middle 65ft. high, and three electric arc lamps 2,600 candle-power each are attached. There are also four smaller ones at different corners.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 0 0	,,	9 0 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£7 0 0	to	£8 0 0
Cast-Iron Stanchions	7 0 0	,,	8 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	11 10 0	,,	12 10 0
Cast-Iron Sash Weights	4 12 6	,,	4 15 6
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 12 6	to	£6 17 6
4in. to 6in.	6 12 6	,,	6 17 6
7in. to 24in. (all sizes)	6 12 6	,,	6 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 2 6	,,	17 2 6
Pig Lead, in 1cwt. pigs	15 7 6	,,	16 7 6
Lead Shot, in 28lb. bags	19 0 0	,,	20 0 0
Copper Sheets, sheathing and rods	83 0 0	,,	84 0 0
Copper, British Cake and Ingot	79 15 0	,,	80 10 0
Tin, Straits	125 0 0	,,	126 0 0
Do., English Ingots	127 10 0	,,	128 10 0
Spelter, Silesian	27 0 0	,,	28 0 0

TIMBER.

Teak, Burmah	per load	£11 5 0	to	£16 5 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	4 7 6	,,	6 10 0
,, Oak	,, ...	4 10 0	,,	6 5 0
,, Birch	,, ...	2 5 0	,,	3 0 0
,, Elm	,, ...	3 17 6	,,	4 17 6
,, Ash	,, ...	3 2 6	,,	4 7 6
Dantsic and Memel Oak	,, ...	3 5 0	,,	4 0 0
Fir	,, ...	1 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	3 15 0	,,	6 5 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5	,,	0 0 7½
,, Honduras	,, ...	0 0 4⅞	,,	0 0 4⅞
,, Mexican	,, ...	0 0 3¾	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 4⅝
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3¾
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 3	,,	0 0 7½

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£19 0 0	to	£25 10 0
,, 2nd	14 0 0	,,	17 5 0
,, 3rd	6 5 0	,,	10 5 0
Canada Spruce, 1st	8 5 0	,,	10 5 0
,, 2nd and 3rd	7 0 0	,,	8 5 0
New Brunswick	7 0 0	,,	7 15 0
Riga	8 10 0	,,	9 10 0
St. Petersburg	10 0 0	,,	16 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 15 0	,,	10 10 0
White Sea	11 15 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 11 6	,,	£0 14 9
2nd ditto	0 10 0	,,	0 11 9
Other qualities	0 5 3	,,	0 6 6
Staves, per standard M:—			
Quebec pipe	—		—
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£20 2 6	to	£20 12 6
Rapeseed, English pale	,, ...	23 5 0	,,	23 5 0
Do., brown	,, ...	22 0 0	,,	22 0 0
Cottonseed, refined	,, ...	19 0 0	,,	20 0 0
Olive, Spanish	,, ...	30 0 0	,,	32 0 0
Seal, pale	,, ...	18 10 0	,,	18 10 0
Cocoanut, Cochin	,, ...	28 10 0	,,	29 0 0
Do., Ceylon	,, ...	25 0 0	,,	25 0 0
Palm, Lagos	,, ...	24 10 0	,,	24 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 18 0	,,	1 0 0
Turpentine, American	per tun	28 15 0	,,	29 0 0

THE BUILDING NEWS
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HYGIENE IN CONSTRUCTION.

THE hygienic ideal of building is of comparatively modern date. We may indeed say that previous to the Public Health Acts coming into operation, any notion of what a healthful dwelling was did not exist except in theory. Architecture as practised was not an art to incorporate any sanitary exigencies. These were thought to be quite outside the domain of architecture, or rather to be subordinate to the work of the architect, and to be unworthy of his attention. To him it was far more important that he observed the rules of Vitruvius and Palladio in his proportions of windows, than that he should consider the height of his rooms for ventilating purposes, or the position and quantity of the light to be admitted. Any openings in walls or ceilings, or trunks in roofs, would have been deemed unworthy of the architect's attention. The designers of houses in the forties had no other idea of warming a large room than by putting an ordinary fireplace at the end or side of it, with the old-fashioned hob-grate recessed so far back that the effects of radiation of heat were reduced to a minimum—in fact, only about one-third of the room could be warmed by direct radiation. We know the state of house drainage and ventilation at the period we refer to—the most erroneous and dangerous conceptions of drainage, ventilation, and plumbing fixtures existed.

All this has now changed; the architect has to acquire, in addition to his own art, a new science—that of sanitation as applied to building; to learn Acts of Parliament which apply especially to drainage and ventilation, without which he cannot plan any residence, however small. He has now to master those sections of the Public Health Act, 1875, which apply to the structure of walls and foundations, roofs and chimneys, to the sufficiency of space round buildings to secure a free circulation of air and ventilation, and with respect to drainage and closets. For this purpose he has to deposit plans of buildings with the local authorities. His work is not really at an end when he sees to drains and external sanitary matters. By the Public Health Amendment Act 1890, which is an extension of the powers of section 157 of the old Act, the local authorities can make bylaws to control the flushing of inside closets, and the height of rooms used for habitation, &c. There is a great deal of unnecessary overlapping and interference with regard to these matters in operation; still, the modern house is an embodiment of the sanitary knowledge and experience that have been gained during the past sixty years, and may be regarded as a gauge of the progress we have made in sanitary progress during that period. We have every reason to be satisfied with the results. Looking at the details of plumbing fixtures, of sanitary appliances and fittings alone, we may see what a revolution it has effected. We have only to take up any ordinary manufacturer's illustrated catalogue of these fixtures to notice the improvements in drains, siphons, and traps, and the introduction of salt-glazed ware or brown ware for brick and lead. The "wash-down" and other forms of improved earthenware closets that have taken the place of the old insanitary metal "pan" contrivance; the entire abolition of the D trap, with its lurking danger, and of the hermetically-sealed system of internal and external piping, have wonderfully helped to produce a healthy house. But there is a great deal yet unachieved. We have now learned how to cut off sewer gas from our houses, instead of as before, laying it on. We have learned something of ventilation: how to extract the vitiated air from our rooms; but we have yet to discover a method of rendering our houses cool in summer and comfortably warm in winter, and until we are enabled to keep our rooms cool in hot weather, with a temperature outside varying from 75° to 90°, we can hardly be said to have solved the problem.

The extremes of heat and cold which are common to our climate have to be brought under some control or rule of moderation before we can claim to be able to construct a hygienic house. Unless we have some means of regulating temperature, a large percentage of the inhabitants of our towns must continue to suffer, and a healthy condition of existence is out of the question. The extreme heat that we have endured for some time past has brought with it many evil consequences which we have to face. Confining our attention to matters of domestic convenience alone, it has been found very difficult to keep our larders and pantries cool enough to insure that our food supplies shall be maintained sweet and wholesome. Many people have complained, even those with good store rooms, of the impossibility of keeping food in a fit state for consumption many hours with a temperature outside of somewhere between 85° and 90°. Such things as meat, milk, and butter cannot be kept wholesome. We are compelled to ask whether architects in the planning of houses, are always so careful as they should be in the location of these offices? Are they always placed on the coolest sides? In a very large number of instances in London alone we have seen the larder on the west side, one of the sunniest aspects. Worse than this, it is sometimes found on the south side. These instances refer to houses built in streets. Whatever the position given to the front windows of living rooms, it is absolutely necessary to place larders on the coolest side, the north, north-east, or east, and this can be done in all cases when the house fronts south, and to a less extent when it faces north or east. Even when the main front is north or east, the larder can be placed at the extreme back of the building with a window to the east, at the end of the projecting offices, now usual in street buildings, and also at the end of the office range in houses with an eastern aspect in front; in this case the larder windows should be made to face northwards. Of course in the country or suburban villa there is less excuse for placing larders on the wrong side. They should also be removed from all w.c.'s or bad air from gullies, and the proximity of a fireplace should be avoided.

We again assert it is more essential to preserve our food in a fit state during hot weather than to sacrifice it to the position of our living-room windows, as in these rooms we can adopt other measures for moderating the heat. We cannot all yet fit up refrigerators to our houses, though the time will come when every decent house will be provided with its own cool store.

We next inquire how we can render our living and sleeping rooms cool, and regulate their temperature. All sorts of excellent materials for walls and floors and roofs are available, like felt or silicate cotton, or concrete, that will materially impede the conduction of heat through them. These non-conducting materials are used to a small extent, but not so much for the purpose of excluding heat as for rendering walls and floors impervious to sound. We have yet to apply them to making our sitting and bedrooms cool and endurable during hot weather. How many people are unable to obtain a fair amount of sleep in a room on the sunny side of a house recent experiences will testify; the walls are kept hot during the day by the sun pouring upon them, and they retain the heat and give it out during the night in the room. If the bedroom is immediately under a roof of slate, with the sun pouring down upon it during the day, the effect is even worse, as the conduction of heat through the slate and ceiling is so much greater. This is why all roofs should be felted and boarded underneath, and an air current passed through the open space between roof and inner ceiling. This air space gets very hot, and, unless the air has a free escape, imparts its heat to the room below. A roof outlet for the heated air, and an inlet from below drawn from a cool air supply, would do much in keeping the bedroom cool; but nothing of the sort is ever attempted, and over most of our houses a hot-air reservoir exists in summer time which prevents a cool temperature being preserved. Air is a non-conductor of heat, and the space between slated roof and ceiling, of course, under ordinary circumstances, is as valuable as a resisting medium. A room, immediately below a slated covering without the ceiling, would be intolerable in hot weather. But there is a degree of external heat which renders this medium of intermediate air also intolerable, unless both the ceiling and slated covering are lined with a layer of felt or some other non-conducting material. A thick layer of silicate cotton or floss asbestos over and between the joists and the use of asbestic plaster would materially check the conduction of heat, and the same material can be applied to line walls on the inside. There are other materials sold for arresting heat, as the thick asphalted or inodorous felt sold in rolls 25yds. long, 32in. wide, sheathing felt or dry-hair felt, and prepared roofing cloth sold in rolls. The Willesden paper roofing and linings for underlining slates, either the 4-ply or 2-ply, is well known; Jones and Co.'s combination slabs, lined with silicate cotton; McNeill and Co.'s useful slag wool and felts, are all valuable for insulating, for cold storage, and for lining walls and roofs. A great deal can be done externally by preventing the rays of the sun touching the walls and roofs. We know what the ordinary outside blind is to our windows by preventing the glass getting hot. The cased Florentine blind and the "Helioscene," in casings, made of linen tick, and outside shutter-blinds, are all safeguards from the fierce heat of a Tropical sun. But we can extend the same principle to our walls and roofs exposed to the sun. We can clothe our brick walls externally with asbestic cloth, or other of the non-conducting materials above named, keeping a space of an inch or two between the blind and the wall, the blinds being made to fold or run in wood grooves or fillets at intervals. Upon our roof surfaces exposed to the sun the same covering may be placed. Thus covered by non-conducting blinds we may keep our walls and inner rooms cool and inhabitable, and a current of cold air may be made to circulate between the two surfaces if we so please. It is not difficult to show how this external mode of protection can be applied to our buildings at little cost, and involving no radical change of structure.

To keep the air of our houses cool and pure during summer is one of the conditions of health. It cannot be denied that we are far from having reached this ideal. Our large city offices and shops are far from being in a healthful condition: the unpleasant odours and vapours of a hot street from without enter and permeate them during the day, and the internal sanitary arrangements and ventilation are often disgraceful. Sometimes hundreds of men and youths—including girls—are employed in badly-ventilated rooms, often lit by gas during the day. Underground rooms are common in the City. Improved sanitary arrangements and fixtures may be found; but these protect chiefly from the poisonous gases of our sewers—they do not guarantee the supply of fresh air. To accomplish this we have to rely on a system of ventilation combined with certain precautions in building: as dry and well-drained foundations, and protection from subsoil contaminations. The latter are partially provided for by the Building Act; but we have no law yet which requires an efficient system of ventilation to be established in all city offices and warehouses. If, for example, all these buildings were provided with a series of well-arranged inlets for fresh air drawn from unimpeachable sources, with outlet ventilators on the roof in connection with flues built into the walls, with openings under the ceilings of every floor, as in the "Natural" ventilation system of Messrs. Boyle, there would be some approach to a hygienic condition. In hot weather the fresh-air supply can be cleansed and cooled as desired, in connection with a downcast ventilator leading to flues under the floors. It is not only in the City that the badly-ventilated building exists—many of our modern West End houses are without pure air: they draw their supplies through cellars or kitchens laden with effluvia, the only outlets being open sashes, which allow the vitiated-air current being carried through the rooms. There are no properly-appointed channels for the fresh or the foul air, both currents as a consequence become mixed. When will our architects insist on channels and flues for fresh-air distributing evenly at the right levels, in connection with outlets for the respired and heated air of our rooms, as being of equal importance with smoke flues?' When ventilation shall be thought to be of as much importance as a hot-water, a gas, or an electric-lighting supply, we may boast of our hygienic progress. Other things there are which go to make for perfect health, which do not consist entirely of the removal of all that is noxious and injurious to the body; chief among them the introduction of pure air and water, the maintenance of a temperature that is favourable to health and comfort, the environment of our houses and cities with all that gives relief and pleasure to the senses, and of such emotions that can be secured by the enjoyment of healthful exercise, mental relaxation, and the presence of works of art. By such a concurrence of conditions can we secure all that is experienced in the phrase, *Mens sana in corpore sano.*

ESTIMATES.—XVII.

SASHES AND FRAMES, DOORS.

FOR competitive work imported American and Swedish joinery is much used, and a great deal of it can be depended on. When large quantities are required of ordinary description, as for doors and windows, the imported joinery is much in request, and is cheaper. For a large order of one pattern or size, the best way is to obtain prices of imported Stockholm goods. Prices at the London depot are given as follows:—

		£	s.	d.
1½in. four-panel doors, 6ft. 10in. by 2ft. 10in., 1½in. square both sides,	each	0	9	4
2in. ditto	„	0	12	1
2in. moulded square ditto	„	0	13	5
2in. bead butt and square ditto	„	0	17	7
2in. moulded ditto	„	0	19	9

For a 1½in. square framed door the price above would be about equal to, say 6d. per foot super., for a 2in. moulded (both sides) door the price would be about 10d. to 1s. per foot.

Double-hung sashes and frames,		1½in.	2in.
no bars	per foot	8d.	9d.
Ditto with 8 lights	„	8½d.	9½d.
Ditto with 12 lights	„	9d.	10d.

American pine joinery is also largely imported and used when large numbers of uniform pattern and size are required. Laxton gives the following prices for doors, each:—

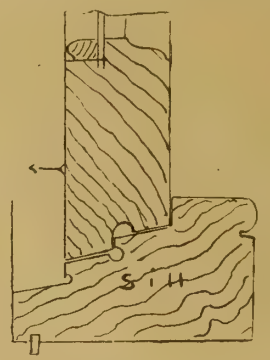
	£	s.	d.
1½in. four-panel square first quality, 2ft. 8in. by 6ft. 8in.	0	12	0
Ditto ditto 3ft. by 7ft.	0	13	6
2in. four-panel moulded both sides, 3ft. by 7ft.	0	19	0
2in. moulded and bolection moulded, 3ft. by 7ft.	1	6	3
2in. bead butt and moulded 3ft. by 7ft.	0	17	0

Sashes and frames each, unglazed:—

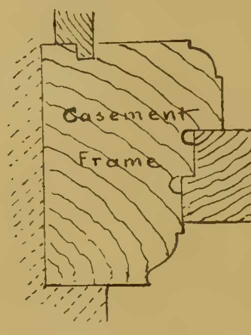
	£	s.	d.
1½in. moulded sashes, oak sunk sills, 1¾in. pulley stiles, ⅝in. inside and outside linings, double hung, 6ft. 2in. by 3ft. 6in.	0	14	9
Ditto 6ft. 8in. by 4ft.	0	16	0

These prices are below good home-made work.

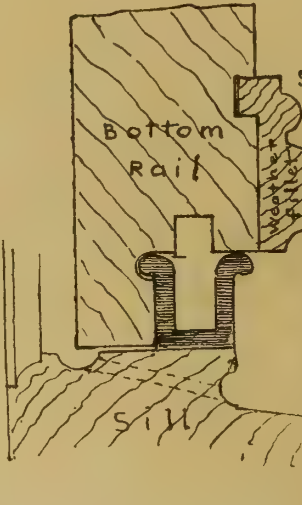
In taking sashes and frames, add 3in. to height from top of stone sill to soffit of arch, and 9in. to the external width of reveals. Semicircular heads are kept separate, and it is necessary to know if the squares are small and the bars thick.



2



1



3

It is well to remember that a common door is framed with certain widths; the stiles, top, and frieze-rails and muntin are out of deal 4½in. wide, and the bottom and lock-rail out of 9in. deal, panels out of ½in. or ¾in. deal. The square framing is the basis of the pricing, any mouldings on one or both sides and labour being priced in addition, by taking the run of the moulding by the price per foot for one or both sides of door. Mouldings add to the cost of square-framed about 1d. per foot super. each side. Having obtained the total cost, divide it by the superficial of the door, and the result is the price per foot.

The pricing of doors is obtained by finding the superficial quantity of rails, and stiles, and panels, pricing each, and spreading the cost over the area of the door, the cost per foot super. being found by dividing the cost by the superficial. It is necessary to consider the thickness; 1¼in. deal wrought both sides would be equal to 1⅜in. thick; but if the door is specified to be finished 1¼in., the deal would have to be 1½in. thick, a difference equal to about ½d. per foot. In an ordinary four-panel door the top rail, stiles, and muntin would be out of 4½in. batten, middle or lock and bottom rail out of deal 9in. wide, and panels out of ½in. or ¾in. thickness. In pricing doors it is customary to add for finished sizes 1d. per foot super. to the cost of framing, and for mouldings on one side 1d. per foot superficial. Small framings under 4ft. are worth 25 per cent. more than ordinary size framing. Spandrel framing may be taken at 20 per cent. more than rectangular, and framing circular in plan about twice that of straight. Segmental heads are worth 25 per cent. more than square, semicircular 50 p.c. more.

106ft. super. Deal cased frames and sashes as before, in two lights, with deal cased mullion in three frames.

These may be priced as in previous item, adding the mullion.

	£	s.	d.
Say, 7ft. super. in outside and inside linings 1in. deal at 2¼d.	0	1	3¾
5ft. 6in., 1¼in. pulley stiles at 2½d.	0	1	1¾
Parting beads, &c.	0	0	3½
	0	2	9

Divide by 33ft. super, equal 1d. per foot, to add to cost of previous item, say, 1s. 6d.

100ft. run. Labour splay-rebated, and grooved bottom rail to 2in. sashes (see sketch 2).

This would require 2ft. super. of 2in. deal at 4¼d. = 8½d., or about 3d. per foot run, including material. For labour, constant ·012 = 1d. per foot run.

100ft. run. Labour splay-rebated meeting rail to ditto.

This would be out of stuff 2¼in. by 2in. The labour running splayed rebate is represented by constant ·009 = ¾d. per foot run.

216ft. super. 2½in. deal ovolo moulded shop-front sashes, as shown in elevation.

If this is quite plain, with straight bars, it may be priced at from 1s. to 1s. 4d. per foot super. for straight work. For ornamental or curved bars, the quantities would have to be taken.

Labour fixing No. 2 deal-cased frames and sashes, each 28ft. super.

These are probably old sashes and frames that are to be refixed. The constant for this labour is ·007 days of a carpenter = to, say, ¾d. per foot super., or, say, 1s. 9d. each.

66ft. super. Deal cased frames and 2in. sashes double hung, circular in plan, flat curvature, in two frames.

The extra labour from bench is worth about 1s. 1d. per foot, the labour constant is ·140 = 1s. 2d. A fair price including profit.

	£	s.	d.
Deal cased frames and sashes, as before	0	1	4
Labour from bench, as above	0	1	2
Labour fixing constant ·007	0	0	0¾
Per foot	0	2	6¾

40ft. super. 2in. deal ovolo skylight, hipped at angles.

Without drawing it is difficult to state price; 1s. is a fair price for plain work, add another 1s. per foot run for hips = 1s. 3½d. per foot super. If the skylight is of particular plan or detail, it is desirable to take out quantities and allow for fixing ·010 or 1d. a foot.

60ft. super. 2in. moulded casements hung folding, with moulded stops for glass, fixed with brass screws.

If there is one bar to each casement, the material would be about 1d. per foot, the cost of labour, say, 4d. from bench, and for hanging 1d.

	£	s.	d.
Material	0	0	1
Labour (constant hour ·64) (Including fixing.)	0	0	6½
Add for rebates	0	0	0½
Moulded stops, say	0	0	1½
Brass screws	0	0	0½
Per foot	0	0	10

80ft. super. 1½in. moulded casements, hung folding to 4in. by 3in. rebated and beaded frames, with 7in. by 3in. oak double sunk weathered and throated sills in four frames.

These are ordinary sized casements, and may be priced at the average rates.

	£	s.	d.
Casement	0	0	6½
4in. by 3in. frame, with bead, &c. = 1ft. 4in. cube at, say, 4s. 6d. per foot super.	0	0	4
Oak sill	0	0	1½
Rebates	0	0	0½
	0	1	0½

56ft. super. 2in. moulded casements hung folding to 4in. by 3in. frames, rebated and beaded, and chamfered on outside with 7in. by 3in. oak double-sunk weathered and throated sill in two frames. (See sketch 2.)

For extra chamfer to frame add ½d. per foot run (say, 9d. on frame), or say, ¼d. on the super. foot, and for 2in. casements add another 1d., say, 1s. 2d. per foot.

40ft. super. 2in. moulded casements, hung to frames 4½in. by 3in., with mullion 4½in. by 2½in., rebated and moulded one side and chamfered the other to 4½in. by 3in. oak sill ditto.

	£	s.	d.
Casements and frames, say	0	1	2½
Add for mullion (equal to about 7in. cube at 4s. 6d. per foot)	0	0	0¾
Per foot	0	1	3¼

92ft. run. Labour to hook rebate to 2in. casements.

This consists of a rebate formed on the edges of both meeting stiles, with a double groove or hook joint. The labour for which may be priced with the constant ·006 in each stile, or ·012 for both. This will give about 1¼d. per foot, say, 1½d.

108ft. run. 5in. by 3¾in. frame, rebated and moulded, 3in. girth, and three times grooved. (See sketch 1.)

In each frame there is about 18ft. run, or about 2½c.ft., which at 4s. 6d. per foot cube, equals about 7d. per foot run.

48ft. run. 5in. by 4½in. framed transom, twice rebated, 3in. girth, and moulded 2¾in. girth, and four times grooved.

	£	s.	d.
Say about 8in. cube at 2s. 6d. per foot cube, about, per foot run	0	0	5
Labour in rebating and moulding	0	0	7½
Four grooves, say ¼d. each	0	0	1
	0	1	1½

60ft. run. 7in. by 3in. oak sill, framed, grooved, check throated, and twice sunk. (See sketch 2.)

	£	s.	d.
Cost of oak at 5s. per foot cube, per foot run	0	0	9
Labour from bench, twice sinking, say	0	1	1
Throating and grooving (constant ·006)	0	0	0½
	0	1	10½

16ft. run. 3in. by 2in. weather fillet, moulded and twice rebated, and fixing with screws. (See sketch 3.)

Stuff, say, 1¼d., labour rebating, ½d., moulding 1½d., fixing and screws ½d.; total 3¾d. per foot.

84ft. super. 1½in. four-panel square doors, 7ft. by 3ft.

We may take the quantities out for a door of this description thus:—

2 3 0 0 9	4 6	1½in. deal in middle and bottom rails
23 2 0 4½	8 8	1½in. deal in stiles, &c.
	13 2	
2/1 1 1 8	3 7	¾in. deal in panels
2/1 1 3 9	8 2	11ft. 9in., ¾in. deal at
	11 9	

Run of top rails and stiles we have:—

top rail..	3	0
stiles ...	14	0
muntin.	5	10
horns ...	0	4
	23	2

Pricing these quantities, we have:—

	£	s.	d.
13ft. 2in. of 1½in. deal at 2¾d.	0	2	9¾
11ft. 9in. of ¾in. deal at 2d.	0	2	0
Glue, &c.	0	0	4
Divide by 21ft.	0	5	1¾

Equal to about 3d. per foot.

	£	s.	d.
Cost of material per foot	0	0	3
Labour making, say	0	0	4½
Labour hanging	0	0	1
Cost per foot super.	0	0	8½

If moulded, we add the length of moulding on one or both sides. There would be about 30ft. of moulding on one side.

	£	s.	d.
Say 30ft. of moulding at ½d. per foot	0	1	3
Labour fitting mitres at ¼d. per foot	0	0	7½
	0	1	10½

This divided by 21ft. will give about 1d. per foot super. to add to former cost, 8½d. + 1 = 9½d. We may put this down at 1s. for moulded and square doors.

105ft. super. 2in. four-panel doors, ditto, moulded both sides.

If we take these five doors of the same size, there would be about the same quantity of 2in. deal in the rails and stiles. The cost of deal would be, say, 4d. a foot, and for the ¾in. panels 2d. Or say:—

	£	s.	d.
13ft. 2in. of 2in. deal at 4d., say	0	4	4
11ft. 9in. of ¾in. deal at 2d., say	0	2	0
Glue, &c.	0	0	4
	0	6	8

Divide by 21ft., or about 4d. per foot.

	£	s.	d.
Cost of deal	0	0	4
Labour, making and hanging, say	0	0	6
60ft. of moulding, both sides, at say, 1½d. per foot super., including mitres, &c.	0	0	4
	0	1	2

The price books put 1s. 8d. for doors of this thickness, moulded both sides.

64ft. super. 2in. six-panel doors, moulded both sides.

In this item there is a frieze rail in addition, and a little more labour and moulding; say 1d. more per foot super.

35ft. super. 2in. deal framed spandrel, partition moulded and square.

This may be priced at 20 per cent. more than rectangular framing—say 1s. 3d. per foot.

20ft. super. 2in. ditto framed circular partition, moulded and square.

We may put this at about twice the cost of straight framing. If straight framing is, say, 1s., we may call this about 2s. per foot super.

24ft. super. 1½in. two-panel moulded and square, closet doors and hanging.

These may be priced at one-fourth more than ordinary sized framing—say 1s. 3d. For hanging, add 1d. per foot, equal 1s. 4d. per foot superficial.

28ft. super. 2in. six-panel front door, bottom panels bead flush and square, the four upper panels square both sides for moulding.

Price this at 1s. 2d., and add for moulding upper panels 2d. per foot.

28ft. super. 2in. four-panel front door, bottom panels bolection moulded, the upper panels prepared for glass.

Price this at about the same—1s. 4d. per foot super.

THE ARCHITECTURAL SUPERINTENDENT.

THE following notes on the duties of an architectural superintendent were written by Mr. Edwin B. Clarke for the *Technograph*, an annual published at the University of Illinois. The duties of an inspector of buildings cannot be learned by reading, no matter how good the articles may be, yet such advice as that given by Mr. Clarke will doubtless prove of service even to those members of an architectural office who are not engaged in superintendence. What he says about explicit directions and completely figured plans deserves special attention.

The art of superintending is not only the art of fault finding, but the art of fault remedying and fault preventing. If building operations were not attended by mistakes, misinterpretations, and disagreements, it is evident there would be no need for the genus superintendent; hence, it is with the difficulties that beset him, and their remedies, that this article will chiefly concern itself.

The faulty plan is the first source of annoyance. Frequently a set of drawings is so hastily finished that omissions and inaccuracies are almost unavoidable. Contradictions and discrepancies occur between the general drawing, scale, and full sized details, and the specifications, resulting not only in annoyance and controversy, but also in no little expense and delay if not discovered before the ordering of material, or the performance of that part of the work affected by them. It should be the superintendent's first care to make a thorough examination of all plans and details, comparing them with the specifications, and with each other, in order that all errors may be discovered and eliminated before the work is begun. This examination will also aid in fixing in the mind the peculiarities which differentiate the new work from others with which he has previously been connected.

The plans furnished, the contracts should be complete. The drawings should be provided in sufficient number to thoroughly cover the work, and show plainly how it is to be done, so nothing will be left to the imagination of the builder. Mr. Clarke strongly favours numerous sectional drawings, which shall clearly show any unusual or special features or finish, and a sufficiency of dimensions to permit the execution of the work with the fewest possible arithmetical calculations by the workmen at the building.

Draughtsmen are usually reluctant to bind themselves by figures on a drawing, but unless the workmen are mind-readers—and few of them are—it is hardly to be expected that they will properly carry out the artist's idea when he himself declines to define it. In figuring dimensions, it is of advantage to give, where possible, a string of distances between centres of main features, with subordinate lines of dimension for the separate parts of those features, and also to note on each plan the bays or dormers which are to centre with some other feature of the building, above or below them. This method will materially decrease the liability of the builder to make mistakes in laying out his work, and an error when made may be quickly found and easily rectified without affecting more than a single feature. It will also be found useful to adopt a "building" line (usually the line of the first story above the water table) as a base line from which to figure dimensions, as well on the basement and foundation plans as on the first-floor plan. This building line may be shown by a red or black dotted line on the drawings.

The value of explanatory notes on drawings should not be underestimated, and the more of them there are, even though they are repetitions of items covered by the specifications, the better. The plans may be called common property, since they are used by all the craftsmen alike, while the specifications, if accessible, are usually so divided that each foreman refers only to the particular section covering his special work, and is ignorant of its relation to that of the other trades. In such cases it is evident that proper co-operation is improbable, if not impossible.

The repetition of the common lines of height on all elevations and vertical sections is to be recommended. It is quite a convenience to the superintendent, and saves mistakes arising from the builder's inclination to trust to memory rather than to turn to the plan on which the heights occur. It may be said that the contractor should be made to suffer for his own negligence; but it must be remembered that the drawings are really implements or tools, as necessary for the prosecution of the work as the trowel, saw, or hammer, and it is the duty of the architect to furnish them to the builder in as perfect a state as possible, if the final results are to be satisfactory.

Any improvements tending to convenience in handling will amply repay any extra time consumed in preparing them in the draughting room, and a day or two, or in unusual cases even a week, devoted to figuring and checking up dimensions on the working plans will avoid expensive mistakes and time-wasting delays, with the resulting disputes and controversies, and at the same time will give the plans a definiteness that will enable the estimator to make a closer proposal for the work before the contract is awarded. For the same reason it is desirable to fully indicate, by framing plans or diagrams, the kind and size of materials to be used and the methods to be employed.

It is a decided advantage to the superintendent if he has been employed in the production of the plans whose execution he is to supervise. His familiarity with the drawings will enable him to see more readily the effect that a change at one point will have on others of the work, and will be especially valuable to him when it is necessary to give an order without a chance for study or leisurely consideration.

The superintendent should secure a complete set of all drawings to be used in the work, including general plan, scale, and full size details and diagrams, outside of the sets furnished the contractors. He should also have his own copy of the specifications, and all agreements and contracts to which to refer in case of dispute between contractors concerning the scope of their respective contracts. The above applies only to the superintendent in charge of large work not in the same city with the architect, who cannot, therefore, have access to the office sets.

The first duty of the superintendent on the ground is to check up the dimensions and laying out of the building. For this a steel tape should preferably be used, and, for a long series of measurements, the ring end held at a single point while the different required dimensions are marked off in order along the length of the tape from a memorandum slip previously prepared. This prevents accumulative errors, which, with the average mason, reaches 4in. or 5in. in the hundred feet before it is considered worth noticing. In order to keep the work in hand, the superintendent should require that he shall have approved of all work laid out before building is proceeded with. To measure the width of footing trenches, a stick cut to the width of the footing, with a notch for the building line, will be found convenient. A plumb line dropped from the building line stretched above will pass the notch, and show at once if the trench is properly located and of the required size. With several different widths of footings, and for places where no line can be stretched in the excavation itself, this method should save much time and many mistakes.

If the plans show no chases or slots for soil and waste pipes, or gas, water, and electric mains, the superintendent should arrange with the mason to build them in the proper places as the walls go up. Neglect to consider this frequently leads to unsightly results—such as a group of pipes cutting through a handsome cornice, or spoiling the appearance of an otherwise attractive room. The location of the horizontal pipes should also be considered; whether in the floor—that is, between the joists—or cut over them; under the floor; hung to the ceiling below, and exposed to sight; or under a raised floor; also, whether the marble or other wainscoting back of toilet-room fixtures can set flat against the wall, or must be moved far enough forward to allow the waste, supply, and vent pipes to run behind it.

The note-book should be the superintendent's constant companion, not only for jotting down ordinary items to jog the memory for the daily details of the work, but to be used as well to preserve a record of orders to and agreements with contractors, instruction to foremen, and alterations or changes sanctioned in plans or specifications. In fact, the entries should include everything relating to the building which may possibly be needed for future reference. Especially should dates of orders and delivery of plans and details (if no record is kept in the office) be noted down, in case it becomes necessary to refer to them in settlement of claims for enforced delay in completing a time contract.

The superintendent should notice, from time to time, if all the workmen who can be advantageously employed are on the different branches of the work. He should inquire concerning the ordering of material, and the progress of the work of the sub-contractors, in order that no delay be caused by their failure to come to time. More time is thus lost than from all other causes together.

The superintendent should see that the application is made for detail drawings in such season that they will be on hand before needed for use.

It is a good plan to occasionally visit the mills, foundry, pattern, and modelling shops, to inspect the work in progress, and explain to the workmen points that are vague or misunderstood, before it is too late.

One should not be above accepting advice from contractor or workman, for fear of loss of prestige, since frequently their experience suggests methods or facts, either of merit in themselves or expedient under existing circumstances. Neither should one be so complaisant as to adopt these suggestions without careful consideration. If they are rejected, it should be done so as to leave no doubt about it in the mind of the workman, nor as to the method actually to be employed. Frequently it is necessary to say to the builder: "Your way must be just as good, but the specifications prescribe a method which I know will give results satisfactory to the architect, and, as I am answerable to him after your responsibility in connection with the work ceases, I must require you to follow the specified directions." Material or work condemned should be ordered to be removed at once. It is a common trick among foremen to agree to see to that later, with the expectation that the matter will slip the superintendent's mind until the defective material or work can be hidden or covered up.

Structural iron is usually required to have several coats of paint after delivery. In order to insure its receiving the required number of coats, and proper care in their application, and also to prevent a delay for painting and drying when the material is wanted for use, it is well to insist that this work be done as soon as the metal is on the ground.

The superintendent himself should cultivate the following characteristics: Tact, force, decision, and gentlemanliness. He will be called upon to listen to endless complaints of interference by one contractor's men with the work of the others, and is expected to arbitrate thereon. He will be referred to as a walking specification by foremen who find it more convenient to question him than to take the trouble to look up requirements themselves. This they should be encouraged to do. Some foremen ignore the specifications entirely, depending on the superintendent to assume responsibility for anything opposed to them, which he has failed to discover, but "which it is his duty to find out," as Mr. Clarke was once informed by a foreman. The same brilliant fellow was one day very much put out with me because his attention had not been called to a note on one of the plans. He had shored up a 17in. brick wall and cut an opening in it in the first story, before he discovered that it should have been torn out above also, to make way for a stud partition to take its place. Of course, the single I beam, which the note called for, while ample to support a stud partition, would hardly do the same service for a 17in. brick wall. Another nuisance is the man who always knows a better way to do everything than the way he is called on to do it (simply for the sake of change), and who is positively unhappy if his suggestions are unheeded. Of course, the superintendent ought never to lose his temper. He may lose his patience, and express his opinions; but he should let the other fellow put himself at a disadvantage by getting mad. As a general rule, however, flattery builds quicker than friction, and the greater the superintendent's skill in overcoming difficulties, expediting work, and settling differences, the better superintendent he is.—*Engineering Record.*

The Passmore Edwards public library at Launceston will be opened on Thursday, October 26th.

NATURAL VENTILATION.—III.

By Robert Boyle.

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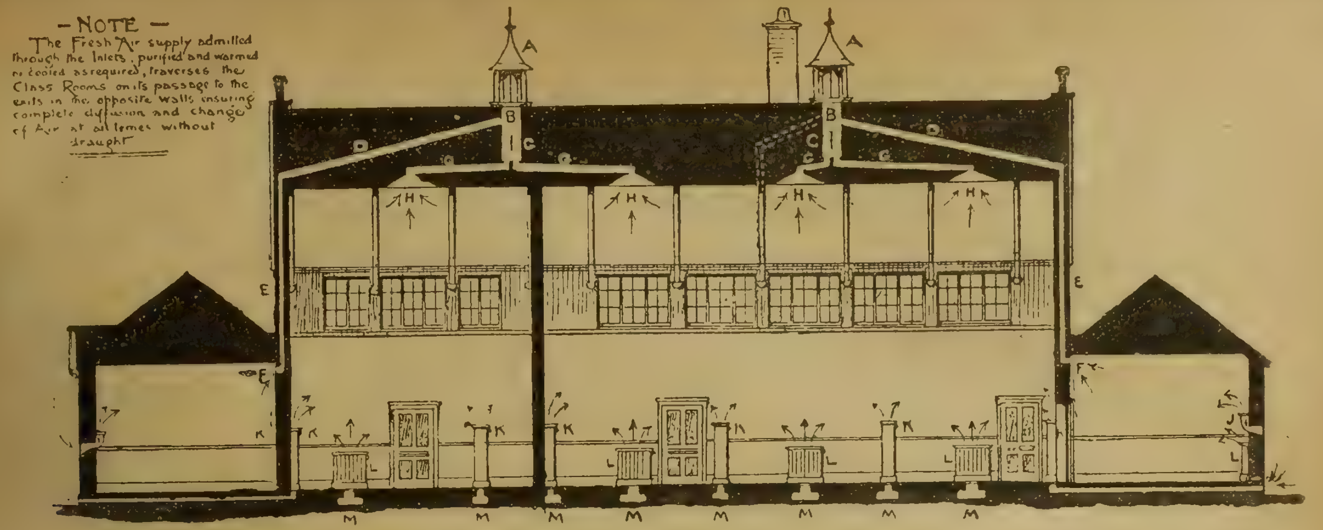
To efficiently ventilate a building with a natural system, care should be taken in the employment of ventilators that they are of correct construction, and that both the outlets and inlets are sufficient in size and number, and so placed as to effectively accomplish the work they have to do. The outlet ventilators should be fixed on the highest part of the roof, clear of all obstructions, so that the wind can reach them freely from every quarter. The fresh air supply should be properly proportioned to the extraction. The combined area of the inlets should, in all ordinary cases, be, at *least*, equal to that of the outlet shafts. Main exhaust shafts should be, at least, of equal area to the combined area of the branch pipes. Branch pipes should have as great an upward angle as possible, and should never enter the main shaft at the same level unless when parallel. All pipes should be made of metal, and circular in shape to reduce friction. Wood shrinks, and is not airtight. The vitiated air should be extracted at the ceiling, to where it naturally ascends. The fresh air should be admitted direct through the walls at a low velocity, in an upward direction, through a number of small inlet brackets or tubes distributed round the walls to secure more complete diffusion, and an equable movement of the air in all parts of the building. Air should never be admitted in cold weather in a horizontal direction, as a disagreeable draught would result. The velocity of the air-supply should not exceed 2ft. per second. The inlet channels should communicate direct with the outer air, be as short as possible, and easy of access for the purpose of cleaning. Long inlet channels are objectionable, as they harbour dirt and are difficult of access. Where simple inlet tubes or brackets are used, the tops should be about 5ft. 9in. above the floor. Where the air-supply is warmed it may be delivered at a lower level. The fresh-air supply should not be overheated, as its hygienic properties are thereby seriously impaired. Heating a building by hot air should, therefore, be avoided as injurious to health. Radiant heat is the healthiest and most effective. Where open fires are used, they should have a separate air-supply, led direct to them from the outer air through a 3in. or 4in. pipe, to prevent them drawing the hot vitiated air from above down into the breathing zone, creating draughts, and unduly affecting the ventilating arrangements.

OPEN WINDOW VENTILATION.

When a window is open at the top in cool weather, a stream of cold air passes into the room, spreads, and descends in a cold shower, cooling and pressing down the warm ascending vitiated air to be rebreathed, along with the poisonous products of combustion and the dust and dirt with which the incoming air may be charged. It is in cold weather that special ventilating arrangements that will change the air without draughts, and at the same time purify it, are absolutely necessary. In warm weather, windows can safely be left open, there being then not the same danger from draughts.

Dr. John Hayward says: "For winter, and for spring and autumn, the outer air in our climate is generally too cold to be admitted through open windows. It is, of course, impossible to warm the air as it enters before it impinges on the patients, when it is let in through open windows, and the warming is done by open fires, because the patients lie between its entrance and the means of warming. I am aware that some medical practitioners do recommend hospitals to be ventilated only by open windows on both sides of large wards, even in winter, in this climate, and maintain there is neither risk nor discomfort in doing so. They do not themselves, however, submit to such ventilation—that is, they do not themselves sit in their study or have their families to sit in the morning room or sleep in bedrooms with windows to the east open all the winter through. And it is only bounce for matrons and nurses to acquiesce in such an arrangement and uphold it; they are themselves not confined to beds underneath open windows, but are moving about in and out of the wards. Nor do they submit to it in their own rooms during cold easterly windy days and nights. The helpless patients scarcely dare complain, or


- NOTE -
The Fresh Air supply admitted through the Inlets, purified and warmed or cooled as required, traverses the Class Rooms on its passage to the exits in the opposite walls ensuring complete diffusion and change of Air at all times without draught
A
A
B
B
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— LONGITUDINAL SECTION —

A NATURAL SYSTEM OF VENTILATION AS APPLIED TO A SCHOOL WITH CENTRAL HALL.

a, Roof ventilator. *b*, Main extraction shafts. *c*, Regulating valves. [Note.—The whole power of the ventilators may at any time be applied to either the central hall or classrooms by opening and closing their respective valves.] *d*, Branch pipes connected with extraction-flues in walls of classrooms. *e*, Extraction-flues in walls communicating each with two rooms. *f*, Foul-air outlet from classrooms into extraction-flues. *g*, Branch extraction pipes from central hall. *h*, Ventilating openings in ceilings. *j*, Air-inlet brackets admitting purified air; may be fitted with air-warmer or cooler, as required. *k*, Air-inlet tubes admitting purified air; may be fitted with air-warmer or cooler, as required. *l*, Ventilating radiators admitting warm, purified air. *m*, Fresh-air supply-pipes to interior tubes and radiators.

even admit that they feel a draught, if the nurse says they do not."

OPEN-FIRE VENTILATION.

Though an open fire undoubtedly acts as a powerful exhaust, it is well known to sanitarians that no more dangerous mode of changing the air in a room exists, owing to the currents of cold air set up towards it from doors and windows, causing disagreeable draughts to be experienced by those in its vicinity, or in any part of the room which the currents traverse. The upper strata of air in the room, charged with the heated products of respiration and combustion, is drawn downwards towards the fire and inhaled by the occupants, who are thus compelled to continuously rebreathe exhausted and impure air.

Dr. Hayward considers that "For hospital wards open fires are risky, costly, and troublesome; they greatly embarrass all plans of ventilation, and are in many other ways objectionable. They are of but little use as means of ventilation: they certainly abstract air, but they take it principally from near the floor, whereas the foul air accumulates near the ceiling, being heated, and so made light, by the same means that foul it. Hospitals warmed only by open fires are sure to be very imperfectly warmed, and if at the same time they are attempted to be ventilated by open windows, they are most certainly also very imperfectly ventilated. It is much to be regretted that some hospitals are professed to be ventilated and warmed by simply open windows and open fires even throughout the winter in this climate."

OPEN-PIPE VENTILATION.

It is almost invariably found that where plain open pipes are used, or have merely a cap on the top to exclude rain, they are stopped up on account of the down-draught experienced.

"Gusts of wind will sometimes cause a reverse action in the tube. In hot weather, if the shaft is colder than the outer air a down current may ensue.

"In consequence of the numerous causes of disturbance enumerated, this method of extraction, when applied to a house, could not be relied on to act on all occasions with certainty as an extraction shaft."—(Sir Douglas Galton, F.R.S.)

REVOLVING VENTILATORS.

Revolving ventilators soon get out of order, particularly if employed for the ventilation of drains or sewers, as the gases quickly corrode the working parts, rendering the ventilator worse than useless, owing to the down-current which results in consequence of its ceasing to revolve with the required rapidity.

"The objection to a movable ventilator is that, if by any accident it failed to turn, it would become a powerful inlet."—(Sir Douglas Galton, F.R.S.)

LOUVRE-BOARD VENTILATORS.

Louvre-board ventilators were originally designed for the purpose of preventing the weather from passing into a ventilating shaft. The large body of air which it admits at the top of the shaft, and which is supposed to pass across from one side to the other and thence out, simply acts as a damper upon the ascending current, and in cold weather particularly passes down the shaft, cooling and precipitating the vitiated air, and causing a disagreeable down-draught.

AIR ANALYSIS.

In buildings such as hospitals and asylums an analysis of the air might be made periodically, as the medical superintendent would, in most cases, be qualified to judge if the tests were correctly made, if he did not make them himself. In other buildings, such as churches, halls, schools, workrooms, &c., there would be some difficulty in securing reliable analysis, there being so many conditions under which tests may be made that might render them misleading and valueless as indicating the general purity of the air.

It is notorious that, in spite of elaborate tables of analysis of the air of many public buildings in which the most complete forms of artificial ventilation are in use, the condition of the air in these buildings is not found by those occupying them to be in accord with the analysis, so far as their sensations are concerned.

In a recent report on the ventilation of the Houses of Parliament, the following passage occurs:—"When one considers the enormous volume of air, equal to ten times the cubic contents of the House of Commons, which is passed through it every hour, also that the elaborate tables of air analysis are apparently all that could be desired, and yet the ventilation is notoriously bad, it is clear that there is something very radically wrong with mechanical ventilation by impulsion, and that tables of analysis and of volumes of air passed through a building are not to be accepted as correctly indicating either the general purity of the air or the efficiency of the ventilation."

Analysis of the air is a very good thing so far as it goes; but it may, with some reason, be objected that it does not go far enough, for all the tables of analysis in the world will not convince people that the air of a building is pure if they, from their own actual experience and the unerring test of their senses, are satisfied that it is not so.

After all, the feelings of the occupants are the surest index of the state of the air in a building, and should in most cases be accepted as conclusive, irrespective of air analysis, which, however desirable, is not always to be relied upon. If the air but smells fresh and sweet, and there is an absence of that feeling of *malaise* and discomfort usually experienced in a badly-ventilated building, most people are content to look upon air analysis as a negligible quantity, though they may not always be correct in doing so.

VENTILATION TESTS.

Reports of ventilation tests are misleading, unless the exact details of the systems tested are given, and the conditions under which each has been applied and tested are clearly stated, as one system may have been applied and tested under the most favourable conditions, whilst another may have been incompletely applied and tested under unfavourable conditions. Where these particulars are not given, all such tests must be considered as valueless as a means of comparison.

Experiments have been instituted from time to time for the purpose of ascertaining, if possible, the exact values of exhaust ventilators by testing them on specially-arranged pipes. The results of these tests were found, however, to be so conflicting, that it is now considered by sanitarians that experiments of this kind are valueless as a means of determining which is the most effective ventilator under all conditions. The "Kew experiments" inaugurated by the Sanitary Institute may be cited as a well-known example.

The *Times*, which was selected by the Institute to publish the report of the tests, said: "The method of testing was incorrect, and therefore the tests are valueless. Neither in the case of the cowls, nor of the tubes, was their true value as extractors ascertained." This method of testing has also been discredited by so-called "experiments" carried out by certain cowl-makers and patentees of rival systems, when it was found in each case that the results were exactly reversed.

There is only one reliable way of testing ventilators, and that is when they are in actual use. Their efficiency can only be determined when they have been tried for a lengthened period in every season of the year, and under all conditions of the weather and of the buildings to which they may be applied.

(*To be continued.*)

THE SANITARY INSTITUTE.

THE twenty-eighth course of lectures and demonstrations for sanitary officers on Mondays, Wednesdays, and Fridays, September, October, and November, 1899, will comprise the following lectures:—

Part I., fee £1 1s. Six lectures on Elementary Physic and Chemistry in relation to Water, Soil, Air, and Ventilation. Two lectures on Elementary Statistics, Meteorology, and Local Physical Conditions.

Part II., fee £1 11s. 6d. Eighteen lectures on

Public Health Statutes: orders, memoranda, and Model By-Laws of the Local Government Board, and the by-laws in force in the Administrative County of London. The practical Duties of a Sanitary Inspector, *e.g.*, drawing up notices as to sanitary defects, drain-testing, disinfection, methods of inspection, note-taking, and reporting. Municipal Hygiene or Hygiene of Communities: including prevention and abatement of nuisances, sanitary defects in and about buildings and their remedies, water supplies, sanitary appliances, drainage, refuse removal and disposal, offensive trades, disinfection. Building construction in its sanitary relations. Measurement and drawing plans to scale.

Inspections and demonstrations will be arranged in connection with the lectures, and will include visits to disinfecting stations, dairy premises, municipal depots, artisans' dwellings, offensive trades, waterworks, common lodging-houses, sanitary works in progress, refuse and sewage-disposal works, and other public and private works illustrative of sanitary practice and administration. In some of the visits the students are shown the routine of an inspector's office work and duties.

Part III., fee, £1, seven lectures on Meat and Food Inspection, including taking of samples of water, food, and drugs for analysis. Practical demonstrations of meat inspection will be given. The various subjects to be dealt with will be given by well-known authorities, and will be illustrated with diagrams, drawings, models, and lantern slides. The lectures will include the subjects scheduled for the examinations of the Institute and the Sanitary Inspectors' Examination Board (formed by the Sanitary Institute and other bodies). The museum of sanitary appliances and the library will be open free during September, October, and November, to students attending the course. Arrangements are made by which students can obtain the loan of books for a small payment. The fee for the complete course is £3 3s. Students who enter their names for one of the examinations of the Institute, at the time of taking their ticket for the lectures, can have 10s. 6d. carried towards their fee for examination. Members and associates of the Institute are admitted to the lectures without payment, but cannot introduce friends. Students and others desirous of attending the lectures are requested to send in their names at once to the secretary of the Institute, Margaret-street, W. Candidates residing within the county of London, who attend or wish to attend these lectures may enter the competitions for the evening science exhibitions, awarded by the Technical Education Board of the London County Council of the annual value of £5, which may, with the approval of the Board, be applied to paying their expenses in attending these lectures. Application forms and particulars of these exhibitions must be obtained of the secretary of the Board, 116, St. Martin's-lane, W.C.

POLYTECHNICS AND SKILLED TRADESMEN.

THE evidence published in the Report of the Sub-Committee of the Building Trades, recently adopted by the Technical Education Board of the London County Council, is of considerable interest to builders and the employed. We have already given the recommendations of the Committee and a summary of the evidence. Large firms of builders and others engaged in building are almost unanimous in their opinions that the training given at polytechnics is good and useful up to a certain point: but the training does not turn out boys as skilled tradesmen. Allowing a certain degree of bias in their opinion, it is certainly not reasonable to expect skilled workmanship from men who have never been taught in the builder's workshop or on the scaffold. The environment of the classroom and technical workshop was more or less conjectural and theoretical; the youths were set certain lessons, or set to perform certain exercises of manual labour in bricklayers', masons', carpenters' and joiners', or smiths' work that were useful as speculative work, and as showing a dexterity in using tools and certain methods of setting out. Such work was confined to doing a few things not in connection with the building; it was a piece of gauged brickwork, without reference to other adjoining brickwork; it was executed quite apart from everything else—not on a scaffold. And so with regard to other trades. The manual skill performed was conditioned by nothing outside it;—it was completely isolated. The polytechnic classes were useful in teaching young men engaged in the trades to acquire a theoretical knowledge of setting out work. Even large building firms like those of Messrs. Colls and Sons encourage their hands to attend classes such as those of the Great Titchfield-street Trades School. The evidence given by one of the firm is instructive on this point. The report quotes this gentleman's views. Only the best men who could take the lead should be taught drawing and building construction at evening classes. The "technical workshop" attracted men to the classes, but was valueless when used as a producing shop. These are opinions generally shared by the trade, and science and art classes were attended by men who wished to become acquainted with general principles of building construction. A knowledge of reading drawings was essential to every mechanic who wished to be more than mere workmen, and this was a chief inducement to enter a technical school. As Mr. Colls said, bricklayers were not so well able to read technical or working drawing as carpenters, who on that account made better foremen of works. On the other hand, notwithstanding the inferior training of the bricklayer, he often was a good workman, a fact which our American friends, who boast of the superior training of their workmen, would do well to bear in mind. Manual skill depending largely on a correct eye may be acquired without the knowledge of being able to draw on paper conventional representations. The "best way to teach a workman his trade is to let him work in the daytime on the scaffold, and in the evening attend classes where only theoretical instruction fully illustrated is given." The intention of the authorities should, it is stated, not be to try to turn out finished workmen, but to supplement the training on the scaffold by theoretical teaching. The same witness remarked that while theoretical instruction was necessary to make the men more proficient, there were plenty of very good carpenters and other men who had no such training. The evidence of builders' foremen pointed to the advantages of class instruction, and the encouragement of apprentices to attend classes; but there is a settled opinion among foremen that class teaching did not make better workmen, but they could do their own setting out, and did not require so much attention as others. Referring to bricklayers, the same witness stated they were not good workmen, and did not understand their work, nor did they attend classes. From the whole evidence we gather that the advantages of attending classes and technical workshops are acknowledged even by those who have not themselves been trained in them. Builders and foremen alike admit the training promotes the intelligence of the apprentice, and, by the knowledge of the technical drawing taught, the men can read drawings and set out their own work. These are unquestionable advantages to all building artificers. Everyone who has had to do with bricklayers, carpenters, joiners, and other trades, will at once recognise the value of this knowledge; how it facilitates the communication of ideas to the craftsman; how it saves the time of foremen and clerks of works, who are otherwise called to set out the work or to explain details, and how much better the work can be performed if those trusted with the execution know how to read the architect's drawings aright. On all hands, the bricklayers were the least disposed to avail themselves of technical instruction. They do not care to attend classes, and, according to one witness, this trade were less industrious as workers than they were years ago. At one time a bricklayer laid as many as 2,000 bricks a day; now he only laid about 500 or 600. This reduction was due to the men themselves, not by any action of the trade-union. The general foremen had, on the other hand, more to do in setting out their work. These allegations are by no means flattering to the trade as it now is. It is undoubtedly true that the better men in the trade, many of whom are now foreman, have attended trade classes at the technical institutes, and had learned something of drawing and building construction, and were enabled to read plans and set out work. No doubt there is some mistrust as to those who teach in the schools and as to whether they are really practical men who have had any real acquaintance with building; workmen, as a rule, have little sympathy with those who have not been through the trades, and it is satisfactory to learn that the Builders Foremen's Association contemplates appointing a sub-committee to take up the subject, and to visit the trade classes and report the result to the Board as soon as practicable.

SANITARY SPECIALITIES.

SEVERAL excellent sanitary specialities are to be found in the illustrated catalogue of the Water Carriage Engineering Co., Ltd., iron and brass founders and sanitary engineers, of Mowbray-street, Sheffield, and of 13, Victoria-street, Westminster. We notice Merrill's patent basin latrine, with automatic flush and siphonic discharge, for any number of persons—a very economical arrangement. It is fitted to a 4in. or 6in. foot-pipe and siphon, and for factories or workshops is indispensable. The basins are made in brown ware; there is a galvanised iron flush-tank, a foot-pipe, outlet siphon at one end or centre of the range, flushing pipe, &c. Nothing can be simpler or less liable to get out of order, and the flushing and siphoning arrangements are perfect. The price of a range with 4in. foot-pipe for five persons is £10. Another form of range closet well adapted for schools or workmen is Merrill's patent trough closet, made in brown stoneware to an ovate section, which is fitted with a flat top and unpolished seat, 16in. by 16in.; the outlet is at one end. The open-top trough with seats covering the top is a simple form, and cheap. In section it forms three-quarters of a circle, and the trough rests on bricks, it can be fixed with top edge about 22in. above floor. The prices are very moderate. The patent automatic flushing siphon made by this company for flushing sewers and drains, for water only, or sewage, with water supply to small cistern. For a 4in. siphon, salt-glazed, with double trap and cast-iron cistern, the price is £3, and is capable of flushing a 6in. drain; a 6in. siphon, to flush a 9in. drain, is £4 10s. The siphons are made up to 15in. diameter, and these do for 3ft. of water in tank. This siphon is made also in cast iron.

Several good forms of closet are illustrated. We notice Merrill's patent siphonic-discharge closet as a very economical apparatus of pedestal form, with white basin, a lead or earthenware trap, and a two-gallon siphon cistern on brackets. The price is from £4 18s. for the basin, trap, and siphon cistern, with extras for polished mahogany seat, decorated basin, &c. The "Niagara" patent siphon cistern and wash-down basin is another cheap closet arrangement. Other forms of wash-down closets, with S or P-traps, fitted with the "Niagara" cistern, are illustrated; also Merrill's patent seat-action closet, side-hinged seats. The mahogany or walnut waste-preventers, lined with lead or copper, with Niagara siphon action, are an improvement in appearance on the cast-iron preventer, which are extremely ugly additions. The waste preventers are carried on brackets of the same wood. A very cleanly hospital sink, glazed ware sinks, marble and slate-top lavatories, and slate lavatories supported on brackets with continuous waste-pipe, are shown on pages 12-15. The open channel waste is a good arrangement in some situations. We noted also Merrill's stoneware urinal, a very great improvement on the old iron backs and sides; the arrangements shown for schools, with salt-glazed backs between brick piers, are excellent. Other pages show a capital self-emptying lavatory, singly or in range, baths, and various other appliances. The workmanship and details are of the highest quality, and we advise our readers to get a copy of the catalogue of the Water Carriage Engineering Co., Ltd., before specifying sanitary fittings.

◆

Mr. Alan Cole is superintending the vacation art classes at the Royal College of Art at South Kensington, and is acting as principal of the college pending the appointment of a successor to Mr. Walter Crane.

The Interim-Clerk of the Police Department of the Glasgow Corporation, Mr. John Lindsay, has, in conjunction with the Master of Works, Mr. White, prepared a Buildings Regulation Bill for the city, and a draft has been submitted to the committee which deals with the subject. The committee will hold evening meetings for the purpose of going through the Bill, with a view of its early presentation to the corporation. The Bill is planned on much broader lines than the last measure, the object being to bring it into line with the latest municipal Acts obtained by other corporations both in England and Scotland.

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ILLUSTRATIONS.

NEW BUSINESS PREMISES, SAUCHIEHALL STREET, GLASGOW.—SECOND PREMIATED DESIGN FOR LEYTON PUBLIC BATHS.—LXXVII. AND LXXVIII. GRACECHURCH STREET, E.C.—WORKMEN'S DWELLINGS AT BANGOR.—"THE JOLLY SAILOR," HANHAM, BRISTOL.—HOUSE AT WALSALL.—NEW BAPTIST CHURCH AND SCHOOL, ACTON BRIDGE, NEAR NORTHWICH.—RELIGIOUS INSTITUTE, MANCHESTER.

Our Illustrations.

NEW BUSINESS PREMISES, GLASGOW.

This building, which occupies a prominent position in Sauchiehall-street, one of the principal thoroughfares, incorporates an existing structure which, to a certain extent, dominates the design. The area is divided into three sections, separated by fire walls. The centre section, which is emphasised by the dome, contains the entrance and main staircase. The various floors are reached by an elevator in the well of staircase. The two eastern sections are lit by open wells having glass roof above. The architects are Messrs. John Honeyman and Keppie, 140, Bath-street, Glasgow.

LEYTON PUBLIC BATHS.

This design was recently submitted in competition. The accommodation comprises two swimming-baths, and thirty slipper-baths. The ladies' baths, of which there are ten, are placed on the first floor over the entrances. The administrative part of the establishment includes a boiler-house, laundry, and the usual accessories. The estimated cost is £13,000. The author of the design is Mr. J. Williams Dunford, to whom the second premium was awarded.

LXXVII. AND LXXVIII. GRACECHURCH STREET, E.C.

This building, occupying an important frontage to Gracechurch-street, with return frontage to Ship Tavern-passage, has just been completed and occupied as offices. The site included the entrance to Leadenhall Market, through Ship Tavern-passage, the old archway of which was pulled down, and the new entrance and archway leading to the market is now a portion of the new building. This to a certain extent, as will be seen, determined the design of the building. The building is of fireproof construction throughout, including the roof, which is covered in copper. All the floors are of ample heights, and well lighted to the open air on three sides. The front is in Portland stone, and some figure sculpture and carving has been well carried out by Mr. M. Lawlor. The building was erected by Messrs. Hall, Beddall, and Co., from the designs of Mr. Howard Chatfeild Clarke. Owing to the restrictions of opposing neighbours, a slight variation had to be made in the upper story of the front.

WORKMEN'S DWELLINGS, BANGOR.

These dwellings are, we understand, erected in the neighbourhood of Bangor, and form a compact and useful block, the plans of which are self-explanatory. The front treatment is simple, and not unpicturesque. The materials used are brick to the head of ground-floor windows, above which is rough-cast. The gables and roof being tile-hung, thus the rough-cast and red tiles give colour to the block. Mr. D. J. Roberts, of Bangor, is the architect.

"JOLLY SAILOR," HANHAM, NEAR BRISTOL.

This house has recently been erected at Hanham, near Bristol, for the Bristol Brewery, Georges and Co., Ltd. The materials of which the buildings are composed are local bricks with Bath-stone dressings, the roof being covered with Broseley tiles. The general contract was in the hands of Mr. J. Perkins, and the plumbing and sanitary works were carried out by Messrs. J. Hunter and Son, both of Bristol. Messrs. Walter S. Paul and James, AA.R.I.B.A., of Bristol, were the architects.

HOUSE AT WALSALL.

The house illustrated by us has just been erected for Mr. W. E. Blyth, J.P., on the Highgate-road, about one mile from Walsall. It is situated on the slope of a hill, with the principal rooms at the back commanding an attractive and extensive view across the valley, with the Beacon Hills in the distance. Immediately below are the formal gardens, arranged in terraces, with the tennis lawn at the bottom. The house is entered by an overhanging porch into a large galleried hall, with staircase starting from a central position and winding round. The ingle has been contrived under the stairs, with open panelling and specially designed leaded lights. The hall will have a wax-polished wood-block floor, and is so arranged as to form an easy connection to the three principal rooms without destroying its value as a habitable room if required. The drawing-room will have a floor of oak boards in narrow widths, and will be stained and wax polished; the ceilings have moulded plaster cornices and ribs. The room is divided into two parts by an archway, supported on square taper columns, moulded caps and bases. By this arrangement the smaller room may be converted into a boudoir, and will have direct communication with the conservatory. The dining-room will have a stained-wood cornice and ribs, and a comfortable and roomy ingle-nook, with windows overlooking the terraces and tennis lawn. The space above the ingle has been fitted with casements glazed with leaded lights, and forms a convenient place for the storage of curios, &c. The kitchens and pantries have been so arranged as to form a back hall, which acts as a servery from kitchen and dining-room, thus avoiding the objectionable cross traffic. The bed and dressing rooms are all arranged on the first floor, with the exception of one attic. The whole of the internal fittings have been designed in a plain and simple style, suitable to the homely character of the house. The work is being carried out from the designs of Messrs. T. W. F. Newton and Cheatle, 39, Newhall-street, Birmingham, in an able and satisfactory manner by Mr. John Mallin, of West Bromwich.

NEW BAPTIST CHURCH AND SCHOOL, ACTON BRIDGE, NEAR NORTHWICH.

The subject of this sketch, now approaching completion, is situated close to Acton Bridge Station, Cheshire, and is to replace the present building at Ouston, which is both too small and inconveniently situated for the present congregation. The church is arranged to seat 200. There is an organ chamber on one side, and the schoolroom, in the form of a long transept, on the other, with two vestries in the rear. The schoolroom is to hold 100, and is separated from the church by means of two pointed arches fitted with folded doors, so that on special occasions it can be thrown open to the church, and thus provide accommodation for a congregation of 300. The baptistery is under the Communion platform, and will be finished with cream-coloured glazed tiles, with steps at each end. The elevations are in red pressed bricks and red Runcorn sandstone. The architect is Mr. Francis P. Halsall, A.R.I.B.A., Post Office-avenue, Southport; and the contractor Mr. Samuel Appleton, Northwich.

RELIGIOUS INSTITUTE, MANCHESTER.

We gave an exterior perspective and plans of this design on July 7, and now give sections. The architects of the design are Messrs. Woodhouse and Willoughby, as stated in our description on p. 9 *ante*.

◆

The partnership heretofore subsisting between J. C. Dear and W. H. Winder, architects and surveyors, Southampton-row, W.C., under the style of Dear and Winder, has been dissolved.

COMPETITIONS.

Bradford.—At Tuesday's meeting of the city council it was reported that, in regard to the architectural designs for the proposed market extension, premiums had been awarded; the first to Messrs. T. C. Hope and Son, of Bradford, and the second to Messrs. Mawson and Hudson, of Bradford.

◆

CHIPS.

The Smallpox Hospital, Whitmore Common, Worplesdon, is being warmed and ventilated by means of Shorlands' patent Manchester stoves with descending smoke-flues and patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

At the meeting on Monday of the town council of Shrewsbury Messrs. John Taylor, Sons, and Santo Crimp presented a report on the various schemes of water supply for the borough, and it was received and left over for considration.

A destructive fire occurred on Monday evening at 174, Great Dover-street, Southwark, the premises of Messrs. J. Stayner and Sons, builders and decorators. It broke out in the carpenters' workshops, comprised in a structure of two floors, extending 25ft. by 20ft. This building was gutted, and a second larger building of three floors, 30ft. by 20ft., used as offices for dwelling, was attacked, and the two top floors were burnt out. The damage to the contents of the premises is covered by insurance in the North British and Mercantile.

It is proposed to rebuild the parish church of Ystrad Meurig, in Cardiganshire, the native place of Edward Richard, who, from obscure beginnings, rose to a high position as a teacher, and was distinguished as a classical scholar. He taught his pupils in the church. On his death, in 1777, he left his property to the school which he had founded, and where many of the Welsh clergy have since been educated. The old parish church now lies in ruins, and service is held in the schoolroom.

Mr. G. E. Carter, of Bristol, late assistant surveyor to the Long Ashton Rural District Council, has, out of 37 candidates, been unanimously appointed surveyor to the urban district council of Cartmel.

In response to an invitation from the auctioneers of Ireland, the Auctioneers' Institute of the United Kingdom will visit Dublin in September. On Thursday, September 7, the council will be the guests of the Irish auctioneers at a banquet at the Hôtel Métropole, Sackville-street, presided over by the Lord Mayor. Friday, September 8, will be occupied with council and committee meetings, Mr. W. Roland Peck, president, in the chair. In the evening a smoking concert will be given at the Métropole. On Saturday, September 9, the visitors will be conducted over the brewery of Messrs. Guinness and Co., and will be driven through Phœnix Park and on to the Lucan Hotel to luncheon.

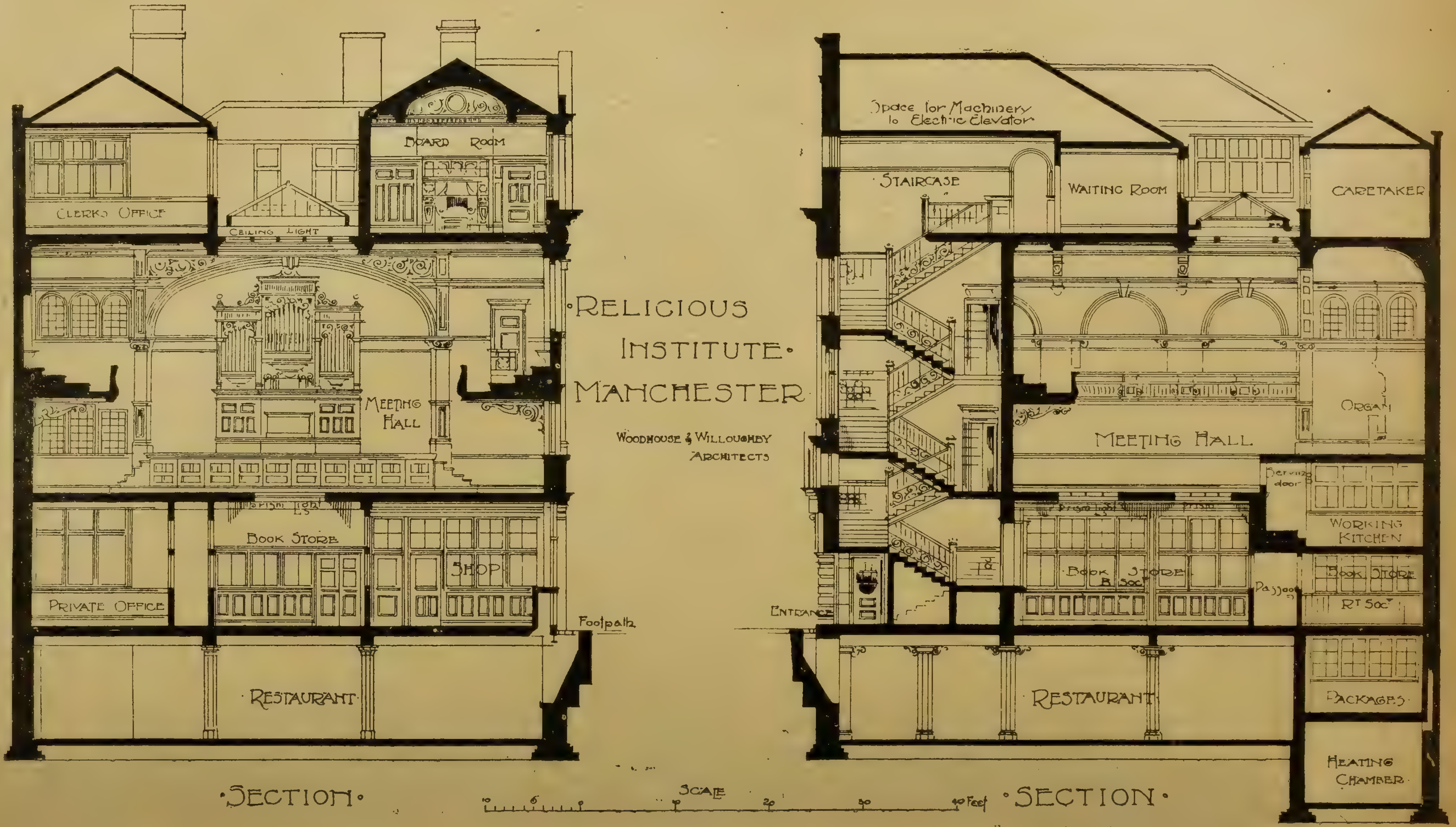
It having been decided to place a reliable clock in the tower of Wensley Parish Church, Wensleydale, Yorks, the order has been placed with Messrs. Wm. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne, who are making a new illuminated clock for the Working Men's Club, Newburn, Northumberland, and a large illuminated quarter-chime clock for Dundalk, Ireland, and a new hour striking clock for Walton Parish Church, Suffolk.

A life-size bust of Mr. Gladstone was unveiled on Saturday at Penmaenmawr, North Wales. The memorial, which stands on a slope commanding a sea view, consists of a bust of bronze on a massive obelisk and base of polished granite, bearing on one side the single word "Gladstone," and on the right side, "Statesman, orator, and scholar," while on the reverse are the dates, "29th of December, 1809, to 19th May, 1898." On the back is inscribed, "Erected by public subscription." The work is by Mr. Albert Toft, of Chelsea.

The old yew tree that for centuries stood by the well in the parish of Llanfechain, near Oswestry, was recently blown down. Its wood is being converted into a mensa for the new cathedral at Inhambase, in the diocese of Lebombo, the carvers being Messrs. Harry Hems and Sons, of Exeter.

The organ in the district church of St. John the Baptist at Felixstowe was reopened last week after enlargement by a choir organ. Messrs. Norman and Beard, of Norwich and London, were the builders. The new chancel added to the same church was dedicated by the Bishop of Norwich on Wednesday.

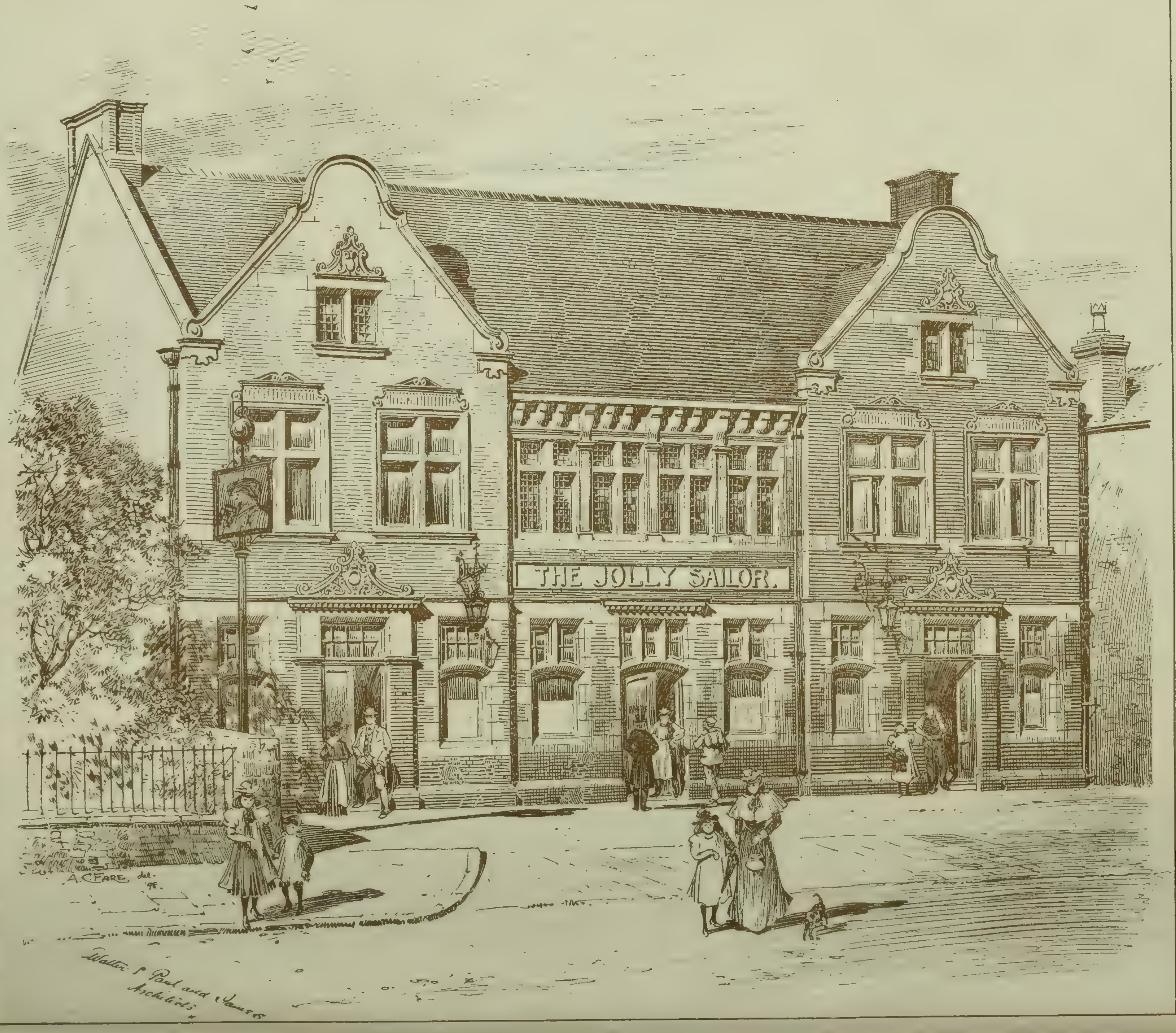
The Right Rev. Bishop Brownlow, of Clifton, formally opened on Monday the new day-schools which have been erected in Victoria-road, Swindon, in connection with the Holy Rood Roman Catholic Mission. The schools have been erected at a cost of £4,633, exclusive of the interior fittings, &c.

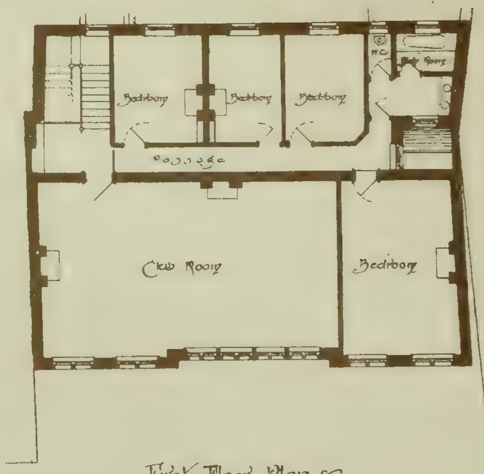


·RELIGIOUS
INSTITUTE·
MANCHESTER·

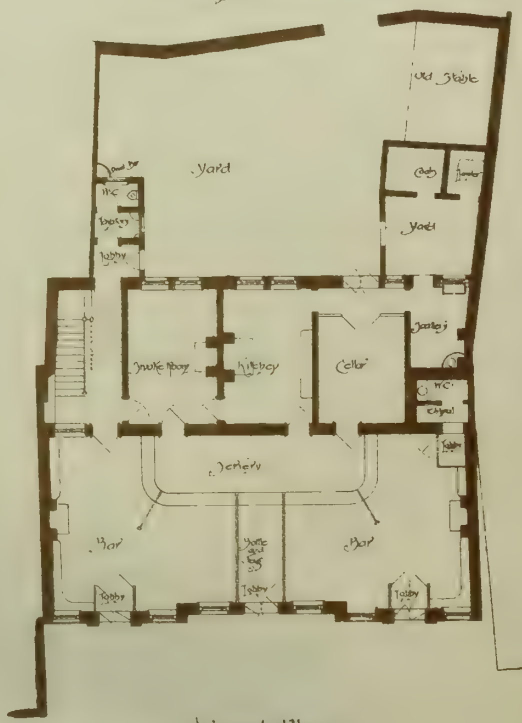
WOODHOUSE & WILLOUGHBY
ARCHITECTS

THE JOLLY SAILOR HANHAM BRISTOL PAUL & JAMES ARCHTS.


THE JOLLY SAILOR.
A. C. Fare del. 98.
Walter S. Paul and James FS Architects



First Floor Plan.



Ground Plan.

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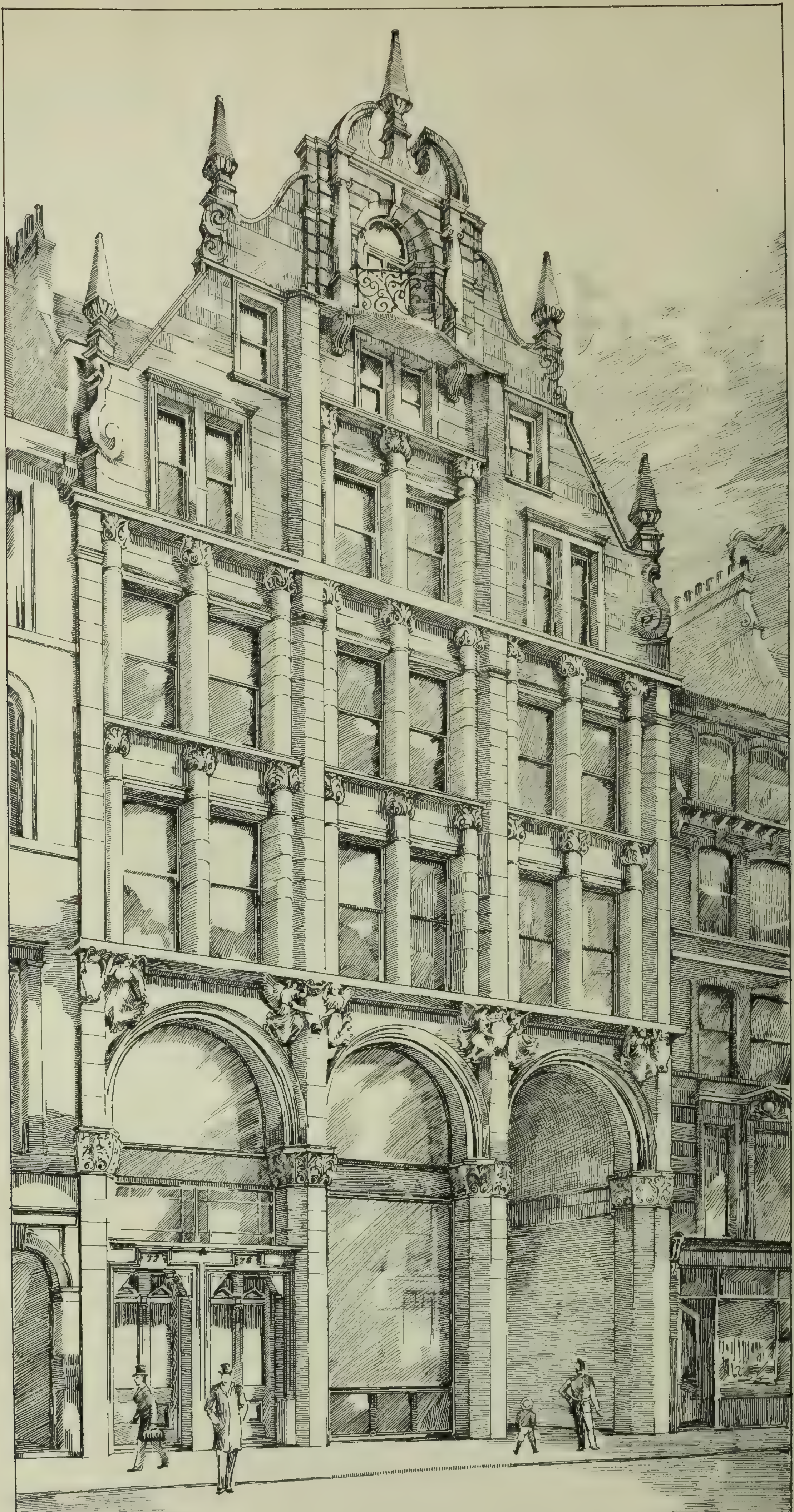

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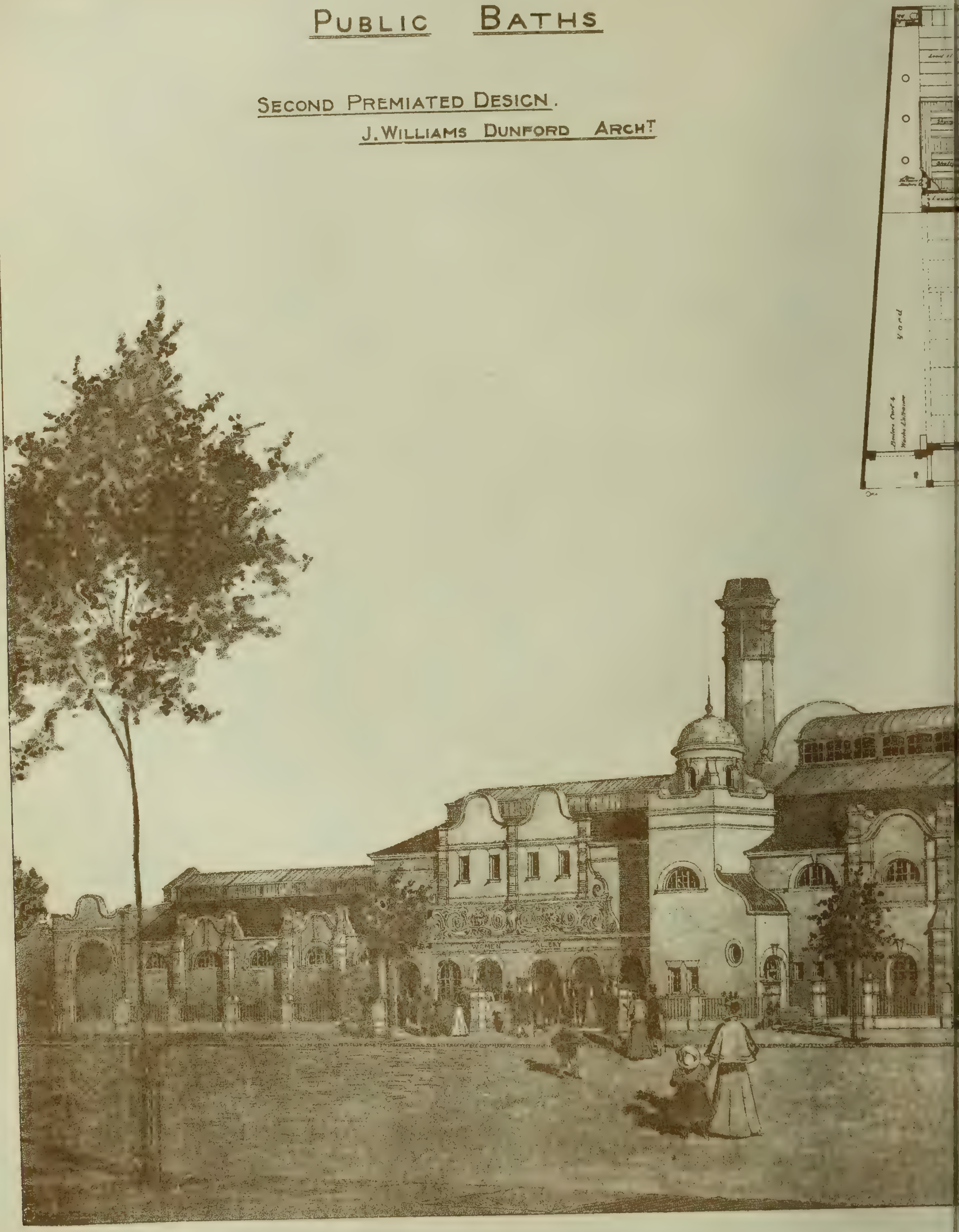
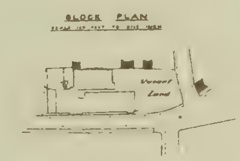
77 AND 78 GRACECHURCH ST HOWARD CHATFEILD CLARKE ARCHT.

THE LEYTON URBAN DISTRICT COUNCIL

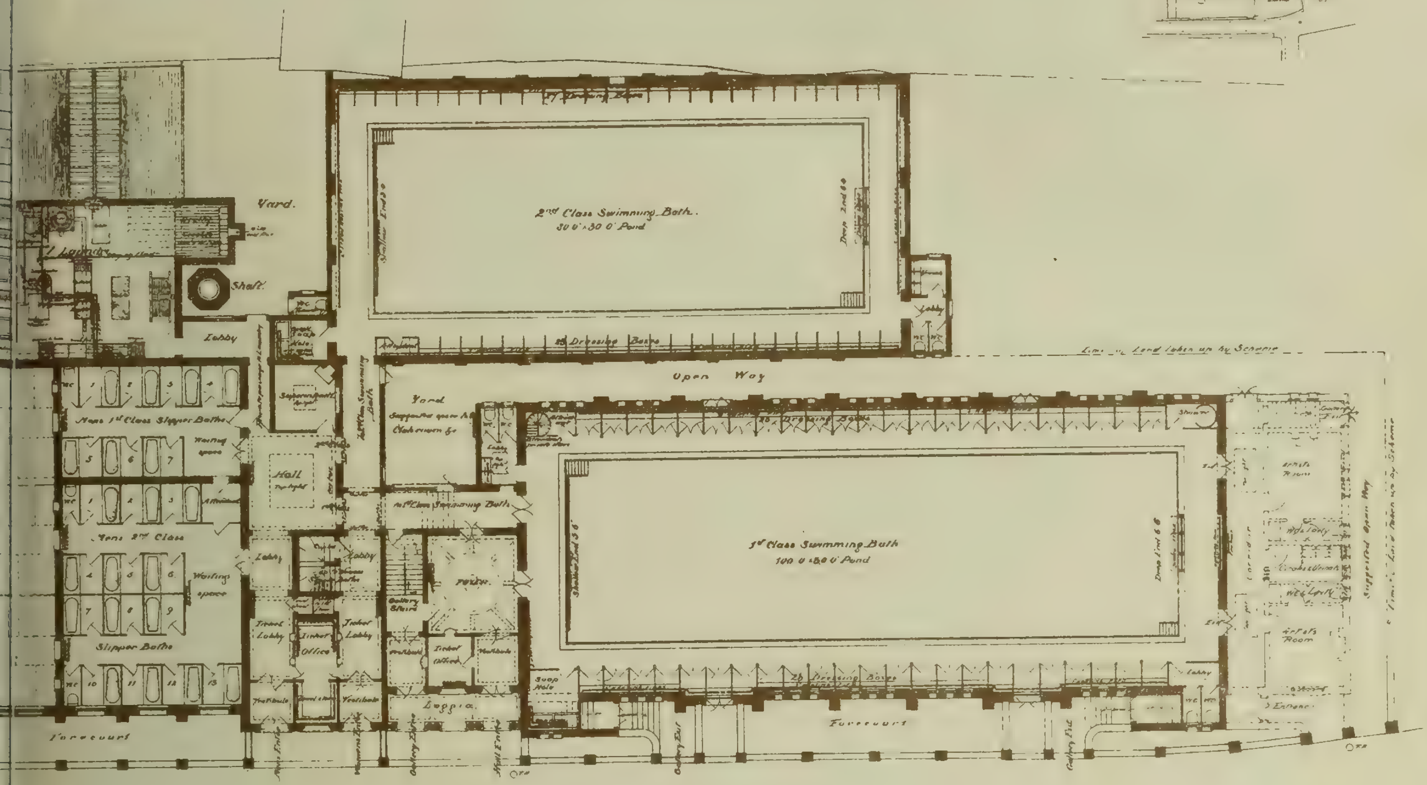
PUBLIC BATHS

SECOND PREMIATED DESIGN.
J. WILLIAMS DUNFORD ARCHT

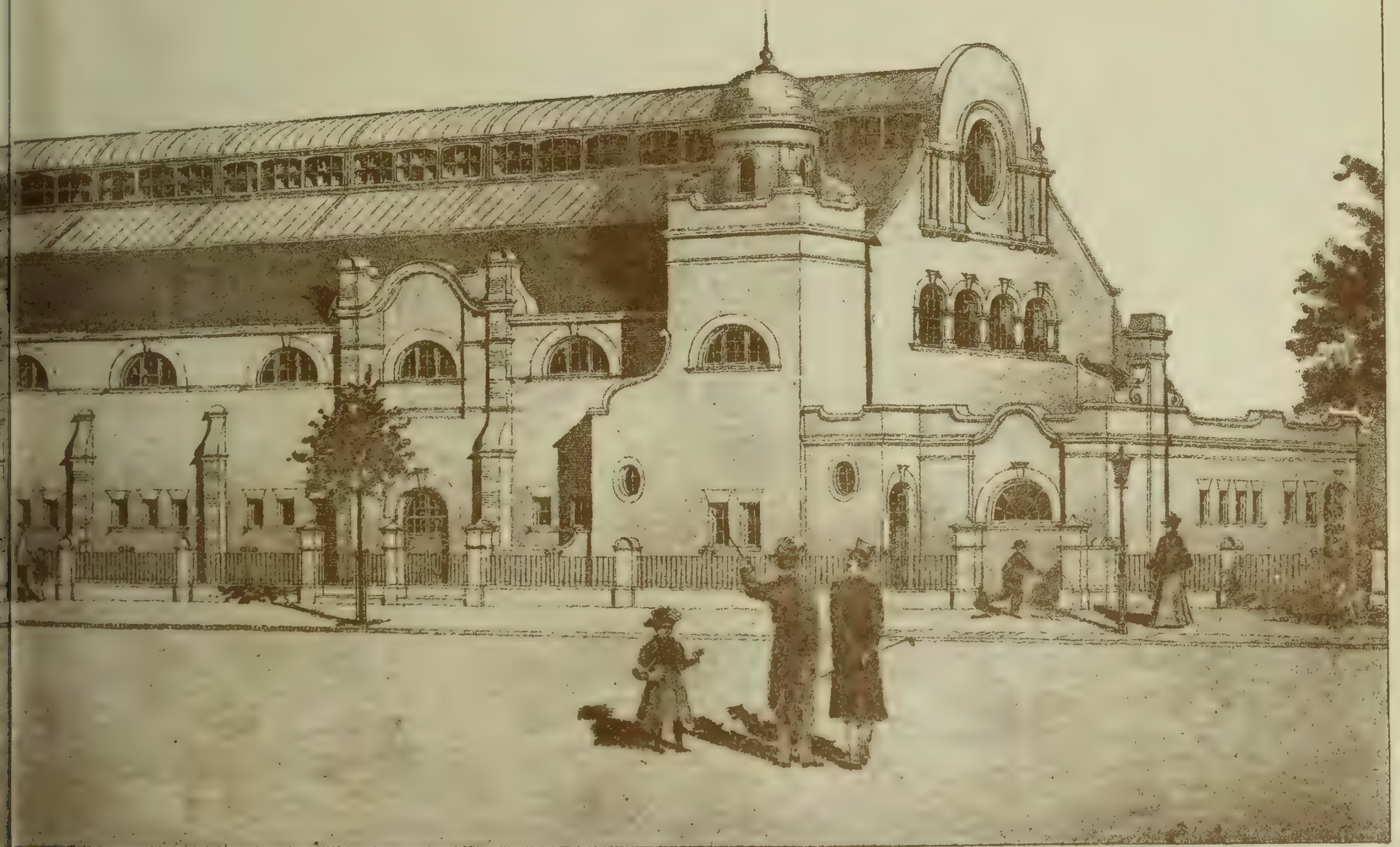




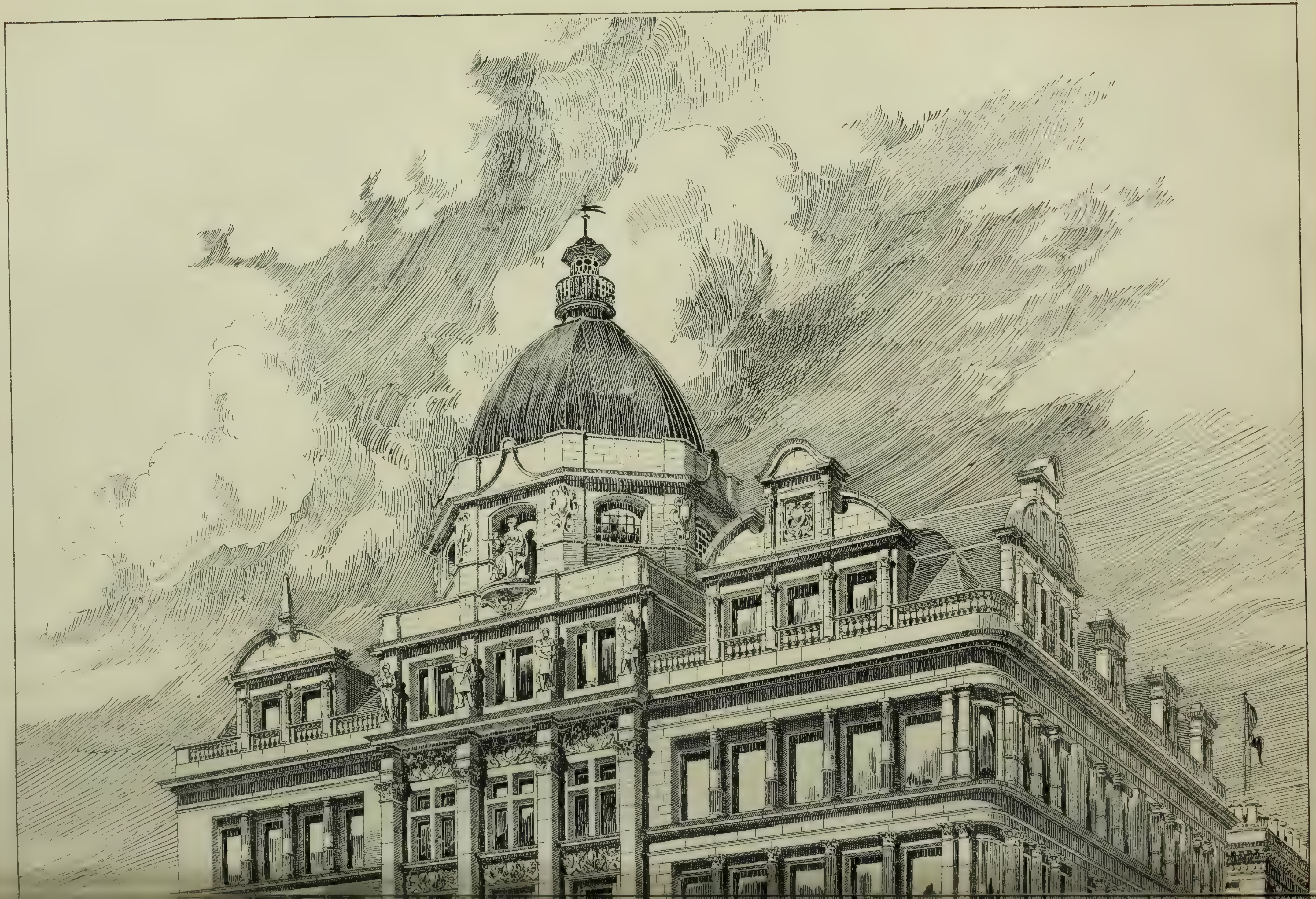
BLOCK PLAN

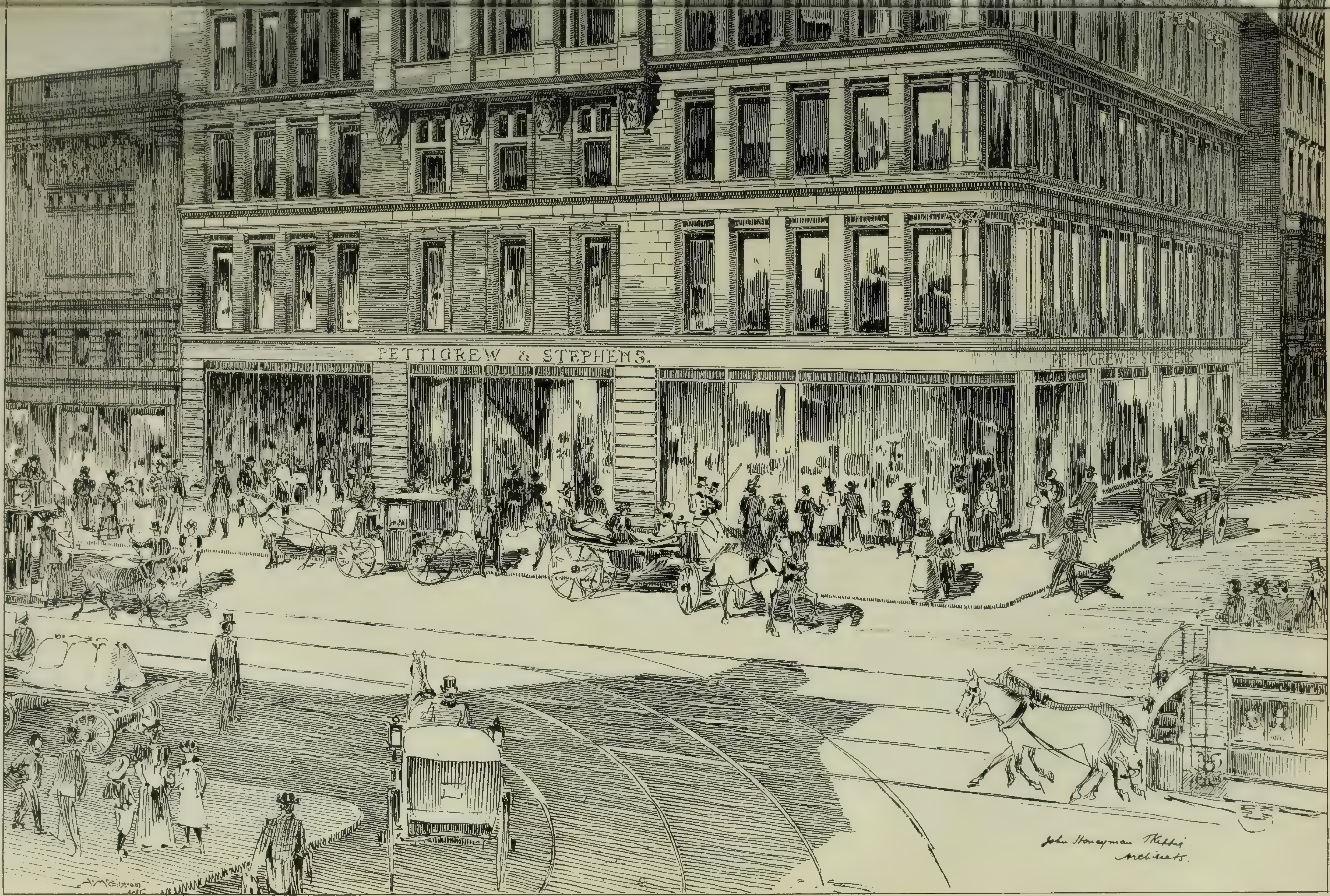


GROUND PLAN



"PHOTO-TINT," by James Akerman 6 Queen Square, London W C





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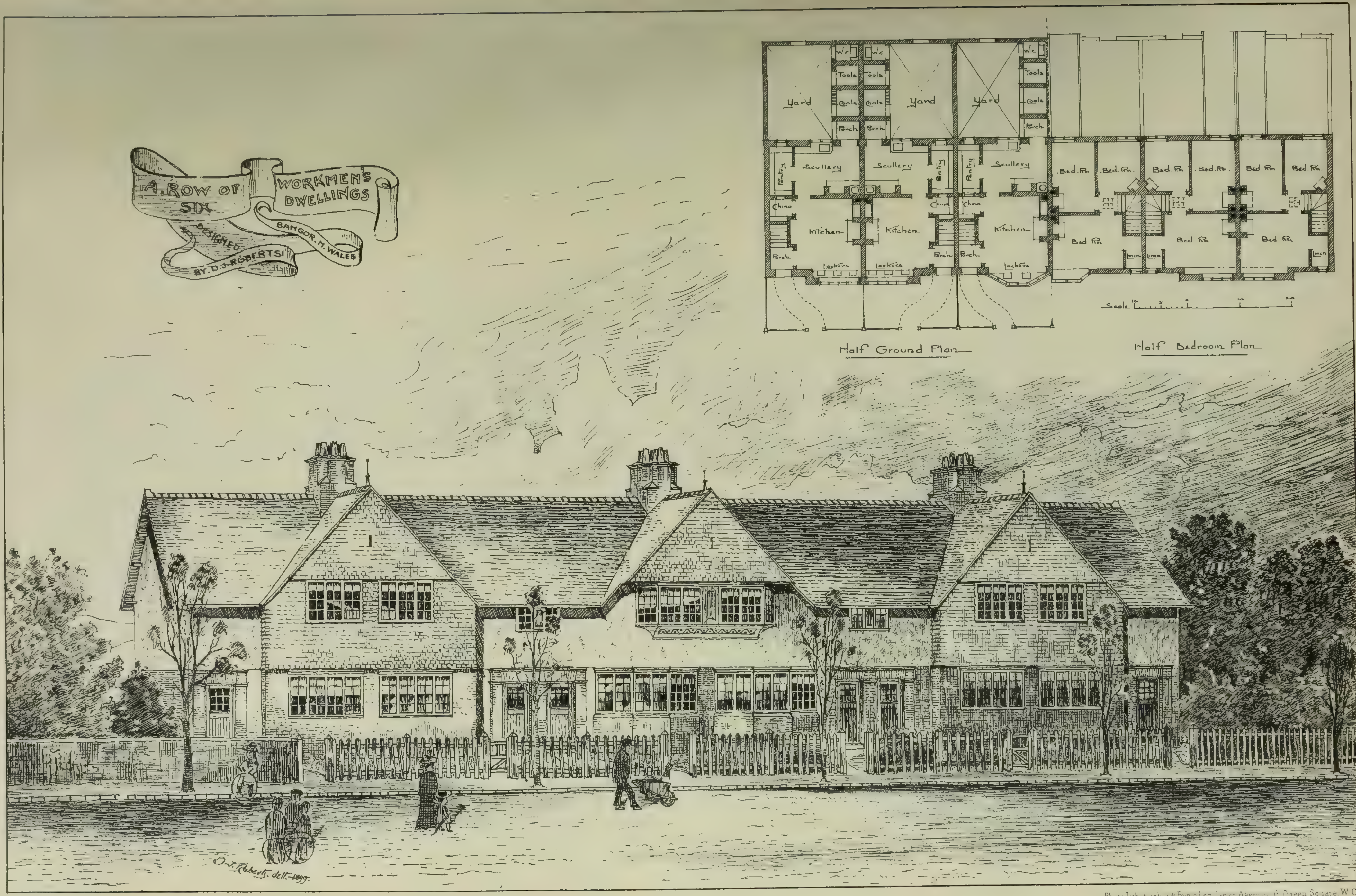
·NEW BUSINESS PREMISES SAUCHIEHALL ST GLASGOW·

HONEYMAN AND KEPPIE ARCHITECTS



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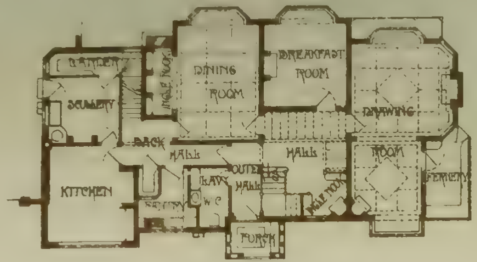
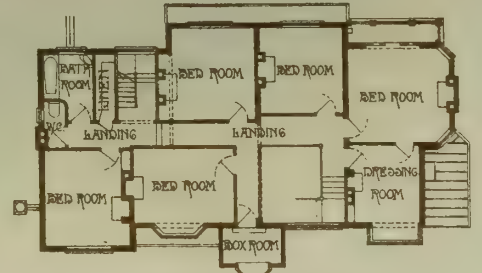
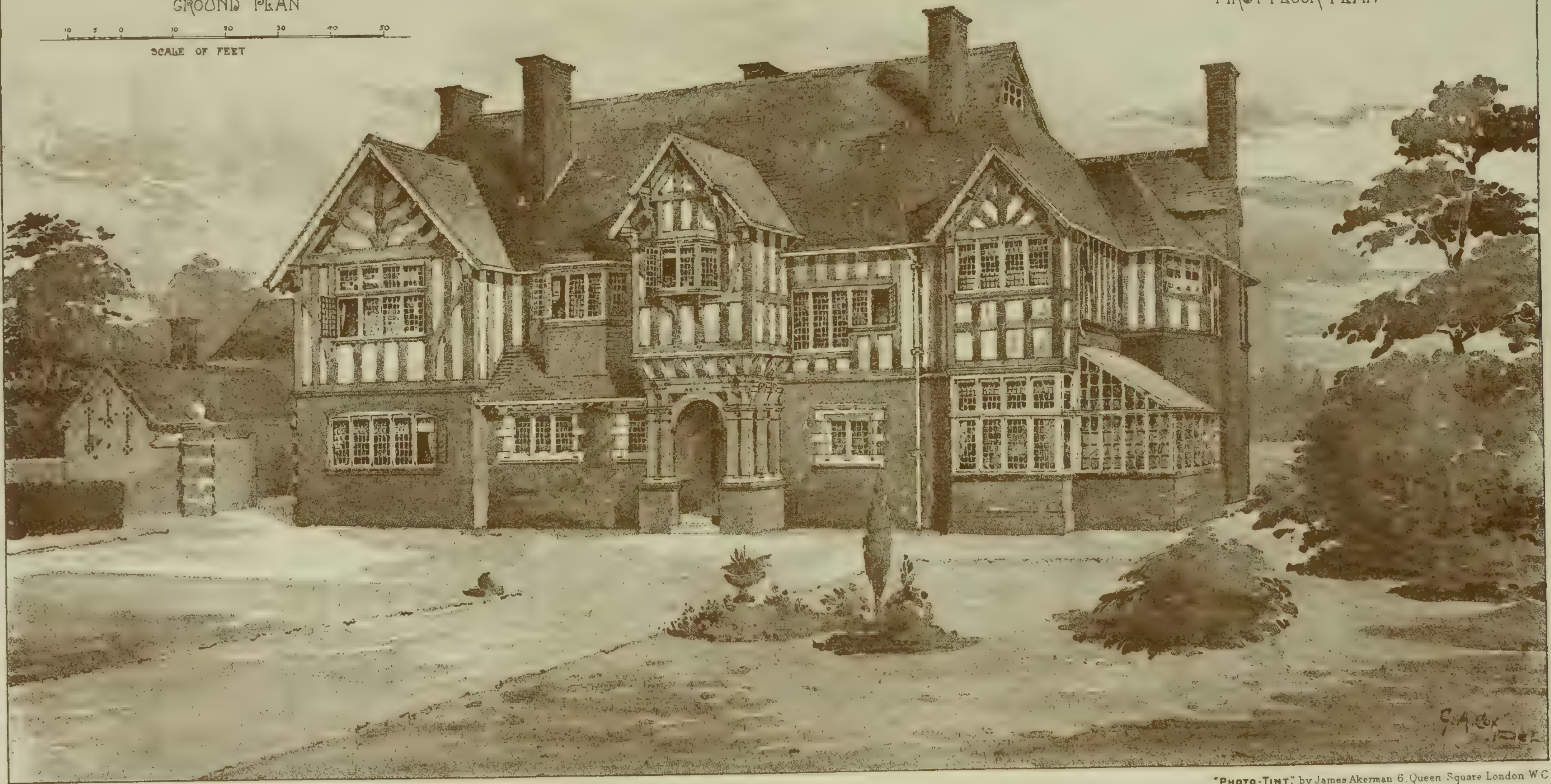


GROUND PLAN

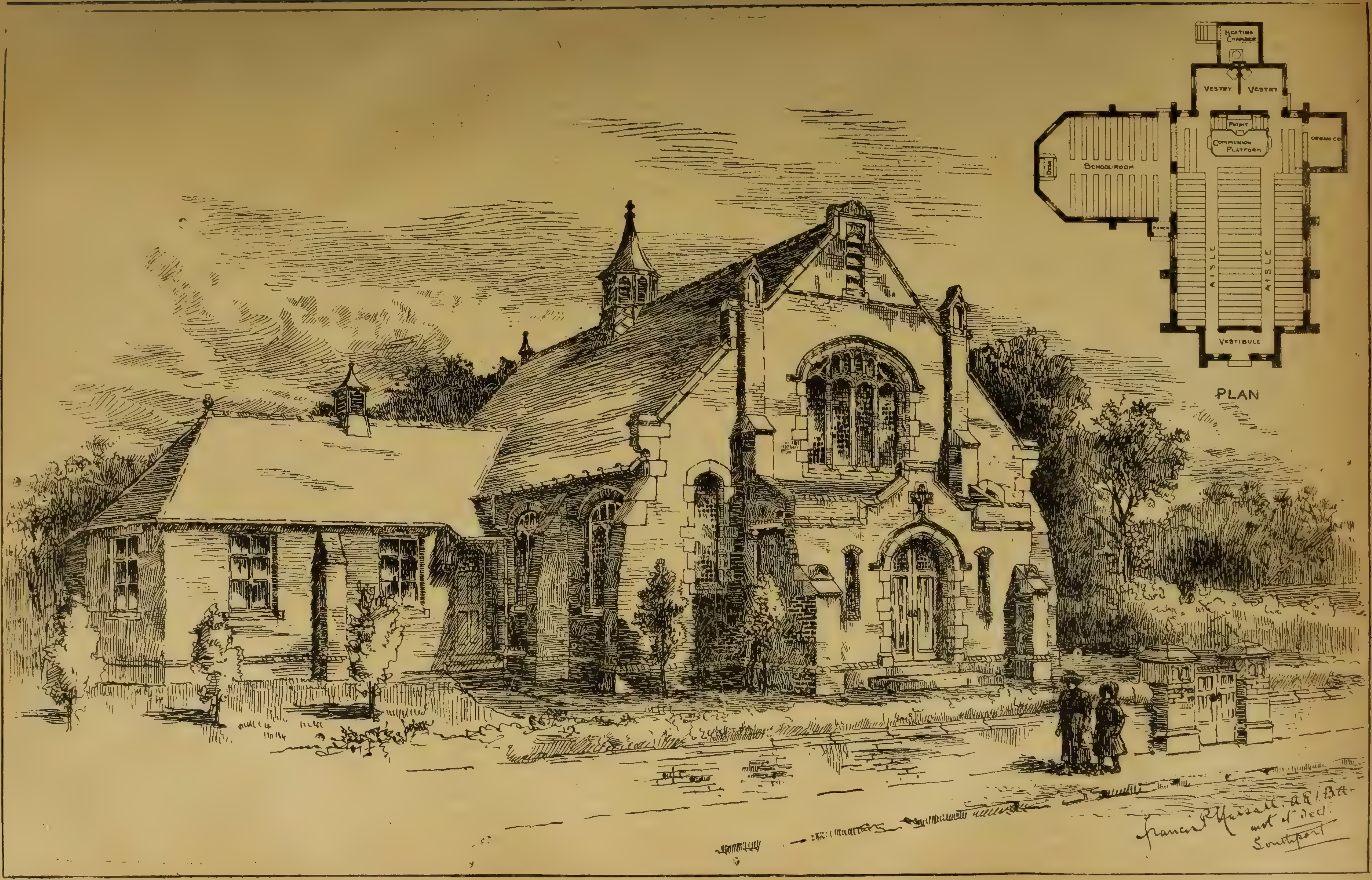


FIRST FLOOR PLAN



"PHOTO-TINT," by James Akerman 6, Queen Square London W.C.

· HOUSE AT WALSALL · NEWTON AND CHEATLE ARCHTS



NEW BAPTIST CHURCH AND SCHOOL, ACTON BRIDGE, NEAR NORTHWICH.

ROBERT BOYLE AND SON, LTD.—A PLEASANT RECOGNITION.

MESSRS. ROBERT BOYLE AND SON, LTD., Ventilating Engineers, 64, Holborn Viaduct, have been honoured with the following communication from the Foreign Office, accompanied by the diploma therein referred to, which has been presented to Messrs. Boyle by the International Congress of Hygiene and Demography, in recognition of the service rendered to the public health by the introduction of their system of ventilation.

> The Under-Secretary of State for Foreign Affairs presents his compliments to Messrs. Boyle and Son, and is directed by the Secretary of State for Foreign Affairs to transmit to them the accompanying diploma, which has been received through her Majesty's Ambassador at Madrid from the Ninth International Hygienic Congress held last year in that city.
>
> Foreign Office, August 10, 1899.

The Spanish Government have employed the Boyle system of natural ventilation in a large number of public buildings in Spain, including the Chamber of the Cortes Government Offices, barracks, forts, hospitals, &c., and Messrs. Boyle have received a number of valuable reports in respect of these buildings. Mr. Robert Boyle during his "sanitary crusade" through Europe devoted considerable attention to Spain, and helped to awaken a deeper interest in that country in improved sanitary measures.

WOOD SEASONING BY ELECTRICITY.

THE method of wood seasoning by electricity is described as follows in a report by Consul E. T. Liefeld at Freiburg:—"The positive pole of a dynamo is connected with a lead grating, upon which the wood to be treated is placed. A solution, which is kept at the uniform temperature of 100° Fahr. by means of a steam-pipe underneath the grating, is poured into the vat so as to almost cover the log of wood treated. At a public demonstration, the solution used contained 10 per cent. of borax, 5 per cent. of resin, and three-fourths of 1 per cent. of carbonate of soda, the borax being used on account of its antiseptic properties, and the carbonate of soda to help dissolve the resin. A porous tray, the bottom of which consists of two sheets of canvas with a sheet of felt between, is placed over the log, and a sheet of lead connected with the negative pole of the dynamo is placed above this. When the current is turned on, the solution is drawn from the bottom and the sap is driven out, and its place taken by the borax and resin; the time required for a 10in. log is about seven or eight hours, and then the wood is slowly dried, which takes in the open air in summer several weeks or even months."

OBITUARY.

SIR EDWARD FRANKLAND, C.B., F.R.S., the Government analyst of the Metropolitan water supply, died in Norway on Wednesday in last week. He was born on January 18, 1825, at Churchtown, near Lancaster, and was educated at the Grammar School of his native town, whence he proceeded to the Museum of Practical Geology, where he continued his studies, completing them at the Universities of Marburg and Giessen, the University of Marburg, which is in Hesse-Cassel, conferring upon him the Ph.D. for his dissertation upon the discovery of a method for isolating ethyl. Upon returning to England he devoted himself specially to investigations in a new field of organic chemistry, and in 1851 was appointed Professor of Chemistry in the then recently-founded Owens College, Manchester (now the Victoria University). He filled the chair for six years, when he was elected to the Professorship of Chemistry at St. Bartholomew's Hospital, continuing his researches into the new series of organic bodies containing metals. In 1863 he resigned his chair at St. Bartholomew's upon his appointment as Professor of Chemistry at the Royal Institution of Great Britain, Albemarle-street, and, after filling this position for two years only, again resigned—this time to become Professor at the Royal College of Chemistry (School of Mines). Here for twenty years he carried on his life's work, retiring in 1885. In 1868 Professor Frankland was appointed a Royal Commissioner, in conjunction with Sir W. Denison and Mr. J. Chalmers Morton, to inquire into the pollution of rivers, the result of their inquiries, which extended over six years, occupying as many large reports. In 1880 he issued his *magnum opus*, "Experimental Researches in Pure, Applied, and Physical Chemistry." "How to Teach Chemistry" and "Water Analysis for Sanitary Purposes, with Hints for the Interpretation of Results" are other more recent and most useful little handbooks. His annual Reports to the Local Government Board on the chemical and bacteriological condition of the Metropolitan water supply were commenced in 1865. Sir Edward Frankland, in 1870, received the Honorary D.C.L. degree from the University of Oxford, and in 1884 that of LL.D. from Edinburgh; in 1871 he was elected President of the Chemical Society, and in 1877 became the first President of the Institute of Chemistry. He was Honorary Foreign Secretary of the Royal Society, and Her Majesty conferred upon him in 1897 the distinction of a Civil Knight Commander of the Bath.

Engineering Notes.

BARROW.—The Furness Railway Company obtained Parliamentary powers in the 1899 Bill for the construction of one of the largest graving docks in the world. The dock, which will be constructed alongside the present entrance basin to the Ramsden Dock, will have an entrance 100ft. wide from Walney Channel, and a similar width of entrance into the Ramsden Dock. The dock will have 30ft. depth of water, and will be about 1,000ft. in length. Before commencing with this work the Furness Railway Company are busy in deepening the sill of the Ramsden Dock by 6ft., making a clear passage through all the docks for all vessels of 30ft. draught, and up to a width of 100ft. This work will occupy nearly twelve months to complete. A temporary home for the navvies is being arranged alongside the dock, and here about 400 of them will live in "club life" till the work is finished. The sinking of the sill will close the Ramsden Dock for twelve months, and in the mean time traffic will have to be conducted through the Devonshire Dock.

NEW PONTOON DOCK FOR ABERDEEN.—Within the next few weeks the new pontoon dock, which is being constructed for the Aberdeen Harbour Commissioners, will be floated round the East Coast from the Thames to Aberdeen. The dock is being constructed by Messrs. Clark, Stanfield and Co., London, at their building premises near Tilbury. The dock is constructed wholly of iron. It is "L" shaped, being known as the offshore design of pontoon dock, on to which a vessel may be floated either from the ends or "broadside on." It will be located meantime in the Albert Basin, opposite the Fish Market, where, for attachment purposes, heavy steel columns are being inserted on the face of the quay wall. The dock is 126ft. long and 37ft. beam, and is being constructed in order chiefly to accommodate trawlers up to 420 tons dead weight, the idea being to relieve pressure on the graving dock, leaving that dock free for merchant vessels. The pumping and other apparatus of the dock will be worked by electricity, supplied from the corporation mains, and it will be lighted by eight powerful arc electric lamps. The total cost is slightly over £8,000.

* * *

Dr. C. K. Millard, of Birmingham, has been appointed medical officer of the borough of Burton-on-Trent, in place of Dr. Robinson, who has been engaged in a similar capacity by the Leicestershire County Council.

The War Office have entered into a contract with Messrs. Armitage and Hodgson, of Leeds, for the erection of a new barracks at Winchester at a cost of £43,000. The barracks are to be ready for occupation in two years.

Walter Hadden, aged 47, formerly a master builder, late of Gower House, Euston-road, W.C., committed suicide by shooting himself at the residence of his brother-in-law, No. 14, Woodstock-road, Poplar. The evidence at the inquest showed that the deceased had recently failed in business, and seemed to feel his position very acutely. The jury returned a verdict of "Suicide whilst of unsound mind."

Lord Tredegar on Wednesday week laid the foundation-stone of the Pontywaun County School at Pontymister. Accommodation will be given in the dual school to 60 boys and 40 girls, and it will cost, according to the accepted tender of Mr. J. Pritchard, £3,495. The plans have been prepared by Messrs. G. Rosser and R. L. Roberts, Abercarn.

Building Intelligence.

BRIDLINGTON. — The Bridlington Grammar School was opened on Wednesday week. The school is built in the Renaissance style, and is a two-storied building. The ground floor contains the main hall and schoolrooms, and the dormitories are upstairs. There is accommodation for from thirty to thirty-five boarders, and from seventy to seventy-five day scholars. The flooring is of the herring-bone pattern, in pitch-pine. Attached to the school is a chemical laboratory. The architect was Mr. Bilson, Hull; and the clerk of works Mr. W. H. Williams; the builders being Messrs. Thompson, of Peterborough; and the total cost will be about £10,000.

WIGAN.—The New Royal Court Theatre, Wigan, was opened on Bank Holiday. Mr. John P. Briggs, Effingham House, Arundel-street, London, is the architect. The entire auditorium has been reconstructed. The two tiers, which are arranged with dress circle, four private boxes, family circle, upper circle, amphitheatre, and gallery, are supported by iron columns; the sight lines have been carefully worked out, and every occupant of a seat in any part of the house has a clear and uninterrupted view of the stage. The ground floor is fitted up with new stalls and present pit—the seating having a good slope to the stage enabling everyone to be on equal terms with the one in front. The foyer, dress circle, and bar saloons are handsomely decorated and appointed, and placed well away from the auditorium. Ladies' and gentlemen's cloakroom and lavatory accommodation is ample to all parts. The stage is an unusuly large one, with large scene docks, property-rooms, property-maker's stores, and paint-room, all conveniently arranged. The block of dressing-rooms—which are at the side and detached from the stage—are well supplied with every necessary convenience. A complete installation of electric light has been erected. The decorations have been carried out in French Renaissance. The prevailing tints are cream, buff, and gold, relieved by rose-pink and smokey blues. The ceiling is a handsome one, the centre portion being domed and divided out with open scrolls, worked with bold cornices and enrichments. The proscenium opening is flanked on each side with an enriched frame from which spring ornamental bracketing. The whole of the work has been carried out under the personal supervision of the architect, ably assisted by Mr. S. King Sheldon and Mr. H. J. Worswick.

CHIPS.

Mr. Justice Darling will, on Monday next, open a free picture exhibition in Sayes Court Hall, Deptford. Promises of pictures have already been received from over twenty members of the Royal Academy. The Hon. W. F. D. Smith, M.P., is sending the famous portraits of Lord Beaconsfield and the Marquess of Salisbury, by the late Sir J. E. Millais.

There is a little Eutopia at Orsa, Sweden, where a community has sold about a million's worth of timber in a generation, and has in consequence no taxes to pay. By judicious planting they hope to realise as much income every thirty years. The railways, telegraphs, telephones, schools, and many other institutions are all free.

The Halifax Borough Engineer, Mr. E. R. S. Escott, last Friday communicated to the town council, by letter, that he had decided to resign his position. His health, he explained, was not satisfactory; and he thought that the present was a fitting opportunity to relinquish the office, seeing that the council were about to reorganise the engineering department. Mr. Sweet Escott has held the position for thirty years.

An inquiry was held yesterday week by Dr. G. St. George Mivart, at the Board School, Finstall, near Bromsgrove, respecting an application by the county council for power to borrow the sum of £10,000 to enable the Bromsgrove, Droitwich, and Redditch Hospital Committee to purchase a site at Hill Top, Bromsgrove, for the erection thereon of a permanent isolation hospital. Messrs. Hare and Lloyd, the architects of the proposed building, produced and explained the plans. The propose building will accommodate forty patients, with separate accommodation for scarlet fever, typhoid fever, and diphtheria cases, and for the division of the sexes. The building will comprise six blocks, including the administrative building, and there will be an isolation block, laundry, and disinfecting chamber, as well as accommodation for ten nurses. The drainage will be carried into the urban district council's sewer.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXV. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., and LXXV., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—L. L. and Co.—B. S. Co., Ltd.—R. T. P. Co. —J. L.—A. and A.—B. W. and Co.—R. F. W.— W. T. R. and Co.—S. S.—E. H. S.—M.—C. E.

A. J.—We will see soon.

T. M. (Kilburn).—Yes. Under the circumstances you are entitled to charge.

Builder.—We do not see what grievance you have against the quantity surveyor. Was it in the specification?

Countryman.—It is clearly no fault of your architect. Clergymen should really not interfere in this way. You wanted to be the whole building committee, the clerk of works, and everything else apparently, and the extras seem to us to be entirely of your own causing.

D. D.—Try Hall's sanitary washable distemper. It ought just to answer your purpose.

Rev. T.—Your architect is advising you rightly. Much better go to Hart, Son, Peard, and Co. The people you name are mere metal-work milliners.

Joiner.—The "Queen" circular saw-bench is the most simple and useful we know of. F. W. Reynolds and Co., Edward-street, Blackfriars-road, S.E.

Contractor.—We have never used it, and should not care to. We like Palmer's wire-supported travelling-cradle.

Borough Engineer.—Specifications should certainly always give the *name* of the manufacturer in the case of specialities; but we should understand by "Ruabon bricks" or "Ruabon terracotta" articles to be made and supplied by J. C. Edwards.

Ajax.—We do not know a book. If there is one, B. T. Batsford, 94, High Holborn, W.C., will be able to supply it. Write him.

James Ching.—Rivington's. You can get it at Batsford's; possibly second hand.

Playgoer.—The series of articles, 47 in number, on Theatres, by Ernest A. E. Woodrow, A.R.I.B.A., appeared in the issues of the Building News for the following dates (two or three copies of each are still obtainable):—July 15 and 29, Aug. 5, 12, and 19, Sept. 2, 16, 23, and 30, Oct. 21 and 28, Nov. 18, Dec. 2, 9, and 30, 1892; Jan. 27, Feb. 10, March 10 and 24, April 14, May 26, June 23, July 14, Aug. 4 and 18, Sept. 8, 22, and 29, Nov. 10, and Dec. 1 and 29, 1893; Jan. 19 and 26, Feb. 23, March 23, April 20, May 18, July 13, 20, and 27, Aug. 24, Sept. 28, Oct. 26, Nov. 9 and 23, and Dec. 7 and 28, 1894.

Intercommunication.

QUESTIONS.

[12286.]—**Professional.**—I should like the opinion of some of your readers of recognised standing in the following "hard case." There are four persons practising in our town as architects. One of the four keeps an assistant, and allows this assistant to carry on practice on his own account, said assistant having now at least a couple of "jobs" in progress. The hardship is perhaps increased by the fact of the principal having a land agency in the place, and Mr. Assistant being thus well "in the know" as to proposed building schemes. Is this fair to the other practitioners?—H. W.

[12287.]—**Dairy.**—Can any of your numerous readers inform me where I can get information as to the planning of a modern up-to-date dairy for a country mansion where about 30 cows are milked? The butter-making plant to be worked by an engine.—Enquirer.

REPLIES.

[12276.]—**Timber Measurement.**—I thought I gave names and addresses of publishers of books suggested. Have lost the reference. Think it was Richardson; but Batsford, 94, High Holborn, W.C., has a large stock, and may have it and others. Have no knowledge of price. If "Timber Merchant and Builder's Vade Mecum," by G. Bousfield, then it is published by W. Rider and Son, 14, Bartholomew-close, E.C. Price seems to be 4s.—Regent's Park.

[12278.]—**Gesso Decoration.**—According to Wm. Millar, author of an expert work on plastering, something can be seen at National Gallery by early artists; at Westminster Abbey (retable); Walter Crane has worked in it at Coombe Park.—Regent's Park.

[12280.]—**Electric Lighting Installation.**—Don't waste time over "easy guides" if you are an architect. Go to a respectable electric engineer like G. E. Cockburn, or Rashleigh Phipps and Co., and put the work in their hands. Don't employ cheap firms. I speak feelingly. I had a client not long since who wanted to be his own electrician. He was; and a happy time I had of it between him and the Electric Company. I shall never forget the astonishment of the latter when they found 8in. holes cut through solid stone landings to bring the mains through! "This is not a drainage job," said the company's foreman, and I agreed with him. I could not exactly say my client was a f—addist!—Chip.

[12280.]—**Electric Lighting Installation.**—I should recommend "Ajax" to read the articles in the Building News given some time ago, also the clauses in "Model Specifications." A useful little treatise is that of H. M. Leaf "The Internal Wiring of Buildings." It is better for the architect to make a separate contract for this work, or name an electric-lighting firm to do the work. Such London firms as Rashleigh Phipps and Co., 102, Oxford-street; Julius Sax and Co., 119, Coldharbour-lane, S.E.; and G. E. Cockburn, Great Pulteney-street, W., may be named. Obtain an estimate for the work to be done. There are many kinds and qualities of fittings, and a list of electric-light fitting makers is given in the "B. N." Directory. I do not think it desirable for the architect to take the risk and responsibility of the work under the contract unless he is an expert.—G. H. G.

[12282.]—**Fixing Ironwork in Stone.**—Use rolled sulphur, melted and poured in the holes. The "best" stone for a coping, of course, depends entirely upon locality.—Harry Hems.

[12284.]—**Fan for Ventilating Restaurant.**—Fans make a draught—*and* a noise; but really I don't think they effect ventilation—that is to say, the exchange of pure for foul air. I really prefer natural ventilation. I know it is difficult to get it in some underground places; but a specialist who really understands the matter would, I think, do it, and save you much money in the end.—Pyro.

[12284.]—**Fan for Ventilating Restaurant.**—Before "Interested" decides on using a fan, I should advise him to try one of Boyle's air-pump ventilators on the roof, or near the skylight, if there is one. These outlet ventilators form the best exhausts, and are noiseless. The rotating fan is noisy, and often creates a current of air without removing the effluvium. The fresh air is admitted through the entrance door of restaurant, generally open; or it may be brought in through a downcast shaft to the floor level, and then admitted through openings. The up-current created by the ventilators would effectually remove all unpleasant smell and vapour. —G. H. G.

[12285.]—**Keeping Rooms Cool.**—I daresay your idea would work, especially if asbestos or slag-wool or cotton-felting lining were used. Expanded metal would make a thin, strong partition. Boyles, Holborn Viaduct, make the most useful exhaust ventilator.—Regent's Park.

[12285.]—**Keeping Rooms Cool.**—Whitewashing would only be a temporary remedy, and by no means a very efficient one. A thin layer of felt is of little if any use; asbestos plastering is absolutely useless as a non-conductor of heat, cold, or sound, and an outside awning would doubtless be an inconvenient method. I would advise "Try" to write to the Silicate Cotton Co., Perrin-street, Kentish Town, for samples of their wares. I know of nothing which can touch silicate cotton as a non-conductor, and I have tried many substances. It has an additional advantage in being fireproof and imperishable.—J. C.

The Corporation electricity works at Halifax are to be extended by the addition of a building 100ft. long by 60ft. wide.

The old church at Whitkirk, which dates from the 13th century, will shortly undergo extensive alteration. Mr. Bodley has prepared plans showing improvements which include a new vestry and the extension of the chancel.

LEGAL INTELLIGENCE.

An Architect Charged with Obtaining Money by False Pretences.—Charles Evelyn Savery, 38, of Sutton-street, Hammersmith, described as an architect, and stated to be the author of several works on architecture, was charged, on remand, at Bow-street, on August 10, with obtaining £3 by false pretences from Mr. H. Douglas King, chief clerk to Messrs. H Sotheran and Co., booksellers, Strand. Mr. J. P. Grain defended the prisoner. On the last occasion it was stated that on July 21 the prisoner, who was known at the shop as a customer, came to Messrs. Sotheran's to cancel an order he had given for a book. At the same time he asked Mr. King to cash for him a cheque for £3 on the National Provincial Bank, and signed by him *per pro* his father. He was given the money, but the cheque, on presentation, was returned, marked "No account." Evidence was now given to show that there was at this bank a trust account established for the benefit of the prisoner's wife under her marriage settlement, the control being vested in four trustees, of whom the prisoner's father was one. Mr. Savery, sen., being very ill, the prisoner had been furnished with a power of attorney to sign for his father by procuration in drawing on this trust account, but his father had no private account at this bank, and the signature of more than one trustee was required on any cheque drawn on the trust account. The prisoner, who reserved his defence, was committed for trial on this charge. George Pollard, decorator, said that on July 29 he cashed a similar cheque for £2 for the prisoner, with whom he was acquainted. He passed the cheque to a publican, but it was dishonoured on presentation and he had to refund the money. It was proved that on July 25 the prisoner received a letter from the bank notifying him that, in consequence of his father's death, his authority to sign for him had become void. William Cleland, fruiterer, of Great Portland-street, also spoke to cashing a worthless cheque for £2 for the prisoner. Detective-sergeant Haines said there were other cases against the prisoner. Mr. Lushington committed the prisoner for trial on these two charges also, but offered to accept bail in two sureties in £25 or one in £50.

Warrington Builders in the Bankruptcy Court.—At the Warrington Bankruptcy Court last week, before Mr. Registrar Ridgway, Herbert Rowling Ezard, joiner and builder, Poulton-with-Fearnhead, appeared for his public examination. The statement of affairs showed the gross liabilities to be £30,101 16s. 4d., but creditors for £26,251 were fully secured, leaving the amount of the liabilities expected to rank £3,849 19s. 4d. The assets are estimated to produce £2,046 16s. 3d., leaving a deficiency of £1,803 3s. 1d. The causes of failure, as alleged by the bankrupt, are "Want of capital; over-building; failure to obtain further advances; loss of rent through want of tenants; heavy expense of filling up land at Ellesmere Port; and heavy law costs." Mr. Potter, the assistant official receiver, said he did not propose to take a public examination that day, because his questions would turn almost entirely on accounts, and he was going to ask the Court to make an order that the debtor file a cash account for the whole period of his trading. The debtor said he would be able to do this, and the examination was adjourned to Friday afternoon, September 1.—James Astley, builder, Long Lane, Longford, appeared for his public examination. The statement of affairs showed that there was a surplus of assets over liabilities of £96 7s. 11d. The cause of his failure was alleged to be the building of property on an insanitary site. The examination was closed.

A Speculative Builder's Troubles.—James Colenutt, of Studland Villa, Lee-on-the-Solent, builder, came up at the Portsmouth Bankruptcy Court last week for public examination. His assets were represented to be £595, of which £554 3s. was expected to rank for dividend. The assets were not expected to realise anything. The debtor's reason for his failure was that "I was insolvent when I left the Isle of Wight five years ago, and I have lost money by building on speculation at Lee-on-the Solent." The examination was adjourned until August 28th for a cash account for twelve months.

Cardiff Builders Bankrupt.—Messrs. Leonard Ernest Ivins and Thomas Andrews, builders and contractors, Portmanmoor-road, Cardiff, have filed their petition in consequence of a judgment obtained against them for £671, and the first meeting of creditors was held at the Official Receiver's Office at Cardiff on Wednesday week. In the unavoidable absence of Mr. George David, the Official Receiver, his deputy (Mr. J. A. Orr) presided. The statement showed that the gross liabilities were £30,577, but, according to the debtors' estimate, there is a surplus of assets amounting to £3,281. They commenced business in 1890 with a capital of £350 contributed equally, but from time to time they had added to that amount, and they now state that they have placed altogether between £400 and £500 in the business. With respect to the failure, the bankrupts state that they would be able to pay all their creditors in full if the properties could be realised. They have been unable to sell any property for over twelve months, and have lost a large sum in rents through the houses being vacant. Having only kept rent-books, they are unable to show their trading and financial position. The furniture in each case is claimed by the wife. Mr. C. E. Dovey was appointed trustee, with a committee of inspection.

Alleged Attempted Bribery of a L.C.C. Valuer.—At Bow-street on Saturday, before Mr. de Rutzen, William Henry Duncan, 69, mechanical engineer and estate agent, of The Parade, Churchfield-road, Acton, was charged, on remand, with unlawfully and corruptly offering a gift or reward to Edgar Josiah Harper, an officer and servant of the London County Council, as an inducement to do something in respect of a matter in which the said Council was concerned. Mr. Daldy, who appeared for the County Council, said that the prisoner was accused of offering a bribe to Mr. Harper, the assistant valuer to the Council, contrary to the Public Bodies' Corrupt Practices Act. Negotiations had been entered into, under the Housing of the Working Classes Act 1890, for the purchase of an estate of about 41 acres, known as Lynwood, at Tooting Graveney. The prisoner acted as agent for the proprietor, Mr. George Miller, in these negotiations, and, it appeared, was to receive a commission of 1 per cent. if he effected a sale. The prisoner asked £1,400 per acre for the estate, but Mr. Harper did not feel justified in offering more than £1,200 an acre, and it was in these circumstances that the prisoner, on July 6, offered Mr. Harper one-half of his own commission if he would, on the council's behalf, consent to the proposed price of £1,400 per acre, under which, he said, Mr. Miller would not go. Mr. Harper stated that on July 6 the prisoner came to see him at his office, his assistant, Mr. Hunt, being present in the room. The prisoner asked for a piece of paper, and on this being supplied to him, he wrote: "Mr. Miller has decided to accept £1,400 per acre, and has allowed me 1 per cent. commission, £200 of which I am willing to give to effect the sale of the property, which is worth £1,800 per acre," and handed the paper to witness without saying anything. Witness replied that a reduction of £200 on the purchase money was ridiculous, upon which the prisoner took back the paper, and wrote: "Will you consent to take half my commission, £270?" Witness replied, "£270 is no more good than £200"; upon which the prisoner took the paper a third time, and wrote: "Personally to take this." Witness replied that this put an end to the matter, and asked the prisoner to leave the room. Then the prisoner said that he had made a mistake, and begged to be forgiven. Witness asked him whether he was aware that he had committed a breach of the law, and he replied, "No, I was not. Forgive me, as we pray to be forgiven." Witness said that personally he forgave him, but as a servant of the Council he had a duty to perform. On Thursday last he received a letter from the prisoner, addressed from Holloway Prison, in which the prisoner complained bitterly of the action of the Council in imprisoning "an old man in his 70th year, on the verge of the spirit world, and who had never received one penny of their money." He continued, "They have locked up my body for three days and three nights in Holloway Prison, but my soul is free and ready to partake the joys of immortality." After stating that his time was spent in adding more stars to his eternal crown, he declared that a continuance of the imprisonment would result for him in insanity, warnings of which he had received already, and appealed to witness to withdraw the charge against him. Frank William Hunt, Mr. Harper's assistant, having confirmed the account of the interview of July 6, the prisoner, who reserved his defence, was committed for trial, bail being allowed as before.

* * *

The memorial-stone of a new Free Church was laid at Cullen, Banffshire, on the 10th inst. The church will be Gothic in style, and will cost about £2,300.

The foundation-stone of the new Protestant cathedral for Belfast will be laid on Wednesday, the 6th September, by the Countess of Shaftesbury. The architect is Mr. Thomas Drew, R.H.A., of Dublin, whose accepted design was illustrated in the Building News for October 30, 1896, and the contract for the first section of the work has been taken by Messrs. Laverty and Sons, of Belfast.

Mr. Wills, builder, attended before the Brixham District Council last week and complained of the new by-laws, which he thought would be the death-blow to the building trade of the town. The chairman said the council only wished to encourage good building, and that was the sole aim all through. They had been obliged to disapprove of the plans of 19 houses in Ranscombe for Messrs. Wills, Lockyer, and Bailey, and he believed they were justified in so doing. Eventually it was resolved that the committee should meet the builders on the spot.

Our Office Table.

A select party of the Society of Architects, comprising about forty ladies and gentlemen, visited the Canterbury Cathedral last Saturday week, and were conducted over the edifice. The first object of interest was the late Archbishop Benson's tomb in the north-western bay of the nave. The recumbent figure of Dr. Benson was pronounced by Mr. S. Trevail, a member of the party, an excellent likeness; but some features of the tomb, especially the black background to the tracery and armorial bearings, were considered to be too violent, and not so happy in conception as that of the tomb in the eastern part of the Cathedral, of which it is evidently a copy. Mr. Silvanus Trevail, the senior vice-president, in the absence of the president, proposed a vote of thanks to the reverend Canon for the treat he had afforded the party.

At the quarterly meeting of the Walsall Town Council last week, the General Purposes Committee recommended that the council approve of £55,000 being expended in erecting and furnishing a town-hall, comprising council chamber, with three committee-rooms, municipal offices for all departments except police, and a large public hall capable of seating 1,000 people; also that competitive plans be obtained and submitted to a special sub-committee, who should report thereupon. The Mayor proposed and Alderman Newman seconded this, neither making any statement. Mr. J. H. Roberts proposed as an amendment that the consideration of the question be deferred for six months. The amendment received only six votes, there being 20 against, and the committee's recommendation was approved by 21 votes to 5.

In the course of the demolition this week of St. George's Church, at the top of Lord-street, Liverpool, workmen have come upon a curious relic of the past. The church stands on the site of a baronial castle, first built by Roger de Poictiers in 1073. After being used for various purposes, the castle was demolished early last century to make room for the church. While at work last Tuesday the demolishers of the church came upon a large slab in the east aisle, immediately under the stained-glass window facing Lord-street. The slab being raised disclosed 12 steps cut in rock and leading to a platform, and an arched doorway led to another flight of five steps, at the foot of which was a square chamber about 14ft. in height, also cut in the rock. From this place there is a passage apparently running in the direction of the river, while marks on the walls suggested that the tide flowed in at high-water, though the church is on a high level and nearly 200 yards from the river. It is supposed that these steps and passages were hewn in the rock to provide an outlet from the castle near the waterside, and that when the castle was removed it was thought easier to cover the entrance than to fill up the passage. Foul air prevented the workmen from exploring further.

A great combination has, it is said, been effected among the wall-paper manufacturers, and the formation of this gigantic trust has been managed with such skill and secrecy that, we are told, "scarcely a syllable about it has crept into the newspapers." The machinery and business of the trust will be directed by a strong central board, and is already being worked, though it is not quite in full operation. One gentleman who writes is "afraid to mention the number of thousands of commercial travellers who are already thrown out of work by the creation of this trust." At present, we are told, the old firms will carry on business apparently as formerly, but in reality a purchaser going from house to house for a lower quotation will find a common scale of prices all round fixed by the central board or its committees, who are everywhere pulling the strings. We doubt very much if any really high-class house has joined the "trust." As for the rubbish, all the combinations in the world will find it difficult to lift the prices of that!

As the result of the first six months' working of the electric underground railway between Waterloo and the City, the company has been able to declare a dividend of 3 per cent., and to carry over a balance of £272. This is a thoroughly satisfactory beginning. The railway has carried a million and three-quarters of passengers, or a daily average of 12,000. The trains run at six minutes' interval during the busiest hours of the day, and when the new rolling stock which has been ordered is completed, they will be run still more frequently. There is no stopping place between the two termini, and the passengers and profits would have been enormously increased if there had been a half-way station at Blackfriars. This initial blunder of the promoters will, no doubt, be corrected some day.

A special meeting of the urban district council for North Walsham was held at the clerk's office on Friday last to consider certain correspondence with Messrs. Holmes and Sons with reference to their contract, and also a letter from Messrs. Cozens-Hardy and Jewson, which stated that they were instructed to say that Messrs. Holmes and Sons had every desire to honourably perform their contract and to carry out the work in a manner satisfactory to the council; but, however, the fact remained that in tendering and perusing the printed specifications, &c., the manager very naturally confined his attention to practical matters, and did not consider the very stringent clauses which are not usually inserted in the specification at all, but in a subsequent agreement, which is submitted to the contractor for approval, and they had informed their clients that the specification and contract were worded in such a way that they could advise no contractor to sign the same, the main point to which exception was taken being in regard to the power of the engineer, in respect of which the contract is framed in such a way as to give the engineer paramount powers, especially as regarded what were not extras and as to rejecting unsound or improper material. After a very short discussion, it was resolved to adhere to the terms and conditions of the contract which Messrs. Holmes and Sons had by their tender approved and agreed to, and that they be asked to at once enter into the contract in accordance with the undertaking contained in such tender. It was further resolved that Mr. Melliss be instructed by telegram to at once give Messrs. Holmes and Son formal notice under clause 159 of the general conditions to commence the works.

The *Exeter Evening Post* declares that the residents of Exeter may be divided into two camps: those who can tolerate Mr. Harry Hems and those who can't—or won't. "Why is it," asks our contemporary, "that Harry Hems is not the man he might be in the city of his adoption? In the first place, he has a marked indifference to what is a strong point with Exonians—dignity. This may be partially attributed to his travels, for, besides many journeys in Europe, he is well acquainted with North America, North and South Africa, and has met with adventure in Asia. The effect of these wanderings on a man of his temperament is to lower the market value of the formalities of life. He becomes what Kipling's sailor called the Marine—'A bloomin' cosmopolouse.' He doesn't see the necessity of the amount of ceremonial which is observed; and he says so. In another town Harry Hems would be a great man. The starch of a Cathedral city does not appeal to his nature; he is frequently knocking the stiffness out of it." So much the better for the stiffness, probably!

An inquiry was held last week at the King's Heath Institute, on behalf of the Local Government Board, by Mr. H. H. Law, into the proposal of the King's Norton and Northfield Urban District Council to borrow £1,150 for the purchase of land in the Pershore-road, King's Norton, as a site for public offices, fire station, and depot. Mr. A. W. Cross, surveyor to the district council, gave evidence in support of the application. Mr. Barrett, of Selly Oak, who said that he represented a certain working-men's society, protested that the offices should not be built at all, and that there were other matters calling for the attention of the authority—the supplying of wash-houses and baths, for instance. He did not see why the ratepayers should be asked to put their hands in their pockets to turn out about £10,000 to erect elaborate offices to serve as a cockpit for these gentlemen. Judging by the way the councillors were going on, they would want a boxing saloon soon. Mr. Brown having addressed the inspector in opposition to the application, and Mr. Pritchett having replied, the inquiry closed.

The question whether Cheltenham shall provide itself with suitable municipal offices, in which the various public departments shall be able to perform their work properly, has become a very pressing one. One scheme under discussion is for enlarging the accommodation at the present municipal offices—which are rented by the corporation—by adding to it the rooms used by some solicitors at an additional rental of necessity; the other is of acquiring a site and building premises at the public cost. The corporation are now paying £235 a year for the inadequate accommodation of the present offices, and this rental would be increased to £305 if the additional rooms are thrown in; while it is estimated that an outlay of something like £2,000 would be necessary to adapt those rooms to the requirements of the departments proposed to be housed in them. Assuming that sum were borrowed on the principle of redemption within 30 years, a further annual charge of £102 would be involved in capital and interest, and the total outgoings in respect of the improved municipal offices would thus be £407 per annum. As against this plan, it is argued that for very little more than the annual outlay, which in any event must be faced—viz., some £400 a year, the town can put itself in possession of buildings which would be a credit to its governing body and an ornament to one of its principal thoroughfares. A site could, it is thought, be obtained in a central position at a moderate cost, and for £10,000 or £12,000 a handsome building providing all the accommodation necessary and desirable could be erected. The council has appointed a committee to consider and report.

The distribution of certificates to the successful students at the summer term examination of the Crystal Palace Company's School of Practical Engineering took place on Friday in the lecture-room of the school at the Crystal Palace. Mr. Francis Fox, joint engineer of the Great Central Railway, presided, and there was a large attendance. Mr. J. W. Helps, who examined the mechanical section, reported upon the excellent methods adopted in the educational course. He was struck with the high merit of the work done in the pattern shops by several students, while both in the fitting shop and drawing office he saw much to prove considerable ability on the part of the students. Mr. A. de Saubergue, who examined the civil engineering department, reported that the answers in the *viva voce* examination were in most cases very good, the drawings were well executed, and the work done during the term showed that theory was not neglected for practical work. In his report in the electrical section, the examiner, Mr. Sherard Cowper Coles, stated that the dynamo work was particularly satisfactory. In the first year's course fifty students attended the lecture examination on "Railways: their Construction and Appliances," and of these thirty-seven passed, Mr. E. E. Homer being at the top of the list. The chairman distributed the certificates, presenting to Mr. Antinori a special award for gaining the largest number of certificates.

The annual report of Mr. Lyster, engineer to the Mersey Docks and Harbour Board, shows that the sand-pump dredgers G. B. Crow and Brancker have in the year just closed removed 2,190,000 tons of sand from the bar, 2,519,750 tons from the Queen's Channel, and 1,615,256 tons from Crosby Channel, making 6,325,000 tons in all. Since these operations began in September, 1890, 22,768,240 tons of sand have been removed from the bar, and 19,508,870 from the shoals in the above channels. The latest soundings over the whole dredged area show only two spots of 27ft., and a few of 28ft., while there is a line through the centre with no soundings of less depth than 29ft. at low water of spring tides.

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Colonel C. H. Luard, R.E., has held an inquiry into the application of the Kesteven C.C. for power to borrow £140,000 towards the cost of the erection of their new county lunatic asylum at Rauncebу, near Sleaford. We gave a block ground plan of the asylum, of which Mr. G. T. Hine, of Westminster, is the architect, in our issue of the 21st ult.

A petition has been filed in the York County-court by Samuel Wetherell, bricklayer, late of Wheldrake, and now of Holme-upon-Spalding Moor. A receiving order has been made, and debtor, upon his own application, adjudicated bankrupt.

The Alford Urban District Council have appointed Mr. Massie to carry out the bacteriological sewage scheme propounded by him for the Alford sewage.

Additions are being made to the boys' school at Westerham, Kent, from the designs of Mr. T. Potter, architect, Sevenoaks, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

Trade News.

WAGES MOVEMENTS.

Amalgamated Society of Carpenters and Joiners.—The report of this society for August states that on their invitation a conference was recently held between themselves, the two other national societies of joiners, and the Alliance Cabinet Makers, the Amalgamated Union, and the United Association of Scotland. The conference was called to establish an agreement, if possible, between the joiners and the cabinet-makers relative to the demarcation of work between the two sections of employés. The resolutions adopted by the joint representatives were as follow:—(1) "That this joint conference of the representatives of the cabinet makers and joiners' trade societies, after a prolonged discussion on the question of the constantly recurring friction between members of the respective societies on the various classes of work upon which they may be engaged, consider that the attempt to define what work should be done by the members of the respective societies is impossible. But in order to put an end to these deplorable disputes the only solution of the difficulty, in our opinion, is that in all cases where joinery or cabinet and house-furnishing firms tender for and obtain such work as ship, bar, bank, office, hotel, and the interior fittings of houses, the members of the respective societies working for such firms should on no account accept other than the highest rate of wages, and conform to the conditions and privileges that may be established by the unions engaged in the wood-working trades in that particular district." (2) "In the event of any dispute arising between the members of the carpenters and joiners and cabinet makers' trade societies who may be working together, if not settled locally, the matter in dispute shall be laid before the respective executive committees, the men to remain at work until investigation is made into the cause of the dispute. Further, the executive committees of the above societies pledge themselves to deal with such cases within seven days from the time notice of such has been brought to their attention. Investigations into the causes of complaint to be made on the spot if necessary." It has been agreed that these resolutions shall be submitted to the members of each society during the ensuing month. A resolution of the Openshaw branch of the carpenters and joiners' union has been carried as follows:—"That the time has arrived when a vote of our members should be taken on the question of Parliamentary representation, and that we levy ourselves for the support of the same." The voting for the secretaryship shows that 14,420 members of the union supported Mr. F. Chandler, the present occupant of the office, as against 441 who voted for Mr. L. Gascoigne, the other candidate.

The Skilled Labour Market.—The monthly memorandum prepared by the Labour Department states that the general state of employment during July was steady and good, the percentage of unemployed being lower than at any similar period since 1890. In the trade unions making returns it was 2·3 per cent., compared with 2·6 per cent. in July, 1898. There has been during the month a marked upward movement of wages, particularly among coal miners and iron and steel workers, and of the 51 fresh disputes occurring in July, only six affected the building trades. Employment in the building trades continued good. The percentage of unemployed union members, among carpenters and plumbers, at the end of July was 1·1, compared with 1·5 in June, and 1·0 per cent. in July of last year. In the furnishing trades employment was somewhat less brisk. The percentage of unemployed union members at the end of July was 1·9, compared with 0·9 in June, and 1·6 per cent. in July, 1898.

Yorkshire Bricklayers.—The suggestion made at the recent conference in London for adjusting the various disputes in the Yorkshire building trade is bearing fruit. On Bank Holiday a deputation from the Yorkshire Masters' Federation met representatives of the London Order of Bricklayers at the Queen's Hotel, Leeds, and after a protracted sitting framed between them a settlement of the differences that have divided the parties in Leeds. That settlement was ratified by the operatives on Saturday night, and it only now requires confirmation by the respective executives of the operatives and of the Employers' Federation. It embodies the following rules, which are to be added to the code already in force:—1. Bricklaying wages to be advanced from 9d. to 9½d. per hour. 2. That there be one apprentice to three bricklayers, and the limit to be six. That they be legally bound for not less than five years, their age to be not more than 16 years. 3. That no builder be allowed to take an apprentice before he has been in the business twelve months. 4. The apprentice rule to be considered provisional till the National Rules relating to apprentices have been settled. 5. That no strike or lock-out shall take place under any circumstances without the matter in dispute having been first brought before the Standing Committee, which shall, however, meet to discuss the matter within 48 hours' notice being given to the secretary, and the work in dispute shall remain in abeyance until such times as the Standing Committee have settled the matter. The Standing Committee to consist of seven employers and seven operatives. The terms of settlement proposed at the conference were submitted to a crowded meeting of the Leeds branch of the London Order of Bricklayers held at the Hope and Anchor Hotel, Call-lane, on Saturday night, when, on a ballot being taken, they were almost unanimously adopted. But the Leeds Master Builders' Association, at a meeting held on Tuesday at the Builders' Exchange in that city, under the presidency of Mr. W. Nicholson, declined to advance wages, and adjourned consideration of the apprentices question and that of the conciliation board for a week. It was intended that representatives of the Manchester Order of Bricklayers should meet the masters the same night, and an interview with delegates from the London Order of Bricklayers was also to have been held, but, in consequence of the masters not having accepted the recommendations submitted to them, these meetings did not take place. The adjourned conference between the master builders of Hull and the representatives of the building trades was held at the Builders' Exchange, Hull, on Tuesday night, but, like the last one, it proved abortive. The master builders declared that they would open their shops to those willing to work upon free labour principles. They did not object to the ½d. per hour advance to the joiners, to commence on Saturday, the 26th inst. If the operatives did not agree to this course, the masters would adhere to the resolution of the 14th inst. The men refused these terms, and left in a body. The masters then declared that they would open their shops to all men willing to work, and that they would stand by such men.

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WATER SUPPLY AND SANITARY MATTERS.

Rochdale.—At their last meeting the Rochdale Board of Guardians had an unpleasant surprise in Mr. Lynde's report on the sanitary condition of the workhouse premises. The report is an outcome of the work of a sub-committee appointed last May to consider the drainage of the workhouse. According to Mr. Lynde, the state of the institution is most unsatisfactory, mainly on account of defective drainage. "With the exception of a very small portion of the whole," Mr. Lynde says, "I am informed that the present drains are those originally laid when the buildings were erected; consequently it may be inferred that the premises never have been in a sanitary condition." He also stated that the drains of the recently-erected iron hospital or "annexe" are in a "very defective condition." The sub-committee recommended that Mr. Lynde be appointed to prepare plans and specifications for proposed alterations, with a view to obtaining tenders, and after some discussion this course was agreed to.

Morecambe. — The Local Government Board have at length given their sanction to the Morecambe sewerage scheme, which has been so long under their consideration. The Local Government Board inquiry into the application of the Council to borrow £60,000 for purposes of this scheme was held as far back as October 14 of last year, and at the time strong representations of special urgency were made to the commissioner, Colonel W. Langton Cooke. The outfall works, however, were at a point within the boundaries of the parish of Heysham, and the scheme has been subjected to strong opposition from that quarter. The scheme has now been sanctioned practically in the form in which it was submitted to the board. The amended estimate is for £62,500, £2,500 having been asked for since the inquiry, mainly on the recommendation of Colonel Cooke himself. The council have throughout been unanimous with respect to the scheme. The work is expected to take something like three years to complete. The new scheme, which was prepared by Mr. H. Bertram Nichols, C.E., of Birmingham, was accepted by the council as a result of an open competition in January of last year. A deputation of the council had previously visited Barking, Ealing, Exeter, and Oswestry, and had pronounced in favour of the septic system, which is the system followed by Mr. Nichols. The scheme is of a tripartite character, being intended to provide for a resident population of 15,000 in the winter, 25,000 in the spring and autumn, and 45,000 in the summer. The pumps and machinery will be arranged to work in three sets accordingly. There will be eight septic tanks, and a tidal culvert containing 800,000gal., where the sewage will be retained till an hour or more after high water, when it will be discharged into the bay at Seldom Seek on the Heysham foreshore.

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The Wesleyan Chapel, Formby, has been fitted with the latest improved hot-water heating apparatus by John King, Ltd., Engineers, Liverpool.

LIST OF COMPETITIONS OPEN.

Otley—Isolation Hospital	£30 (merged), £15	C V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Northfleet—Schools (750)	15gs.	Fredk. Mitchell, Clerk, 49, Windmill-street, Gravesend	,, 4
Dumfries—Public Library		John Grierson, Town Clerk, Dumfries	,, 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	,, 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	,, 16
Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	,, 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	,, 30
Parsonstown—Water Supply (6,000 population)		H. Barlow, Clerk, Town Hall, Parsonstown	—
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—

LIST OF TENDERS OPEN.

BUILDINGS.

Carlisle—New Wing, Whitefield Hall, nr. Bassenthwaite Lake		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	Aug. 19
New Ross—Enlargement of Board-Room	Guardians	P. A. Pope, Clerk, Board Room, New Ross, Ireland	,, 19
Caerphilly—Van Hotel		E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	,, 19
Great Yarmouth—Alterations to 28 and 29, Middle Market-rd.	Co-operative Society, Ltd.	The Stores, 43, Howard-street North, Great Yarmouth	,, 19
Wickham Market—Four Houses		J. Castell, Cycle Agent, Wickham Market, Suffolk	,, 19
Trowbridge—Cellars, &c., Union-street Brewery	J. H. and H. Blake, Ltd.	W. H. Stanley, A.M.I.C.E., Market House-chambers, Trowbridge.	,, 19
Churchtown—Additions to Taughboyne Rectory		A. M'C. Stewart, Architect, Shipquay-street, Londonderry	,, 19
Berwick-upon-Tweed—Houses, Ropery-lane	Robt. Aird	J. Lorimer Miller, Architect, 39, Hide Hill, Berwick-upon-Tweed	,, 19
Wakefield—Cellaring and Other Works at Eagle Brewery		S. Jackson and Son, Architects, Tanfield Chambers, Bradford	,, 19
Ashbourne—Union Offices, &c., Compton-street	Guardians	Naylor and Sale, Architects, Irongate, Derby	,, 19
Doncaster—Volunteer Drill Hall		J. E. Knight, Architect, 33, College-street, Rotherham	,, 19
Berwick-upon-Tweed—Printing Rooms, Offices, &c.	H. R. Smail	J. Lorimer Miller, Architect, 39, Hide Hill, Berwick-upon-Tweed	,, 19
Devizes—Work to Assize Courts		Charles S. Adye, County Surveyor, Stallard-street, Trowbridge	,, 19
Gorey—Additions to Workhouse	Guardians	R. Creighton, Clerk, Workhouse, Gorey, Ireland	,, 19
Buckfastleigh—New Wing at Hapstead House		Michelmore and Son, Gate House, Totnes	,, 19
Hertford—Factory	Gilbertson and Page, Ltd.	James Farley, Architect, Hertford	,, 21
Whitehaven—Alterations to Harbour Offices	Harbour Commissioners	J. Tyson, Clerk, Harbour Office, Queen's Dock Quay, Whitehaven	,, 21
Keighley—Two Blocks of Houses and Shops, Cavendish-street		John Judson and Moore, Architects, York Chambers, Keighley	,, 21
Amberley—Block of Workmen's Cottages	Pepper and Son	H. Howard, F.S.I., Architect, Town Offices, Littlehampton	,, 21
Huddersfield—Mistal at Wood Nook, Honley Moor	J. Roebuck	J. G. Wilson, Woodsome, Huddersfield	,, 21
Seaton Ross—Wesleyan Chapel		G. F. Danby, Architect, 10, Park-row, Leeds	,, 21
Rotherham—Repairs to Chapels at Cemetery	Cemeteries Committee	H. H. Hickmott, Town Clerk, Council Hall, Rotherham	,, 21
Bradfield—Boiler-House and Chimney Shaft at Workhouse	Guardians	Robert Simmons, Clerk, 4, Bridge-street, Caversham, Reading	,, 21
Thornes—Eleven Cottages, Thornes-lane		John Vaughan, Gaskell Villas, Thornes, Wakefield	,, 21
Leeds—Waiting-Room, &c., at Kirkstall Abbey	Corporation	Henry Walker, Architect, 8, Upper Fountain-street, Leeds	,, 21
Workington—Seamen's Bethel, Falcon-street	Seamens' Christian Friends' Soc.	W. G. Scott and Co., Architects, Victoria Buildings, Workington	,, 21
Enniskillen—Crown Post-Office		The Office of Public Works, Custom House, Dublin	,, 21
Mablethorpe—Four Houses and Out-Offices	Mablethorpe and Sutton Gas Co.	The Gas Company's Office, Mablethorpe, Lincs	,, 21
Bradford—Enlargement of Tyersal Mixed School	School Board	E. P. Peterson, F.S.A., Architect, 48, Sunbridge-road, Bradford	,, 21
Melbourne—Repewing Chapel		G. F. Danby, Architect, 10, Park-row, Leeds	,, 21
Whitehaven—Extension of Electric Lighting Stn., West Strand	Electricity Committee	The Borough Engineer, Town Hall, Whitehaven	,, 21
Glasgow—Stables at Garscube, Sawmillfield-street	Corporation	D. M'Coll, Superintendent, City Chmbrs., 64, Cochrane-st., Glasgow	,, 21
Cross Hills—House		Jno. Stirk, Architect, Horton-road, Bradford	,, 21
Fleetwood—Cloakroom, W.C.'s, and Boundary Wall	School Board	J. H. Kean, Solicitor, 6, Victoria-street, Fleetwood	,, 21
Southend-on-Sea—Technical Schools and Fire Brigade Station	Corporation	Wm. H. Snow, Town Clerk, Southend-on-Sea	,, 21
Earlsheaton—Three Residences		Charles Earnshaw, Granby Hall, Dewsbury	,, 22
Bishopston, Bristol—Baptist Church and Classrooms	Building Committee	R. Milverton Drake & J. Pizey, Architects, Baldwin-street, Bristol	,, 22
Bristol—All Hallows' Church, Easton		George H. Oatley, Architect, Edinburgh Chambers, Bristol	,, 22
Glasgow—Warehouses in Trongate, King, and Parnie-streets	Corporation	John M'Kissack and Son, Architects, 68, West Regent-st., Glasgow	,, 22
Reading—New Synagogue and Communal Buildings	Hebrew Congregation	J. Lewton, Architect, 6, Forbury, Reading	,, 22
Cockfield—Alterations to Lowe Bank, Esperley-lane		W. Parkin, Surveyor, Barnard Castle	,, 22
Londonderry—Platform Shed at Terminal Station	Donegal Railway Co.	James Barton, Engineer, Exchange Buildings, Dundalk	,, 23
Cardenden—School	Auchterderran School Board	Lyle and Constable, Architects, 3, Hill-street, Edinburgh	,, 23
Rawmarsh—Shops and Houses, High-street	Walter Willey	J. Platts, Old Bank Buildings, High-street, Rotherham	,, 23
Bishop Auckland—Rebuilding Green Tree Inn		F. H. Livesey, Architect, Newgate-street, Bishop Auckland	,, 23
Dowlais—Block of Offices	Iron Co.	E. A. Johnson, F.R.I.B.A., Architect, Merthyr	,, 23
Coldstream, N.B.—Additions to North School	School Board	Melrose and Porteous, Coldstream, N.B.	,, 23
Fulham-road, S.W.—Works to Chimney Shaft at Workhouse	St. George's Union Guardians	Edwin T. Hall, F.R.I.B.A., 57, Moorgate-street, E.C.	,, 23
Clayton-le-Moors—Thirteen Houses, Adelaide-street	Co-operative Society, Ltd.	J. W. Cooper, Secretary, Clayton-le-Moors, Lancs	,, 23
Swaffham—Girls' School		Milne and Hall, Architects, 77, Chancery-lane, W.C.	,, 24
Rotherham—Converting Premises into Shops, &c.	General Purposes & Parks Com.	J. Platts, Architect, High-street, Rotherham	,, 24
Portsmouth—Wesley Central Hall		J. Jameson Green, Architect, South John-street, Portsmouth	,, 24
Halifax—Refreshment House, Gibbet-lane		Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	,, 24
Rotherham—Remodelling Mechanics' Hall	General Purposes & Parks Com.	J. Platts, Architect, High-street, Rotherham	,, 24
Dewsbury—Enlargement of Broomfield House		F. W. Ridgway, F.R.I.B.A., Architect, Dewsbury	,, 24
Shoeburyness—House and Shop		W. Y. Hobbiss, Architect, 57, High-street, Southend	,, 25
Celbridge—Cottages	Rural District Council	Francis Shortt, Clerk, Celbridge, Ireland	,, 25
Shoreham—Wesleyan Church and Schools		Gordon, Lowther, and Gunton, Archts., Blomfield-st., London, E.C.	,, 25
Pontefract—Three Houses and Shop, Monkhill-lane	John Robinson	Chas Keyworth, Architect, Bank Chambers, Pontefract	,, 26
Illogan, Cornwall—Reseating and Renovating Wesley Chapel		Sampson Hill, Architect, Green-lane, Redruth	,, 26
Chartham—Caretaker's House at Cemetery	Parish Council	Andrew Bromley, Architect, The Cathedral Precincts, Canterbury	,, 26
Okehampton—Post-Office, Fore-street		J. Archibald Lucas, Surveyor, Okehampton	,, 26
Luton—Police Station	Bedfordshire County Council	The County Surveyor, Shire Hall, Bedford	,, 26
North Devon—Hotel at Wooda Bay Station		G. C. Smyth-Richards, Surveyor, Barnstaple	,, 26
Chesterfield—Board Schools and Swimming-Bath	School Board	Tiltman and Jackson, Archts., 29, Knifesmith Gate, Chesterfield	,, 28
Godalming—Municipal Buildings	Town Council	Lanchester, Stewart, and Rickards, Archts., 1, Vernon-pl., London	,, 28
Ashford—Pumping Station and Cottage	Rural District Council	Bailey-Denton, Son, & Lawford, MM.I.C.E., 9, Bridge-st., Westmnstr	,, 28
Halifax—Extension of Engine-Room, &c.	Borough Council	W. H. D. Horsfall, F.I.A.S., Tower Chambers, Silver-st., Halifax	,, 28
Morley—Offices, Stores, Engine House, Boundary Walls, &c.	Sewage Purification Committee	W. E. Putman, A.M.I.C.E., Borough Engineer, Morley	,, 30
Malvern—Sanatorium	Urban District Council	The Surveyor's Office, Malvern	,, 30
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	,, 31
Monaghan—Enlarging Presbyterian Church		Forster Dunwoody, J.P., Monaghan	,, 31
Linthorpe—Eleven Pairs Semi-Detached Villas, Phillips-avenue		Arthur F. Newsome, M.S.A., Architect, Albert-road, Middlesbrough	,, 31
Manchester—Storage Warehouse, &c., Poland-street	Corporation	Joseph Swarbrick, Architect, 33, Brazennose-street, Manchester	,, 31
Leeds—Congregational Sunday-School, Woodsley-road		G. F. Danby, Architect, 10, Park-row, Leeds	,, 31
Irvine—Academy	School Board	John Armour, jun., Architect, Irvine, Scotland	Sept. 1
Bristol—Offices, Broad-street	Corporation	T. H. Yabbicom, M.I.C.E., 63, Queen-square, Bristol	,, 1
Malmo—Electricity Works		The Gasworks Directors, Malmo, Sweden	,, 1
St. Albans—Additions to Premises, Victoria-street	Corporation	The City Surveyor's Office, St. Albans	,, 1
Hellingly, Sussex—Foundation Works for Asylum	Visiting Committee	G. T. Hine, F.R.I.B.A., 35, Parliament-street, Westminster, S.W.	,, 4
Enfield—Schools, Chase Side	School Board	G. E. T. Laurence, 181, Queen Victoria-street, E.C.	,, 5
Ballycrovane—Coastguard Station		The Carpenter-in-Charge, Queen's College, Cork	,, 7
Devonport—Buildings for Working Classes	Town Council	John F. Burns, Borough Surveyor, 30, Ker-street, Devonport	,, 7
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	,, 12
Carlisle—New Vicarage, Irthington		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	,, 18
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	,, 30
North Ormesby—Wesleyan Schools	The Trustees	Robt. Moore, Architect 27, Albert-road, Middlesbrough	—
Featherstone—Two Villa Residences		Garside and Pennington, Architects, Pontefract	—
Waterford—Repairs to Premises, Bailey's New-street	Holy Ghost Hospital	R. H. Kelly, 21, The Mall, Waterford	—
Friern Barnet—Enlarging St. Peter's Schools, Sidney-road		Alfred Cox, Architect, 37, Baker-street, Portman-square, W.	—
Purston—House and Shop		Garside and Pennington, Architects, Pontefract	—
Carlisle—Additions to Houghton House	H. Brooks Broadhurst, J.P.	Oliver and Dodgshun, Architects, 5, Lowther-street, Carlisle	—
Plaistow—Thirty Cottages, Alnwick-road, Custom House		H. I. Cundy, 91, The Grove, Stratford, E.	—
Ashington—Stores, Seaton Hirst	Newbiggin and District Co-op. Soc.	Boolds and Hardy, Architects, Morpeth	—
Shipham—Repairs to Church		E. Buckle, Architect, 23, Bedford-row, London, W.C.	—
Bury, Lancs—Additions to the Egyptian Mills	E. D. Milnes	C. H. Openshaw, Architect, Fleet-street, Bury	—
Liscard—Welsh Congregational Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Fermanagh—Pump-House, &c., at Portora Royal School	Board of Education	Thomas Elliott, Architect, Enniskillen	—

BUILDINGS—*continued.*

Barrow, Lancs—Reslating Eleven Houses, Drake-street		E. Basil Lupton, 14, East-parade, Leeds	—
Whitby—Four Villas, West Cliff Estate	Capts. Ebblewhite and R. D. Foster	Henry Walker, West Cliff Estate Office, Whitby	—
Pontefract—Alterations to Premises		Garside and Pennington, Architects, Pontefract	—
Saltley—Theatre	A. Carlton	Thos. Guest, Architect, Corporation-street, Birmingham	—
Billingham—House near Haverton Hill Church		Mrs. Booth, South View, Billingham	—
Middleton—Chapel and Schools	Wesleyan Chapel Trustees	E. Wood, A.R.I.B.A., Architect, 78, Cross-street, Manchester	—
West Kensington—Plastering Work		W. Smith, Builder, 67, Denmark Hill, Camberwell, S.E.	—
Colwyn Bay—Steam Laundry, Llanelian-road	Steam Laundry Co, Ltd.	Taylor and Burgess, A.R.I.B.A., Architects, Longton	—
Lismore—Improvements in Chancel of Cathedral		The Deanery, Lismore	—
Sheffield—Alterations to Shops at Moorhead	T. Hill	J. P. Earle, Architect, Norfolk-row, Sheffield	—
Colbren—Repairing Cottages		J. F. Bell, Manager, Drym Colliery, Onllwn, Neath, and Brecon Ry.	—
King's Lynn—Gallery in Music Hall	Forward Association	William Jarvis, Architect, Market Square, King's Lynn	—
Swanscombe—Concrete and Brick Work		J. B. White and Bros., Limited, Swanscombe, Kent	—
Dewsbury—Rebuilding Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	Fred. W. Ridgway, F.R.I.B.A., Archt., Boro' Chambers, Dewsbury	—
Cradley—Baptist Church		H. T. Butler, Architect, Cradley Heath	—
New Bilton—Additions to Schools	Managers	J. Ace Beynon, M.S.A., Architect, Frome, Somerset	—
Uxbridge—Business Premises, Vine-street	Randall Bros.	William L. Eves, Architect, 54, High-street, Uxbridge	—
Sutton-in-Ashfield—Staging, &c., in Town Hall		The Co-operative Society, Mount-street, Sutton-in-Ashfield	—
Dewsbury—Restoration of Dewsbury Moor Schools	School Board	Fred. W. Ridgway, F.R.I.B.A., Archt., Boro' Chambers, Dewsbury	—
Hucknall Torkard—Two Villas and Four Cottages	Samuel Coupe	Frederick Gratian, Architect, Hucknall	—
Tonna—Incline at Wenallt Collliery		38, St. Anne's Terrace, Tonna, Neath	—
Swansea—Premises on the Strand	Cambria Cold Storage and Ice, Ltd.	T. Hurlington Jones, Secretary, Bank Chambers, Swansea	—
Halton—House		Albert E. Dixon, A.R.I.B.A., Architect, 5, Park-lane, Leeds	—
Darwen—Grand Stand at Anchor Ground	Football Club	John B. Thornley, Architect, 45, Market-street, Darwen	—
Cumberland—Cutting Foundations at Clifton Colliery		J. Gilchrist, Clifton Lodge, near Workington	—
Senghenith—Business Premises, Commercial-square	J. Jones and J. Morgan	E. H. Bruton, F.R.I.B.A., Architect, 15, Queen-street, Cardiff	—
Widdrington—Alterations to Co-operative Society's Premises		James Haigh, Widdrington Colliery Office, Widdrington	—
Essington—Artisan's Dwellings		John Weller and Sons, Architects, Wolverhampton	—
Thornton Heath—Chapel, Parchmore-road	Wesleyan Chapel Trustees	Frederick W. Ledger, Architect, 8, Philpot-lane, E.C.	—
Leeds—Taking Down Part of 88 and 90, North-street		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Romiley—Alterations to Grey Horse Inn		Burton and Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Whaley Bridge—Eight Houses	Co-operative Society	C. W. Johnson, Architect, Whaley Bridge	—
Flookburgh—Shop and House		J. Slater, Flookburgh, Lancs	—
Tunbridge Wells—House		J. F. Bull, Surveyor, 30, Bedford Row, London, W.C.	—
Maidstone—Mills	W. J. Mackey	Hubert Bensted, Architect, Maidstone	—
Grays, Essex—Alterations to Co-operative Stores		Christopher M. Shiner, A.R.I.B.A., 3, Bond-court, Walbrook, E.C.	—
Dewsbury—Rebuilding Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Littleborough—New Works	Phœnix Ironworks Co.	F. H. Shuttleworth, Archirect, Littleborough	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Selby—Alteration of Premises	Yorkshire Banking Co., Ltd.	James Young and Co., Architects, 62, Market-street, Bradford	—
Leeds—Alterations to General Infirmary		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Dewsbury—Restoration of Schools	School Board	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—

ENGINEERING.

Bury—Lattice Bridge at Clough Bottom Reservoir	Waterworks Committee	J. Cartwright, M.I.C.E., Borough Engineer, Bury, Lancs	Aug. 19
Glasgow—Steamboat Slip at Loch Katrine	Corporation	James M. Gale, Engineeer, 45, John-street, Glasgow	„ 19
Cockermouth—Bridge over Far Stock Beck, Dean	Rural District Council	J. B. Wilson, A.M.I.C.E., Court Buildings, Cockermouth	„ 19
Adlington—Sludge Works	Urban District Council	Theo. S. McCallum, A M.I.C.E, 52, Corporation-street, Manchester	„ 19
Glasgow—Switchboards and Instruments	Corporation	W. A. Chaman, Engineer, 75, Waterloo-street, Glasgow	„ 21
Blackpool—Electrical Equipment of Tramcars	Corporation	Robert C. Quin, M.I.E.E., Electricity Works, Blackpool	„ 21
Queenstown—Waterworks	Urban District Council	The Urban District Council Offices, Town Hall, Queenstown	„ 21
Castlecomer—Waterworks	Rural District Council	Thomas Mahoney, Clerk, Castlecomer, Ireland	„ 21
Winton—Hydrants, &c.	Urban District Council	W. Turner Streather, Surveyor, Winton, Bournemouth	„ 21
Bailieborough—Sinking Well in Market-square, Kings-court	Rural District Council	Thomas Daniel, Architect, Bailieborough	„ 21
Glasgow—Electricity Meters	Corporation	W. A. Chaman, Engineer, 75, Waterloo-street, Glasgow	„ 21
Bristol—Filter Beds, &c., at Barrow Gurney	Bristol Waterworks Co.	Taylor, Sons, & Santo Crimp, C.E.'s, 27, Gt. George-st., Westminster	„ 21
Colwyn Bay—Boiler, Pumps, Tank, &c.	Urban District Council	William Jones, A.M.I.C.E., Council Offices, Colwyn Bay	„ 22
Sophia—Passenger Cars and Goods Waggons	Bulgarian State Railways	The Commercial Dept. of the Foreign Office, Downing-st., S.W.	„ 22
Cockermouth—Steam Cooking Apparatus at Flimby Lodge	Guardians	I. Irving, Flimby Lodge, Cockermouth	„ 22
Colwyn Bay—Steam Dynamo (60kw.)	Urban District Council	William Jones, A.M.I.C.E., Council Offices, Colwyn Bay	„ 22
Portsmouth—Ventilating Shafts	Corporation	Alex. Hellard, Town Clerk, Town Hall, Portsmouth	„ 22
Colwyn Bay—Switchboard, Accumulators, and Street Cables	Urban District Council	William Jones, A.M I.C.E., Council Offices, Colwyn Bay	„ 22
Morley—Driving a Heading under Embankment	Gas Committee	W. E. Putman, A.M.I.C.E., Borough Engineer, Town Hall, Morley	„ 23
Berkhampstead—Filter Beds	Joint Sewerage Committee	James Lemon, M.I.C.E., 9, Victoria-street, Westminster	„ 23
Cilgerran—Bridge at Cwmplysgog	St. Dogmells Rural District Council	John Evans, District Surveyor, Tyhen, Rhoshill, R.S.O.	„ 23
Dundee—Electric Tramway Plant	Town Council	Walter H. Tittensor, Engineer, Dudhope-crescent-road, Dundee	„ 23
Craigellachie—Cutting Track & Laying C.I. Pipe (1,422 yards)		J. Keir, Secretary, Water Committee, Craigellachie	„ 23
Manchester—Installations for Electric Lighting of Baths	Baths Committee	The General Superintendent, Osborne-street Baths, Manchester	„ 23
Belfast—Water Main (1 mile 66 chains)	City & District Water Commissionrs	Acheson Ferguson, Quantity Surveyor, 4, Wellington-place, Belfast	„ 24
Christchurch—Water Tower at Milton (200,000gal.)	West Hampshire Waterworks Co.	R St. George Moore, M.I.C.E., 17, Victoria-street, Westminster	„ 24
Salisbury—Iron Balconies and Staircases at Infirmary Wards	Guardians	John Harding and Son, Architects, 58, High-street, Salisbury	„ 24
Belfast—Two Filtering Reservoirs at Oldpark	City & District Water Commissionrs	Acheson Ferguson, Quantity Surveyor, 4, Wellington-place, Belfast	„ 24
Plymouth—Deep-Sea Outfall Sewer	Corporation	James Mansergh, C.E., 5, Victoria-street, Westminster	„ 24
Castleford—Water-Main Laying	Urban District Council	W. Green, Surveyor, Council Offices, Carlton-street, Castleford	„ 24
Pentre—Gas Mains at Penycraig, Ton, and Gelli	Rhondda Urban District Council	O. Thomas, Engineer, Gas & Water Offices, Pentre, R.S.O., Glam	„ 25
Carlisle—Bridge Works	Rural District Council	George Armstrong, Architect, &c., 24, Bank-street, Carlisle	„ 25
Blackpool—Fire Hydrant Service, Town Hall	Corporation	Potts, Son, and Pickup, Architects, St. Georges-road, Bolton	„ 26
Ashford, Kent—Rising Main, &c.	Rural District Council	Bailey-Denton, Son, & Lawford, MM.I.C.E., 9, Bridge-st., Westmstr	„ 28
Westbury-upon-Trym—Sewage Disposal Works	Barton Regis R.D.C.	A. P. I. Cotterell, A.M.I.C.E., 7, Baldwin-street, Bristol	„ 28
Perth—Electric Lighting Plant	Lord Provost and Commissioners	W. C. C. Hawtayne, M.I.E.E., 9, Queen-street-place, London, E.C.	„ 28
Monmouth—Flood Gates, &c., at Old Forge	Corporation	The Engineer, Generating Station, Monmouth	„ 28
Brighton—Excavating Trenches for Electric Light Cables	Town Council	Francis J. Tillstone, Town Clerk, Town Hall, Brighton	„ 28
Ashford—Engines and Pumps	Rural District Council	Bailey-Denton, Son, & Lawford, MM.I.C.E., 9, Bridge-st., Westmnstr	„ 28
Meare—Sinking Borehole on Godney Hill	Wells Rural District Council	A. P. I. Cotterell, Engineer, Bristol	„ 29
Sophia—Locomotives	Bulgarian State Railways	The Commercial Dept. of the Foreign Office, Downing-st., S.W.	„ 30
London—Workshop Machines	East Indian Railway Co.	A. P. Dunstan, Secretary, Nicholas-lane, London, E.C.	„ 30
Enfield—Screw-Cutting Lathe & Shaping & Drilling Machines.	Urban District Council	T. W. Scott, Clerk, Court House, Enfield	„ 30
Westbury—Service Reservoir, Pumping Station, Well, &c.	Westbury & Whorwellsdown R.D.C.	W. H. Stanley, A.M.I.C.E., Market House Chambers, Trowbridge	„ 30
Leeds—Electric Lighting of Car Sheds, Kirkstall-road	Tramway Committee	T. Hewson, M.I.C.E., City Engineer, Municipal Buildings, Leeds	„ 30
Battersea, S.W.—Batteries, &c.	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Edinburgh—Electric Lighting Gear, &c.	Magistrates and Council	Prof. A. B. W. Kennedy, 17, Victoria-street, Westminster	„ 31
Devonport—Electric Tramways (4½ miles)	Tramways Company	C. Chadwell, Engineer, Richmond Chambers, Blackburn	„ 31
Battersea, S.W.—Overhead Travelling Crane, &c.	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Newcastle-upon-Tyne—Boiler Plant	New Tramways Committee	Charles Hopkinson, M.I.C.E., 29, Princess-street, Manchester	„ 31
Battersea, S.W.—Electric-Lighting Works	St. Mary's Vestry	M. Wilkins, Clerk, Municipal Buildings, Lavender Hill, S.W.	„ 31
Carmarthen—Reservoir (17,000,000gal.)	Corporation	The Borough Surveyor, Carmarthen	Sept. 2
Belfast—Widening Spencer Dock Entrance	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast	„ 4
Waterloo, Lancs—Laying Tramway Track	Urban District Council	F. Spencer Yates, A.M.I.C.E., Surveyor, Town Hall, Waterloo	„ 6
East Ham—Electric Light and Traction Plant	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	„ 9
East Ham—Water-Tube Boilers, Condensers, Purifiers, &c.	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	„ 9
East Ham—Electric-Lighting Cable	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	„ 9
Preston—Bridge over River Darwen	Lancashire County Council	W. Harold Radford, Bridgemaster, County Offices, Preston	„ 11
Hackney—Dynamos	Vestry	Robert Hammond, M.I.C.E., 64, Victoria-street, Westminster	„ 12
Southport—Tramways	Corporation	R. P. Hirst, Borough Engineer, Southport	„ 12
Woodford to Ilford—Railway	Great Eastern Railway Co.	The Engineer, Liverpool-street Station, London, E.C.	„ 13
Leyton—Pumps, &c.	Urban District Council	F. Harman Lewis, Engineer, Cathall-road, Leytonstone	„ 14
Birmingham—Service Reservoir and Laying Pipes	Corporation	James Mansergh, Engineer, 5, Victoria-street, Westminster	„ 14
Leyton—Overhead Travelling Cranes (8-ton and ½-ton)	Urban District Council	F. Harman Lewis, Engineer, Cathall-road, Leytonstone	„ 14
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	Nov. 3
Bradford—Excavating (2,000 cube yards)		John Jackson, Architect, Barry-street, Bradford	—
Kendal—Dynamos, Batteries, and Street Wiring	Ingleton Elec. Light and Power Co.	G. Gilkes and Co., Canal Ironworks, Kendal	—
Kirk Bramwith—Hot-Water Apparatus for Church		The Kirk Bramwith Rectory, Doncaster	—
Blackpool—Electric Fittings at Masonic Hall, Adelaide-street		T. Sankey, 93, Adelaide-street, Blackpool	—
Durham—Sinking Two Shafts near Seaham Harbour		The Colliery Offices, Durham	—

FENCING AND WALLS.

Southport—Wrought-Iron Unclimbable Fence Railing (509 yds)	Corporation	R. P. Hirst, Borough Surveyor, Southport	Aug. 21
Letterkenny—Repairing Wall round Graveyard	Rural District Council	R. S. Watters, Clerk, Workhouse, Letterkenny	„ 31

FURNITURE AND FITTINGS.

Bury—Fittings to Shop Premises, Hornby-street	District Co-op. Provision Soc., Ltd.	D. Hardman, Architect, Silver-street, Bury	Aug. 21
Brighton—Roller Blinds to Windows of Workhouse	Guardians	B. Burfield, Clerk, Parochial Offices, Prince's-street, Brighton	„ 22
Whittingham—Tables (28), Wooden Seats (24), Couches (20)		The Asylum, Whittingham, Preston	„ 28

FURNITURE AND FITTINGS—*continued.*

Rochdale—Bentwood Chairs (250) for Town Hall	General Purposes Committee	The Borough Surveyor's Office, Town Hall, Rochdale	Aug. 29
London—Bedsteads, Chairs, Tables, &c.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk House, Norfolk-street, W.C.	„ 29
Swansea—Oak Furniture for Board-room	Guardians	The Architect's Offices, 42, Castle Bailey-street, Swansea	„ 30

PAINTING.

Wolverhampton—Electric Light Station, Commercial-road	Lighting Committee	J. W. Bradley, A.M.I.C.E., Boro' Eng., Town Hall, Wolverhampton	Aug. 19
Macroom—Workhouse R.C. Church	Guardians	J. T. Murphy, Clerk, Macroom, Ireland	„ 19
Portsmouth—Decorating Town Hall		Alexander Hellard, Town Clerk, Town Hall, Portsmouth	„ 21
Rotherham—Chapels, Cottages, and Greenhouses at Cemetery	Cemeteries Committee	H. H. Hickmott, Town Clerk, Council Hall, Rotherham	„ 21
Glasgow—Stables at Garscube	Corporation	D. M'Doll, City Chambers, 64, Cochrane-street, Glasgow	„ 21
Nantymoel—Bethel Independent Chapel		H. B. Davies, Secretary, 12, Commercial-street, Nantymoel	„ 21
Belfast—Shelter in Cemetery	Cemetery Committee	Sir Samuel Black, Town Clerk, Belfast	„ 22
Whitworth—Mill and Weaving Sheds		The Whitworth Manufacturing Co., Ltd., Whitworth, nr. Rochdale	„ 22
Glasgow—Warehouses	Corporation	J. M'Kissack and Son, Architects, 68, West Regent-street, Glasgow	„ 22
Newton Abbot—Buildings at Newton College		William Rowell, Architect, Newton Abbot	„ 24
St. Pancras, N.W.—Baths and Washhouses, Whitfield-street	Vestry	C. H. F. Barrett, Clerk, Vestry Hall, Pancras-road, N.W.	„ 25
Pontefract—Three Houses and Shop, Monkhill-lane	J. Robinson	Chas. Keyworth, Architect, Bank Chambers, Pontefract	„ 26
Stanley—Primitive Methodist Chapel		Wm. Forster, Architect, Clifford-road, Stanley, R.S.O.	„ 26
Burnley—Pig Market and Slaughter-Houses, &c.		William Waddington, Market Superintendent, Burnley	„ 29
Leeds—Sunday School, Woodsley-road		G. F. Danby, Architect, 10, Park-row, Leeds	„ 31
Ulverston—External Wood and Iron Work at Cemetery	Urban District Council	James Atkinson, Theatre-street, Ulverston	„ 31
Dartford, Kent—Darenth Asylum	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk House, Norfolk-street, W.C.	Sept. 4
Kirkstall—Eight Villas, Vesper-road		Whitaker and Sons, Ltd., Horsforth	—
Facit, Lancs—Fourteen Cottages and Four Shops		Abel Stott, 15, Market-street, Leavengreave	—
Woodside—Eighteen Houses, Hawksworth-road		Whitaker and Sons, Ltd., Horsforth	—

PLUMBING AND GLAZING.

Shillelagh—Glazed Piping to carry Overflow, &c., at Carnew	Rural District Council	J. Hopkins, Clerk, Shillelagh, Ireland	Aug. 19
Blackburn—Reconstruction of Fifty Privies and Cesspools	Health Committee	Wm. Stubbs, M.I.C.E., Municipal Offices, Blackburn	„ 24
Hucknall Torkard—Alterations to Closets, &c., Spring-st. Schools	School Board	A. N. Bromley, Architect, Prudential Buildings, Nottingham	—

ROADS AND STREETS.

Dronfield—Asphalting Yards, &c., at School	School Board	W. J. Siddall, Architect, Hope-terrace, Dronfield	Aug. 19
Antrim—Repairs to Roads, &c.	Rural District Council	J. Clark, Clerk, Union Office, Antrim	„ 19
Bilton—Forming Footpath behind Limekiln Wood	Parish Council	T. Hindell, Clerk, 13, Market-place, Harrogate	„ 19
Cockermouth—Repair of Roads in the Parish of Whinfell	Rural District Council	J. B. Wilson, A.M.I.C.E., Court Buildings, Cockermouth	„ 21
Ravensthorpe—Making, Forming, and Draining Street		C. H. Marriott and Son, Architects, West Park-street, Dewsbury	„ 21
Cardiff—Roads and Sewers	Glamorgan County Governing Body	E. David and David, 27, High-street, Cardiff	„ 21
Guisborough—Street Works	Urban District Council	B. Dunning, Surveyor, Fountain-street, Guisborough	„ 22
Blackpool—Street Works	Corporation	J. Wolstenholme, Boro. Eng., St. John's Market Bldngs, Blackpool	„ 22
Royston—Kerbing, Channelling, Paving, &c., Footpaths	Hertfordshire County Council	The County Surveyor's Offices, 41, Parliament-st., Westminster, S.W.	„ 23
Barrow-in-Furness—Construction of Stanley-road	Corporation	The Borough Engineer, Town Hall, Barrow-in-Furness	„ 23
Heaton Moor—Making-up and Completing Tatton-road South	Urban District Council	J. Green Banks, Clerk, 79, Heaton Moor-road, Lancs	„ 24
Hurstpierpoint—Roadmaking and Draining on New Cemetery	Parish Council	H. W. Beach, Perrymount, Haywards Heath	„ 24
Lees, Lancs—Street Works	Urban District Council	Blackburn, Page, and West, 54, Union-street, Oldham	„ 25
Blandford—Road-Making on Damory Court Estate		C. Hunt, Architect, Blandford	„ 25
Devonport—Paving Portion of James-street	Town Council	John F. Burns, Borough Surveyor, Ker-street, Devonport	„ 26
Glenties—Road Repairs	Rural District Council	Alexander Hill, Clerk, Board-room, Glenties, Ireland	„ 26
Sandal Magna—Levelling, Metalling, and Sewering 12 Streets	Urban District Council	Frank Massie, A.M.I.C.E., Tetley House, Wakefield	„ 26
Waterloo, Lancs—Sewering, Flagging, &c., Sandringham-road.	Urban District Council	F. Spencer Yates, A.M.I.C.E., Surveyor, Waterloo, Lancs	„ 28
Stranorlar—Repairing Roads in District	Rural District Council	Geo. M'Laughlin, Clerk, Stranorlar	„ 28
Bedford—Paving Works	Urban Sanitary Authority	The Borough Surveyor's Office, Town Hall, Bedford	„ 29
Stanley—Street Works	Urban District Council	Joseph Routledge, Surveyor, Council Offices, Stanley, Durham	„ 29
Hebburn—Repairing Cement Footpaths	Urban District Council	J. B. Renton, Surveyor, Council Offices, Hebburn	„ 30
Erdington—Making-up Roads	Urban District Council	H. H. Humphries, District Engineer, Public Hall, Erdington	„ 30
Litherland—Completing Roads	Urban District Council	W. B. Gartod, C.E., Surveyor, 25, Sefton-road, Litherland	„ 31
Wolverhampton—Completing Streets off Canal-st. & Fryer-st.	Public Works Committee	J. W. Bradley, Borough Engineer, Town Hall, Wolverhampton	Sept. 2
Wellingborough—Granite and Slag (One Year)	Urban District Council	J. T. Parker, Clerk, 29, Church-street, Wellingborough	„ 4
Hipperholme—Setting Channel in Bailiffe Bridge Hill	Urban District Council	J. Sykes, Surveyor, Whitehall, Hipperholme	—
Bradford—Flagging (1,000 yards)		John Jackson, M.S.A., Architect, Barry-street, Bradford	—
Whitehall, Hipperholme—Laying Channel Stones (220 yards)	Urban District Council	J. Sykes, Surveyor, Whitehall, Hipperholme	—

SANITARY.

Mallow—Sewerage Works at Fever Hospital	Guardians	Maurice Regan, Clerk, Poor-Law Office, Mallow	Aug. 19
Macroom—Sewerage Works in Gorteenroe-street	Rural District Council	J. T. Murphy, Clerk, Macroom, Ireland	„ 19
Leigh-on-Sea—Cast-Iron Sewers, &c. (7,300 yards)	Urban District Council	Bailey, Denton, Son, and Lawford, Palace Chambers, Westminster	„ 21
Bangor—Sewer (550 yards), Ffriddoedd-road	Sanitary Committee	John Gill, A.M.I.C.E., Borough Surveyor, Bangor	„ 21
Droitwich—Drainage at Workhouse	Guardians	Arthur J. Bearcroft, Clerk, Board-room, Droitwich	„ 22
Manchester—Underground Convenience at Poultry Market	Sanitary Committee	The City Surveyor's Office, Town Hall, Manchester	„ 22
Belfast—Sewers, &c.	Corporation	The City Surveyor, Belfast	„ 23
Congleton—Main Drain (560 yards)	Common Land Trustees	C. Russel Hall, Surveyor, 1, Well-street, Congleton	„ 23
Uxbridge—Cleaning Filtration Tanks, &c.	Rural District Council	The Surveyor's Office, 24, New Windsor-street, Uxbridge	„ 24
Banstead, Surrey—Latrine Accommodation at School	Kensington & Chelsea S.D. Managrs	Cecil Sharpe, Architect, 11, Old Queen-street, S.W.	„ 25
Hartley Wintney—Sewage Disposal Works	Rural District Council	F. L. Wetherall, Clerk to Parish Council, Hartley Wintney	„ 25
Lees—Sewerage Works	Urban District Council	Blackburne, Page, and West, Engineers, 54, Union-street, Oldham	„ 25
Ashtead, Surrey—Sewerage Works	Epsom Rural District Council	Beesley, Son, and Nicholls, Engrs., 11, Victoria-street, Westminster	„ 29
Enfield—Underground Convenience in Market-place	Urban District Council	Richard Collins, Surveyor, Enfield	„ 30
Hebburn—Lowering John-street Sewer	Urban District Council	J. B. Renton, Surveyor, Council Offices, Hebburn	„ 30
Capelulo—Sewering (3 miles)	Penmaenmawr U.D.C.	Ernest Worrall, Surveyor, Penmaenmawr, Wales	„ 31
Basingstoke—Sewer, Lower Brook-street	Works Committee	George Fitton, Borough Surveyor, Town Hall, Basingstoke	„ 31
Windsor—Sanitary Conveniences under Guildhall	Town Council	The Borough Surveyor, Helena-road, Windsor	Sept. 2
Sonning—Sewering	Wokingham Rural District Council	R. W. Hamilton, 56, Hamilton-road, Reading	„ 4
Watford, Herts—Sanitary Improvements at Leavesden Asylum	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk House, Norfolk-street, W.C.	„ 4
Lyme Regis—Sewers for the Cobb District	Town Council	The Clerk, Town Hall, Lyme Regis	„ 4
Sutton, Surrey—Sewering, Levelling, &c., Egmont-road	Urban District Council	C. Chambers Smith, Surveyor, Council Offices, Public Hall, Sutton	„ 6

STEEL AND IRON.

Abercynon—Steelwork for Canal Bridge	Glamorgan County Council	T. Mansel Franklen, Clerk, Westgate-street, Cardiff	Aug. 19
Darwen—Steel Rails, Fishplates, Tie-Bars, Bolts, &c.	Corporation	The Borough Electrical Engineers, Darwen, Lancs	„ 22
India Office, S.W.—Rails, Fishplates, Fishbolts, &c.		The Director-General of Stores, India Office, Whitehall, S.W.	„ 22
Chorley—Cast-Iron Pipes (Twelve Months)	Corporation	John M'Cubbin, Gas Manager, Chorley, Lancs	„ 22
Bury—Cast-Iron Spigot and Socket Pipes (120 tons)	Waterworks Committee	J. Cartwright, M.I.C.E., Borough Engineer, Bury, Lancs.	„ 22
Southport—Forty Cast-Iron Manhole Covers	Corporation	R. P. Hirst, Borough Surveyor, Southport	„ 23
Manchester—Drain at Workhouse	Guardians	Mills and Murgatroyd, Architects, 23, Strutt-street, Manchester	„ 23
Bradford—Pipes, Castings, Steam Wrought-Iron Tubing, &c.	Gas & Electricity Supply Committee	The Gasworks, Mill-street, Bradford	„ 23
Southport—Rain-Water Pipes, Bends, &c.	Corporation	R. P. Hirst, Borough Surveyor, Southport	„ 23
Belfast—Cast-Iron Pipes and other Castings (2,036 tons)	City & District Water Commissionrs	L. L. Macassey, M.I.C.E., Belfast	„ 24
Christchurch—Steel and Cast-Iron Work	West Hampshire Waterworks Co.	R. St. George Moore, M.I.C.E., 17, Victoria-street, Westminster	„ 24
Belfast—Steel Pipes and Collars (235 tons)	City & District Water Commissionrs	L. L. Macassey, M.I.C.E., Belfast	„ 24
Bradford—Steel Girder Rails and Fishplates (2,155 tons)	Corporation	J. H. Cox, City Engineer, Town Hall, Bradford	„ 26
West Hartlepool—Arc Lamp Posts, Brackets, and Wall Boxes.	Corporation	Prof. A. B. W. Kennedy, 17, Victoria-street, Westminster, S.W.	„ 28
Westbury—Cast-Iron Pipes and Special Castings	Westbury & Worwellsdown R.D.C.	W. H. Stanley, A.M.I.C.E., Market House Chambers, Trowbridge	„ 30
Waterloo—Steel Tramway Rails, Fishplates, &c.	Urban District Council	F. Spencer Yates, A.M.I.C.E., Surveyor, Waterloo, Lancs	Sept. 6
East Ham—Steel Girder Tramway Rails (820 tons)	Urban District Council	W. C. Ullmann, M.I.E.E., The Limes, White Post-lane, East Ham	„ 6

STORES.

Stevenage—Granite (500 tons)	Urban District Council	Wm. Onslow Times, Clerk, Council Offices, Stevenage	Aug. 21
Barnet—Broken Granite (400 tons)	Urban District Council	H. W. Poole, Clerk, Barnet	„ 21
Cork—Limestone and Rubble Ballast (Two Years)	Harbour Commissioners	Jas. Price, M.I.C.E., Harbour Office, Cork	„ 22
Southport—Broken Stone (4,000 tons)	Corporation	R. P. Hirst, Borough Engineer, Southport	„ 22
Christiania—Copper and Brass Tubes		The Commercial Dept. of the Foreign Office, Whitehall, S.W.	„ 22
Darwen—Granite Setts and Wood Paving Blocks	Corporation	The Borough and Electrical Engineer's Office, Darwen, Lancs	„ 22
Egremont—Sewer Bricks (153,000), &c.	Wallasey Urban District Council	The Engineer, Public Offices, Egremont, Cheshire	„ 22
Southport—Portland Cement	Corporation	R. P. Hirst, Borough Engineer, Southport	„ 22
Barnet—Broken Granite (500 tons), &c.	South Mims Rural District Council.	G. Dickinson Byfield, Clerk, 16, High-street, Barnet	„ 22
Christiania—Broad-Gauge Stanchion Trucks (175)	State Railways Administration	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	„ 23
Spezia—Firebricks	Royal Arsenal Authorities	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	„ 25
Bradford—Granite Setts (5,000 tons)	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	„ 26
Bradford—Jarrah or Karri Wood-Paving Blocks (150,000)	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	„ 26
New Malden—Road Materials	Urban District Council	V. H. Davidson, C.E., Cambridge-road, New Malden	„ 26
Bradford—Granite Setts (500 tons)	Corporation	J. H. Cox, City Surveyor, Town Hall, Bradford	„ 26
Croydon—Broken Guernsey Granite		Sidney Stallard, Highway Surveyor, Croydon	Sept. 13
Huddersfield—White Bricks (10,000)		J. Whittell, Kirkburton, Huddersfield	—
Southend-on-Sea—Kentish Ragstone Pitching (7,000yd. super.)		Alexander Penney and Co., 107, Fenchurch-street, E.C.	—

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ORGANISED BUILDINGS.

NATURALISTS who study plants and animals have different ways of investigating their subject. According to one system, that known as morphology, a plant may be studied by comparing the relative positions of the members (say, in a sunflower) with those of other plants, and it is possible in this manner to draw up a classification of plant members. This is external morphology dealing with external features; but there is also an internal morphology, which investigates in a similar manner internal-organ sections of the stem, root, leaf, &c. We may apply a similar method of form-description to the study of architecturral style. In the process of designing our buildings, or developing plans, the interdependence or relation of one part to another appears to be the very basis of the architect's work, though strangely neglected in our modern method. The ordinary programme is something of this sort. A plan is arranged to comply with the instructions of a client. If it is a house, he wants his drawing-room or study to face a certain aspect, his dining-room to be in another part of the ground, and his kitchen offices in the rear, without the slightest regard to the convenience of the servants or the serving of the dinner. Or the plan is based on a previous model: the rooms or offices are located to suit an elevation, or to front a particular road. The reasoning is: "This is the main street, here must be the entrance, right and left the principal rooms." It is simply a matter of arranging according to a recognised order, and the elevations are fitted to it. The chief offices must occupy the main front; so much is settled, and the entrance must be put on this side, even if it separates two departments that ought to be together, or destroys the organic unity of the plan. Probably in a few cases this arrangement will be convenient; in a great many the social and serving functions work badly. What should be aimed at is so to combine the two that they will work smoothly, and with the least possible friction. A building ought to be looked at as an organic whole of one or more parts or functions. Or we may call the units cells. If its chief purpose is to hold a crowd of people, as in a large assembly-hall, or concert-room, or chapel, it may be looked upon as a one-celled building, and its plan should be arranged to give access to and to accommodate comfortably a large audience or congregation. A second part or cell inferior to the first will be the orchestra, or platform end. A design of this description is necessarily simple and easily comprehended. Convenient seating accommodation, entrance, and exits are the chief requirements.

A bank or an insurance office is a little more complex. There is, first, the official part, with its private rooms for managers and clerks; the cashier department, and the public space—each distinct and separated by partitions or screens and counters. A public library has at least three or four departments: (1) the lending department, (2) the borrowers' space, (3) the reading or news department, and (4) the reference department, in addition to the residence of the librarian. Each is a distinct function that has to be provided for, and the public must have easy access to it without entailing inconvenience on those who serve or who frequent other parts. The more thoroughly this is done the more successful is the design. Each of the departments of our buildings ought to be designed with a view to the particular organisation it is intended for.

An American writer, in speaking of the proper elements of a machine shop, draws some useful conclusions as to such a very utilitarian building that has a significance for the architect of more ambitious structures. He shows that in designing a modern machine-shop many distinct factors are necessary in arranging a shop of this kind. The foundry is a valuable adjunct to every important machine-shop. It is a distinct organisation, and it should be under such control that castings may be produced of such accuracy that cost of machinery and tools will be saved in the shop. The laboratory is another valuable adjunct for chemical and physical testing of the materials. He next enumerates such essentials as transmission of power, transportation of parts, flooring, heating, ventilating, and lighting, accommodation for workmen, and general fittings. The writer, Mr. H. F. L. Orcutt, shows easily enough how each of these factors facilitates the production of machine tools. Easy transmission of power, transportation of parts, good surroundings for workmen, such as light, warmth, and ventilation, and their comfortable accommodation are absolutely necessary to the production of good work. The same principle may be extended to other classes of buildings;—each part or function should be so organised for its special purpose that there should be no waste or loss. What friction and loss of valuable labour is entailed by a separation of two departments that have to co-operate together—say that of the town clerk and borough engineer—by the location of each on different floors of a building or separated by a long corridor. The absence of appliances for the easy transmission of orders, like the "transmission of power" or the transport of parts of a machine, may very seriously impede the business of a town. We would venture to say that a well-organised plan depends (1) on a proper recognition of the work of the departments accommodated; (2) on the relation of each department to the others; (3) on the grouping of offices round centres; (4) the reduction to a minimum of all corridors; (5) good lighting, heating, &c.

Let us illustrate by a few examples:—One of the defects of the modern building is the want of organisation in the plan. The average dwelling-house is, unfortunately, owing to our ideas of tenure, not designed for the individual owner or the family, but for the three-year or seven-year tenant; its plan has to be made to adapt itself to the ordinary class of tenants, and it is therefore built on a conventional type. Again, the municipal building is seldom arranged on any principle of official routine or work; but simply to accommodate so many officials and clerks, engaged in several separate departments, and without a conception of any intercommunication or relation between them. We have seen designs for municipal offices in which the town clerk, the principal officer of the corporation, occupies a suite of rooms shut off almost entirely from other officials with whom he has intimate and hourly relations every day, such as the public accountant, surveyor, and medical officer of health, to say nothing of minor officials, like inspector of weights and measures, sanitary officers, &c. Each of these officers also has reciprocal relations with each other. One would have thought in organising a plan for these several functionaries, that the process of business carried on should dictate the arrangements of the departments in the following manner:—As the chief official, who receives the instructions and resolutions of the council, and who has to give formal instructions to the surveyor or engineer or medical officer, and who in turn have to consult the clerk in respect of various matters in their departments, it is only following a natural law that the town clerk should occupy the leading position on the main floor, his private office being made the centre of a group of other central offices occupied by the surveyor, engineer, accountant, and medical officer, so that he may be able to hold immediate consultation with any of these officers. This group of offices would then be the central or leading group. The mayor, too, in his official capacity, should have his own room near the town clerk's. His clerks' offices should form a secondary circle or group of rooms in touch with the principal's office, and these again ought to be arranged in something like a natural order of precedence, the managing or chief clerk being in direct communication with the town clerk, and the others placed according to their subordinate ranks in connection with the managing clerk. A similar arrangement would be followed with the borough engineer or surveyor: his own private office should be accessible to that of the town clerk, and round him, grouped according to their several relative positions of importance, would be assigned his offices, the drawing-office occupying a prominent position, properly lighted. The medical officer of health should be in immediate communication with the sanitary inspector's offices, and be conveniently placed in connection with those subordinate officers whose business it is to see that the sanitary acts are duly carried out and administered. So with regard to the accountant, inspector of weights and measures, police department, each of which would occupy a separate position or centre, but arranged in something like organic order in relation to the rest. Committee rooms ought also to be planned conveniently to the town clerk and the mayor's rooms.

An equally complete organisation is necessary in a large group of hospital buildings, which is an assemblage of separated cells for different uses. First we have the pavilion with its series of wards for the sick or infirm, then the rooms for day and night nurses and the regular staff, the medical resident officers, the cooking and laundry departments, and the official rooms. We now understand how these several departments should be connected for easy working, the value of a central administration department connected by open corridors to the various blocks, some detached and isolated. The whole assemblage can be compared to a large organism, its cells and various functions under control, in which each patient receives the maximum attention and care of trained nurses and medical experts. Each patient or bed may be compared to a unit cell of an organism: he receives his medical aid and food through distinct channels or functions of officials, and these functions have to be distinctly laid down by means of special corridors in connection with the rooms of the medical staff and the kitchen. But the building of separated cells is not so easy a task for the architect; he can make his official blocks conspicuous and high, but the hospital ward-block must remain a collection of semi-isolated cells.

The big hotel is also an illustration of an organised building of a complex kind. It must always be a combination of a number of units or cells, singly or in suites, joined to a large administrative department. Gala or state rooms can be separately treated, and externally accentuated. It must provide for the privacy of the individual and the family, dining accommodation, smoking, reading, billiard playing separate functions, and these must be easily controlled. Another highly-organised structure is the public bath with its wash-houses, and its separate entrances for the sexes; and there is the large commercial warehouse or collection of rooms or cells for different classes of goods, clerks', and managerial offices. In all these the organised plan is essential; but this has not at present been grasped by the architect. Perhaps the best way for him to master organisation is to acquaint himself practically with the mode of life and work in each kind of building. Let him take up his abode in a block of municipal offices, and learn for himself what are the separate functions of each official; let him for a week or two examine the work done in a large hospital or in a commercial warehouse; let him become a visitor to a large town hotel. Only in this way can the architect be prepared to set down and prepare a plan that will in any sense be organised. The conventional or traditional plan-drawer is a man who looks over a number of plans, and then sits down to copy or modify one for his purpose.

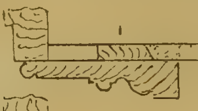
Mr. Leopold Eidlitz, in his work on "The Nature and Function of Art," observes truly that it is rarely that one and the same structure represents more than one idea, and he illustrates this by referring to a Greek temple, which contemplates the idea religion, but not that of a congregation; it is the habitation of a statue to the god or goddess without function, and this purpose is represented by a single cell expressed only on the outside. A church, on the other hand, he shows, admits a congregation and accommodates various groups as they arrange themselves for prayer, private and congregational; also certain rites like those of Baptism, Communion, processions and sermons, &c. A church is, therefore, a group of cells, separated, not necessarily by walls, but by colonnades or screens. Special acts of devotion like the Sacramental are emphasised by greater height and decoration. And he shows the cells or separate parts demand an external representation of the various acts done within the building, illustrating "the idea in the organism of the group." So in official buildings as in houses of Parliament, several groups must be joined. These are separated more entirely than in the last case, and are so placed as to tell their own story externally. This author goes on to describe a series of single cells, co-ordinate in their use, treated as divisions of one great cell as in a hospital, a prison, or warehouse where wards, or prison cells, or clerks' rooms are combined. Some of these cells, or groups of them, can be distinguished by accentuating and grouping their openings and external features, or by special modelling and decoration. The architect has to determine "the size and form of the single cells and their relative positions—the modelling, as it were, of the group." Mr. Eidlitz says this cannot be done "without a knowledge of the methods of construction and of the principles which govern these methods." We say the principles that govern their distribution and combination are derived from a knowledge of the use and function of each set of rooms, of the work of each official in such a building as a Parliament house, or a municipal block, or a hospital, or a warehouse; and this should be accomplished in the plan. Various factors contribute to a well-organised building. We have enumerated those which a machine shop ought to have, the ideal to follow being that the product should be continually moving in one direction, going in at one end in a raw state, and coming out at the other end as a finished article. So mechanical an act cannot be followed in any of those buildings we have named; but moving crowds or individuals obey certain laws quite as much, and ought to be aided by efficient entrances and means of egress. Each individual, whether he inhabits or visits a building for the purpose of inquiry, or business, or pleasure, should be afforded every convenience, easy communication, good light and ventilation; he should not be befogged by bewildering corridors or approaches, or stifled by badly-ventilated rooms; he should be able to sit down comfortably to enjoy music or a performance, and be able to retire without inconveniencing others; if it is his misfortune to go into a hospital, it is the duty of the designer to make his passage from the entrance to the ward as easy and pleasant as possible; to facilitate the administration of diet or medicine; and his sojourn at a large hotel ought, if possible, to afford him the comfort of a home and the luxuries of social surroundings and good diet.

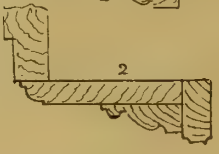
* * *

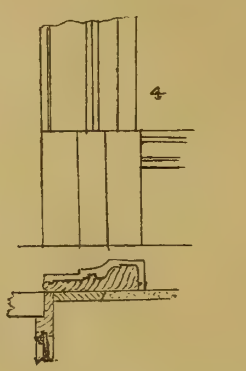
ESTIMATES.—XVIII.

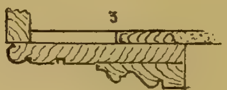
DOORS AND FRAMES—JAMB LININGS—ARCHITRAVES.

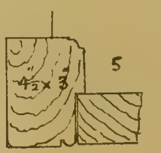
THESE are items easily priced by experienced estimators, though for special classes of work the quantities ought to be taken out, and we show how this is done. The prices for ordinary panelled doors are pretty fixed and uniform. It is customary to value door-frames at the foot cube, though the quantities generally give the lineal measurement. Taken by the foot cube, the price includes labour and profit, any small differences being averaged in the price. The chief thing necessary in this case is to find out how many feet run of the scantling will make a cube foot. Thus a frame 4in. by 3in. is 12 sectional parts or 1in. cube, or $^{1}/_{12}$th of a foot cube, so that at a given price per foot cube it is easy to find the price per foot run, or $^{1}/_{12}$th. If the frame is 4s. 6d. per foot cube, it will be $^{1}/_{12}$th of 4s. 6d. = 4½d.; if 6s. per foot cube, $^{1}/_{12}$th of 6s. = 6d., and so for other dimensions. A table of sizes of frames, showing the equivalent prices per foot cube and foot run, is necessary to save labour. In estimating items of this kind tables of equivalents are extremely useful in shortening calculation.

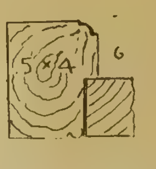












Wainscot, Honduras, or mahogany doors are often priced about the same; but there is more waste in wainscot, and it is therefore dearer, and some add 10 per cent. for the latter. Laxton gives the following prime cost as the basis of the prices of both these hard woods. Honduras mahogany or wainscot, 1s. 2d.; Spanish mahogany, 1s. 8d.; ditto for panels 1s. 10d. per foot super. on the inch. Four-panel 1½in. moulded and square doors are priced at 3s. 7d. in Honduras, and 4s. 6d. with Spanish panels; for six-panel doors add 4d. and 6d.; for 2in. moulded both sides the price is put at 4s. 8d. for Honduras mahogany, and 6s. 3d. ditto with Spanish mahogany panels.

The price of oak is taken by the inch in thickness increasing by quarters of an inch. 1in. is about 8s. per foot super. The current price for wainscot per log, 18c.ft. Crown English and Dutch is £6 to £7 15s. Oak door-frames, to prevent warping, are made up in pieces or cased round a deal core for good work. The pieces of wainscot are cross-tongued and glued. Foreign oak is generally used, as English oak requires careful seasoning. Oak joinery costs about three times the price of deal, including profit. Thus, if a solid fir frame cost 10d. per foot run, an oak one would be 10d. × 3 = 30d. = 2s. 6d. per foot. The labours are greater in oak—about 100 per cent. more than on deal work.

FRAMED AND BRACED DOORS.

49ft. super. 2½in. framed and braced doors, filled in with tongued and beaded boarding in 4½in. widths.

We may get out quantities for one door by taking lengths of stiles and rails, squaring them by 7in., bottom rail by 11in. This will be found to give about 16ft. super. of 2½in. deal at 5d. = 6s. 8d. Add to this 19ft. of 1in. deal at 2½d. = 4s. Add to this for nails, glue, &c., say, 4d. Total, 11s. Divide by superficial of door 24ft. 6in., gives 5½d. per foot. Or—

	£	s.	d.
Cost of material per foot, say	0	0	5½
Labour making, say	0	0	7
Labour fitting, &c., say	0	0	1½
Cost per foot super.	0	1	2

This is rather a low price for two doors; a fair price would be 1s. 6d. per foot.

48ft. super. 2½in. framed and braced doors as before, with segmented head.

These are valued as if square. Add to the last price about one-fourth more, say, 1s. 10d. If the head is circular, add one-half more, or 50 per cent.

24ft. 6in. super. 2in. framed and braced door, the stiles, top-rail, and braces of batten width, bottom rail 11in. wide, lock rail 9in. wide, stop-chamfered, filled in with 1in. matched and beaded both sides boarding in 4½in. widths.

We should price this door at 1s. 6d. to 1s. 8d. per foot.

DOOR FRAMES.

28ft. run. 4in. by 3in. deal frame, rebated and twice beaded. (See sketches 5 and 6).

A frame of this size contains 12 sectional inches or "parts," and is equal to 1in. cube, or a twelfth part of a cube foot, so that it will take 12ft. lineal of frame to make a cube foot, and if we say the price per foot cube is 6s., which includes labour, fixing, and profit, the price per foot run will be $^{1}/_{12}$th of 6s. = 6d. Or, we may say the price is 4s. 6d., which comes out at 4½d. per foot run. The items of material and labour may be calculated thus:—

	£	s.	
Cost of $^{1}/_{12}$ft. cube at, say, 2s.	0	0	
Labour rebating, beading, and framing per foot run, say	0	0	4
	0	0	6

The constant for wrought, rebated, and

beaded frames of this section is ·320 per foot super., 1/12th labour at this is about 2¾d., which will reduce the price to, say, 5d. per foot run.

38ft. run. 4½in. by 3in. frame, rebated, and twice beaded. (See sketch 5.)

There would be about 1½ft. cube in each frame of 17ft. run. If we put the value per foot cube of wrought for at 6s., the cost of frame would be 9s., which would equal about 6d. per foot run, or, say—

	£	s.	d.
Cost of deal at 2s. 6d. per foot cube per foot run	0	0	3
Labour to rebate 2¼in. girth at ·008	0	0	0¾
Labour to beading (constant ·003)	0	0	0¼
Labour to framing (constant ·040)	0	0	4
Cost per foot run	0	0	8

6ft. 4½in. by 3in. ditto to segment head, out of 4½in. by 9in.

This head is cut out of a piece 9in. deep, equal to about 1½ft. cube, say, 3s. 9d. at above rate. Then for labour we may double the price for straight work, say, 10d.

	£	s.	d.
Cost of deal at above rate per foot run	0	0	7
Labour for rebating, beading, and framing	0	0	10
Per foot run	0	1	5

28ft. run. 5in. by 4in. frame, rebated and moulded (ovolo), girth 1½in. (See sketch 6.)

There would be about a foot cube in 7ft. lineal, or at above rate, the cost of deal per foot run would be 4d. Add to this cost of rebating ¾d. a foot, and of labour forming ovolo, 1½ girth (constant ·012) 1d. per foot, labour framing, say, 4d., equal to 9¾d. per foot run.

17ft. run. 5in. by 4in. oak rebated and beaded frame.

If this is Baltic oak, which does not split or warp like English, we may price this item at three times the cost of a deal frame, which is considered about fair for oak labour and material. Say the cost of the last item is 10d., three times that is 30d. = 2s. 6d. The labour upon oak may be priced at about double that of deal.

63ft. super. Labour making and fixing wrought, rebated, and beaded door-frames, 5in. by 4in.

This item does not include material. We may use the constant ·290 days of joiner, which will give at current rate of wages 2s. 5d. per foot super.

972ft. run. 1in. wrought narrow grounds, 4½in. wide.

These are to be placed round doors and windows, splayed for plastering. These may be priced at 3d. to 4d. per foot run, including profit.

1,012ft. run. 1in. skirting grounds ditto, 2½in. wide.

These grounds may be taken at 2d. per foot run.

1,012ft. run. 2in. by 1in. fillet.

This may be priced at 1d. nailed.

700ft. run. Narrow grounds 2½in. wide, rebated or grooved.

Put this at 2½d. per foot.

JAMB-LININGS, ETC.

68ft. super. 1¼in. jamb-linings double rebated, twice beaded, tongued at angles. (See sketch 4.)

Laxton prices double rebated 1¼in. linings at 10½d. per foot super., and 2d. more if beaded on both edges. To analyse a foot:

	£	s.	d.
Cost of square foot of 1¼in. deal, say	0	0	2¾
Labour double rebate and beaded edges, constant (·77 hours of a joiner)	0	0	7¾
	0	0	10½

34ft. super. 1¼in. ditto, framed and moulded in 8 panels, and tongued at angles.

Add to the last price for panels 1s. 3d., equal to 2s. 1½d. per foot.

48ft. super. 1in. deal single-rebated jamb-lining, with groove for plastering.

This may be put down at 7d. per foot super. If beaded, add another 1d.

42ft. super. 1in. deal window-lining, tongued at angles and splayed and tongued to frame.

Price at, say, 6d. per foot.

34ft. super. 1¼in. ditto ditto, tongued to frame.

For thicker stuff, add 1½d. per foot.

25ft. super. 1½in. rounded window-boards and bearers.

	£	s.	d.
Say cost of 1ft. super. of 1½ deal	0	0	2½
Planing, at constant ·010	0	0	1
Labour rounding edge, ·006	0	0	0¾
„ fixing bearers, say	0	0	3
	0	0	7½

Say 8d.

One price-book puts this down at 9d. per foot super.

36ft. run. 1¼in. by 7in. window-board, rebated and rounded.

Put this at same price, as it is rebated.

No. 20. Notched, returned, and mitred ends.

These are notched for architraves, and may be called "fitted ends," and may be priced at a foot run of window-board; but as they are small, 6d. each will do.

No 10. Fitted ends to ditto.

Put half price of foot run of board, say, 3d.

30ft. super. 1½in. window-boards 13in. wide, with moulding tongued and rebated to frame.

	£	s.	d.
Cost of a foot of 1½ deal	0	0	3
Planing	0	0	1½
Labour moulding edge, say	0	0	1½
„ rebating and tonguing to frame	0	0	1¼
„ Fixing	0	0	2
	0	0	9¼

Say 10d. per foot super.

45ft. run. 1¼in. by 11in. jamb-lining, cross-tongued, twice chamfered, double rebated, tongued at angles.

This may be priced at about the same as first item. A foot run would be nearly a foot superficial at this width—say 10d. per foot run.

20ft. run. Window nosings 1½in. thick, 3in. wide, with moulding tongued under, rebated to frame.

No. 4. Fitted ends, 4d. each.
No. 4. Mitred ends, 6d. each.

Nosings would cost, for material, 1d. per foot run; add for rebating and tonguing, say, ½d.; nosing, 1d.; moulding under 2in. girth, 1¼d.; 3¾d. altogether—say 4d.

130ft. run. 1in. by 3in. splayed grounds.

	£	s.	d.
Deal would be about ¾d. per foot lineal, say	0	0	1
Splaying one edge (constant ·002)	0	0	0¼
Fixing, &c. (constant ·005)	0	0	0½
Planing	0	0	1
	0	0	2¾

90ft. run. Ditto plugged.

Plugging would cost a trifle more—about ½d. more.

45ft. run. 1in. by 3in., twice splayed grounds.

Add to former price another ¼d. for twice-splayed edge—say 3d.

30ft. run. Ditto framed and splayed.

Price this at about 3½d. per foot run.

ARCHITRAVES.

410ft. run. 2¼in. by 1¼in. moulded architraves and mitres. (See sketches 1, 2, 3, and 4.)

If no detail is given, the price of stock mouldings may be affixed, and for this purpose a trade list of mouldings of a moulding manufacturer is useful. For a moulding of this size 12s. per foot cube, including fixing and profit, is a fair price, or about equal to 4d. per foot run. Price each mitre at the price of a foot run, or 4d.

73ft. run. Moulded architrave, 4in. by 3in., mitres.

This is a larger-sized moulding, and is therefore less in price, say, 7s. 6d. per foot cube, 4in. by 3in. = 1in., and 1ft. cube would be 12ft. lineal.

	£	s.	d.
1/12ft. cube at 7s. 6d.	0	0	7½

This price includes fixing and profit.

The quantities may be taken as follows, per foot run.

		£	s.	d.
1 0 0 4	4in. super. 3in. deal at 6d.	0	0	2
1 0 0 8	8in. super. moulding at ·072, say	0	0	4½
	Per foot run	0	0	6½

Mitres to be put at 6½d. each.

42ft. run. 4½in. by 2¼in. deal architrave moulding, and No. 4 mitres.

Worth about 7s. 6d. per foot cube, fixed complete; say, about 7d. per foot run. Price mitres at one foot run each.

64ft. run, 4in. by 3in. deal moulding and mitres.

If this is a specially designed moulding, the price would be equal to 7s. 6d. per foot cube = 7½d. per foot run. Moulding-irons would cost 18s. if made to architect's design, and for a small quantity would add materially to the price; but if stock pattern mouldings would do, 6s. per foot cube, including fixing and profit. This would be for 4in. by 3in. section = 1in. cube, equal 1/12th of a foot cube = 6d. per foot run. Mitres may be priced as in last item at one foot run.

GROINED ARCH VAULTING.

THE "Groined Arch as a Covering for Reservoirs and Sand Filters" is the title of an elaborate mathematical investigation in a recent number of the *Transactions* of the American Society of Civil Engineers by Mr. Leonard Metcalf, Assoc.M. The author had to calculate the volume of masonry in the elliptical groined arch roof covering a sand filter for the Somersworth N.H. Waterworks, and he deduced a series of formulæ giving the volume of masonry in its cylindrical, groined, and other forms. These formulæ have been amplified, and the author has added a sketch of the development of the groined arch and the relative volumes of masonry in the several types of arches; also a method for computing the strength of this form of construction. The author describes the dome or spherical arch, the cloistered arch, the cylindrical or groined arch, and shows that the groined arch, "even more than the domical, gives naturally effects of great spaciousness, simplicity and stability of form well adapted to use in such engineering structures as covered reservoirs, &c., in which economy and stability of construction, and air space for convenience in operation, and ventilation are the prime requisites, and in which the presence of supporting pillars is no serious objection."

After a brief outline of the history of the groined arch, the author refers to its adaptability as a roof-covering for large reservoirs and sand filter-beds, &c., in which large spans are not required nor piers objectionable. Briefly, first, it affords greater air-space and spaciousness under the vaulting for the circulation of air and aëration of the water; second, it is economical; third, it saves lintel arches; fourth, it facilitates lighting, ventilation and access; fifth, ease of construction, and adaptability to concrete construction, &c. The groined arch is also better adapted to roof rectangular areas. The author then proceeds to deal with the method of computing the amount of masonry in the different systems of vaulting, and the strength of each, and for this purpose he assumes a given square filter area, roofed over by a groined vault of concrete made up of certain units, the groined arch unit, the cloistered arch unit, and the cylindrical arch unit. Each of these units is next mathematically discussed, and formulæ deduced, by the aid of which may be found the volume of masonry, &c. The method adopted is to compute the volume of masonry, as that of a circumscribed prism, from which has been deducted the volume of the air-space between it and the inclosed masonry. The author gives a table which shows the values deduced for the volume of the air-space between the horizontal plane of the springing and the soffit of the various unit types of vaulting, by which the volume of masonry can be computed. Other tables are prepared, one comparing the ratios of the volume of masonry in the several types of arch units, also the pier area and width of abutment; another table gives a comparison of the abutments of masonry in the elliptical and semicircular groined, cloistered, and cylindrical arch units, with that in a circumscribed rectangular prism passing through the springing lines and the (extrados) crown of the vaulting. The method of computing the strength of arch is that of De Grande and Résal, which method the author adopts and translates in his interesting paper. Engineers who have to cover reservoirs and filter-beds will find the deductions and formulæ here given of some use. Concrete, of course, adds materially to the strength and stability of a groined vault covering, and the effect of a mass of well-compacted concrete is that of a shell of masonry without thrust supported on piers at intervals.

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NEW CHRIST'S HOSPITAL SCHOOLS, HORSHAM.

THE new Christ's Hospital school buildings at Stammerham, some two miles west of Horsham, which will replace the Blue Coat School in Newgate-street, are, says the *City Press*, being erected. Nearly two years have elapsed since the foundation-stone was laid by the Prince of Wales, and within another two years the new buildings will be open. The site includes some 1,400 acres, purchased from the Aylesbury Dairy Co., whose late headquarters are being converted into an engineering depot for the school. The new buildings consist of seven large red brick blocks, extending from east to west, a water tower 115ft. in height rising from the central block. Clustering round this tower are the kitchens, the cooks' houses, the central domestic offices, the dining-hall, and the court-room. These are well on the road towards completion. The last named is to be practically a repetition of the present room in Newgate-street, and all the fittings of the old apartment are to be installed in its successor, if their antiquity will permit their removal intact. The same idea prevails to a certain extent with regard to the dining-hall, whither the remarkable painting representing the granting of the charter by the boy King Edward VI., which now hangs in the old hall, is to be removed. The new hall, which, in size, exceeds its predecessor, and, unlike that, is to be used as a refectory only, is 154ft. by 56ft., and 40ft. high. The sides, however, are to be wood-panelled to a height of 11ft., whence to the level of the window sills on the south front will stretch a plaster frieze, the remaining height to the ceiling being executed in red facing bricks. The chief kitchen measures 50ft. by 30ft., and is flanked by two sculleries, each 30ft. square. Adjacent are the steward's stores, the kitchenmaids' apartments, the buttery, the rooms for men-servants, and the head cook's house. From the central block, a subway gives access to the rest of the buildings disposed along the main front. It extends for about a quarter of a mile, and consists of an underground passage 10ft. wide, constructed of white glazed bricks. The subway will house all the pipes, mains, electrical wires, &c.

On each side of the central block, three other buildings have been already erected. These are for the reception of the boys. All are similar in appearance and arrangement. Each house block is like the letter E on plan. A matron will be accommodated in the centre of each house, occupying, with her staff, this position on all the floors. The boys will be provided for in the two end projections of the front, each of which will contain 50, who will all be under the eye of a house master. The whole of the buildings are being constructed on a fireproof principle. The block at each end of the façade on its outer side has a house attached for the accommodation of a married master, and when all the houses are completed they will be united by ornamental walls and railings. They are to be used entirely as homes for the boys. Study is to be confined to the various class-rooms, which are grouped round a central quadrangle. The dining-hall, already described, forms part of its northern boundary. Immediately opposite will rise the large hall, which will be 150ft. by 50ft. It will contain an organ gallery, and will accommodate upwards of 1,500 persons. The open roof will be surmounted on the exterior by a tower containing a clock and a peal of bells. To the right and left of this hall, but outside the quadrangle, blocks of class-rooms are to be built, from which the central hall may be reached by stone bridges giving access to the gallery floor. On the western side of the quadrangle the chapel will eventually rise.

On the opposite or eastern side of the quadrangle will be the science and art schools and the boys' library. The quadrangle will be 350ft. long by 250ft. wide, and cloisters will extend along both sides of it. The head master's house will adjoin the chapel; masters' houses, stand near, centred in grounds of their own; and there will also be an infirmary and sanatorium, and a preparatory school, which is to be removed from Hertford. A swimming bath and a gymnasium complete the list of buildings. The contractors are Messrs. James Longley and Co., of Crawley, Sussex, from designs prepared by Messrs. Aston Webb and E. Ingress Bell, Mr. H. W. Tingley is the manager, and Mr. James Proudfoot, the clerk of works.

The architects' design, selected in competition, was illustrated in the Building News for June 22 and 29, and July 6 and 13, 1894, and the modified and adopted scheme by a bird's-eye perspective in our issue of Oct. 22, 1897.

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THE GEOLOGICAL SURVEY.

THE second annual Summary of Progress of the Geological Survey of the United Kingdom, just published, deals with the operations of 1898. In England and Wales the energies of the service were mainly devoted to revising the counties upon the 6in. maps. This revision is in two directions. On the one hand the superficial deposits are traced out with special care, so as to lay a foundation for a general agricultural or subsoil map of the whole country; while, on the other, the various mineral districts originally surveyed on the 1in. maps—then the only Ordnance sheets available—are being mapped out on a larger scale, and brought up to date. The area of England and Wales revised in this way during the year was 690 square miles. The extent of boundary lines traced amounted to 3,077 miles, more than half of which were connected with the mapping of the superficial deposits, and taking the country as a whole, each square mile of ground surveyed involved the tracing of about $4\frac{1}{2}$ miles of geological boundaries. In Scotland the area surveyed was $610\frac{3}{8}$ square miles, and the aggregate length of boundary lines run was $3,868\frac{1}{2}$ miles; thus, on the average, rather more than six miles of geological lines had to be traced for each square mile mapped. In Ireland, the field-work consisted of revising the published maps in the light of fresh evidence which has appeared during the long lapse of time since they were issued, and in bringing them abreast of the present state of geological knowledge. With regard to the results, special attention is drawn by the Director-General to the researches among the younger granites of the Highlands, particularly in the Cairngorm mountains and the Ben Cruachan group; to the numerous Cambrian fossils obtained in Skye; to the discovery of more new fishes in the Upper Silurian rocks of Lanark and Ayrshire, in addition to the remarkable series announced in the summary for 1897; to the evidence of the existence of volcanoes in Somerset belonging to the time of the Carboniferous Limestone; to the new light thrown on the structure and probable extension of the North Staffordshire coalfield; to the additional information obtained regarding the volcanic history of the western mainland of Scotland and the Inner Hebrides; and to the fresh data gathered from all parts of the three kingdoms with respect to the successive stages of the Ice Age. A large part of the time of the resident officers in London, Edinburgh, and Dublin is occupied in giving information about matters which involve a knowledge of geology and of the geological structure of the British Isles. Hundreds of applications are made every year by the general public as well as by the various public departments, and the questions are not confined to these islands, but frequently relate to the colonies and to foreign countries. Among the subjects on which advice has been asked are those of soils in relation to agricultural development, sites for market gardens, situations for cemeteries, routes for light railways, and the position, extent, and quality of building-stones, road-metal, coal seams, metallic ores, peat, &c.

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HARDENING PLASTER OF PARIS.

A GERMAN patent has been granted for the treatment of articles of plaster of Paris with an aqueous solution of ammonium borate, for the purpose of hardening them and rendering them insoluble in water. A simple and efficient process for accomplishing this object would be highly desirable, as it would serve to greatly prolong the life of plaster casts, which, being quite soft and not entirely insoluble, sooner or later become superficially defaced, and washing specially wears down the outlines of the object. The process above referred to is said to give results decidedly superior to anything that has heretofore been proposed. The hardening liquid may either be mingled with the plaster in the act of moulding or may be applied on the surface of the finished casts with a brush. The solution is prepared by dissolving boracic acid in warm water and adding thereto sufficient ammonia to form the borate, which remains in the solution. The manner of using the solution is thus described:—The saturation of the gypsum or painting of the plaster of Paris is carried out in the cold. The objects are subsequently rinsed off and dried. The surface becomes very hard after two days and insoluble in water, while the induration in the interior advances more slowly. By means of the fluid described, gypsum floors can be hardened and rendered more durable and impervious to the influence of the weather. Saturating with ammonium borate is said to be especially useful on exterior walls of buildings, barracks, &c.; on the latter, because experiments have proved an antiseptic action of the liquid.

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NATURAL VENTILATION.—IV.

By Robert Boyle.

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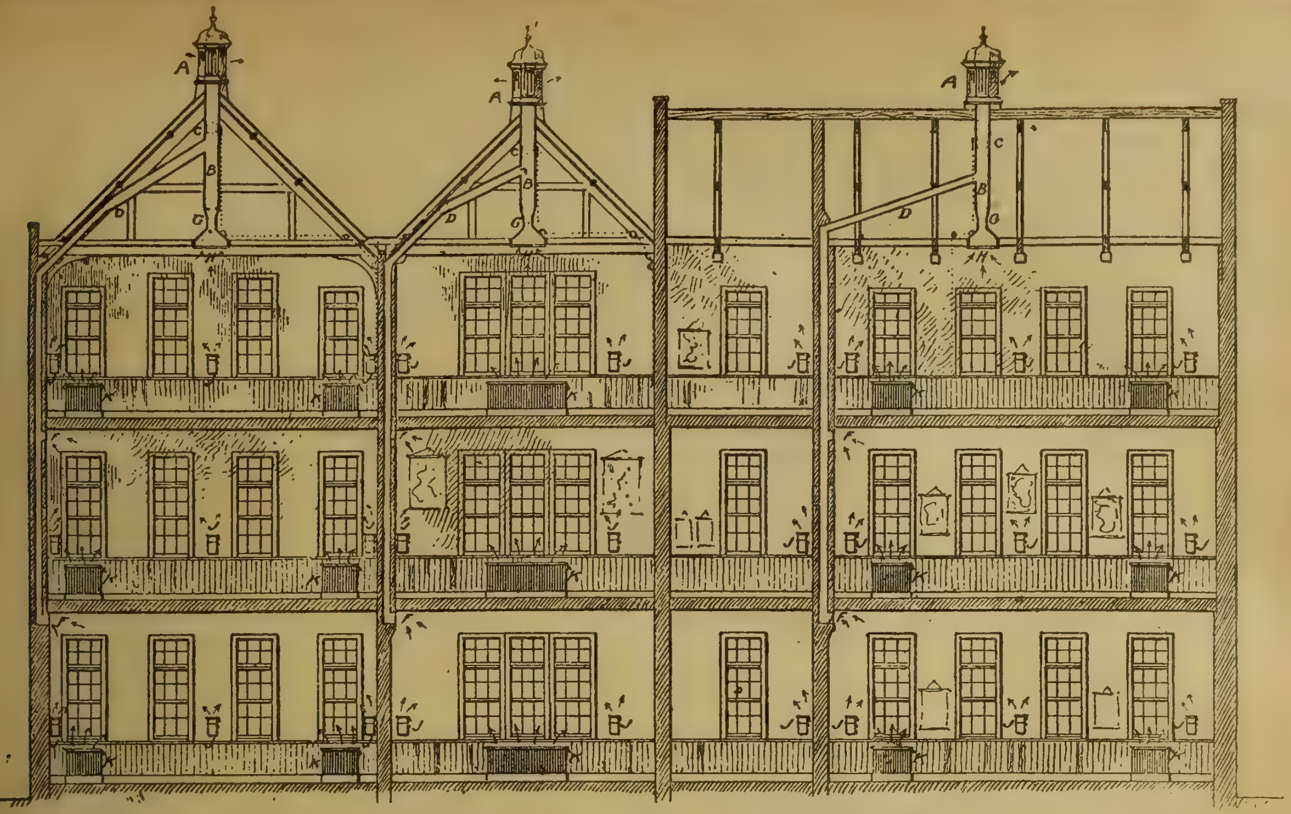
THE efficient ventilation of schoolrooms, where large numbers of children are congregated for hours together, is of the very first importance. Healthy bodies make healthy minds, and children who pursue their studies in a pure atmosphere, free from draughts and not overheated, make much greater progress than children who are confined in badly-ventilated, overheated, and draughty rooms. The greatest care should be taken to prevent down-draughts in cold weather, such as proceed from the adjustable ventilators which are commonly fixed in the upper parts of the windows, and which permit a large body of cold air to blow directly into the classrooms and descend upon the heads of the children, cooling and returning the expired air to be rebreathed. This is one of the most pernicious forms of ventilation that can be employed in cold weather, and is not only a source of discomfort to the children and the teachers, but is also a prolific cause of illness. When windows are utilised for the admission of air it should enter through protected openings at the lower parts, and be deflected upwards. This not only minimises draughts, but insures more complete diffusion.

A still safer and more satisfactory method of admitting air in cold weather is the employment of air-inlet brackets or tubes fixed round the walls at suitable distances from each other, fitted with regulating valves to control the supply. The velocity of the air should not exceed 2ft. per second if draughts are to be avoided. Ventilating radiators placed in the window recesses not only heat the room but admit a plentiful supply of fresh-air warmed to a healthy temperature. Hot air which is also employed to heat the room should never be used for the purposes of ventilation, as air raised to a temperature such as is required to effectively heat a building is thereby greatly deteriorated, the oxygen being, to a certain extent, destroyed, and the bracing and tonic qualities of the air lowered. The authorities on the subject condemn this method of heating as undesirable and injurious to health.

Radiant heat is the healthiest form of heating, as with it the walls can be more effectually warmed than with hot air, and the fresh-air supply may be heated to a comfortable temperature without in the slightest degree injuring it



LONGITUDINAL SECTION OF A BOARD SCHOOL FITTED WITH A NATURAL SYSTEM OF VENTILATION.

_a_, Roof ventilators. _b_, Main extraction-shafts. _c_, Regulating valves. _d_, Branch pipes connected with extraction-flues in walls of class-rooms. _e_, Extraction-flues in walls communicating each with two rooms. _f_, Foul-air outlets from classrooms into extraction-flues. _g_, Branch extraction pipes from top classrooms. _h_, Ventilating openings in ceilings. _j_, Air inlet-brackets admitting screened and purified air. _k_, Ventilating radiators admitting warmed, screened, and purified air. [Note.—The fresh-air supply admitted through the inlets, screened, purified, and warmed or cooled, as required, traverses the classrooms on its way to the foul-air exits, on the opposite sides of the rooms, insuring complete diffusion and change of air at all times without draught.]

In warm weather open windows may safely be employed to supplement the ventilation, as there is then not the same danger from draughts as in the winter, when special ventilating arrangements are most required, and are, indeed, an absolute necessity. When the temperature of the air in a classroom is 60° to 65° F., the air is expelled from the lungs at a temperature of 85° to 90° F., and, along with the heated exhalations from the body, ascends with considerable velocity to the upper parts of the room, from whence it should be drawn off, and not permitted to return to be reinhaled.

The extraction should, therefore, always be from above, which can easily be effected by the intelligent utilisation of the natural forces which are always at work, in the never-ceasing movement which exists in the atmosphere, and without the aid of costly mechanical appliances, which are unnecessary, and which have not been found in actual practice to be so efficient or reliable as natural ventilation, when properly applied. Great care should, however, be taken in the selection of ventilators, as much depends upon their correct construction. The most dangerous form of ventilation is where the air is admitted at the higher parts of the room and forced downwards by propulsion, and extracted near the floor, as the ascending vitiated air is thereby returned—in opposition to the natural laws which govern ventilation—to be reinhaled along with the products of combustion and other deleterious matter contained in the air.

In a paper on "Ventilation," read before the Society of Arts, London, the lecturer said: "After several tests in schools ventilated on each system, it was clearly demonstrated that in none of the schools examined and ventilated mechanically by extraction—even in a new school opened for a week or two—was the air found to be more pure than in those examined and ventilated naturally without any mechanism."

According to the analysis, the number of bacteria found in the air of the schools ventilated naturally were about 25 per cent. less than in the air of the schools artifically ventilated.

"The report on the influenza epidemic," says the *Local Government Journal*, "presented to Parliament by the Local Government Board indicates the extreme importance of proper ventilation—especially in schools—and is pronounced to be the only real safeguard against that disease.

"The statistics given point to one town where the schools are mechanically ventilated on the down-draught principle, as being the 'chief focus of the disease in Scotland. So far as the children in the schools are concerned, this is easily accounted for, as the warm, infected air expelled from the lungs is returned by the descending current, and is not only reinhaled, but is also breathed by the other scholars.

"With natural ventilation by diffusion and extraction this cannot occur, as the air is admitted at a level, and in a manner in accordance with the laws of nature, the hot, vitiated air being drawn off at the top of the building, to where it ascends, and not permitted to return, as with downward ventilation, to spread disease and death among those compelled to breathe it.

"At the congress of the British Institute of Public Health, Mr. J. T. Bailey, architect to the London School Board, read a paper in which he stated his experience of the ventilation of schools, the method which he found most satisfactory being the 'natural' system. Mr. Bailey cited as an example the Hugh Myddleton School, opened by H.R.H. the Prince of Wales in December, 1893, which is ventilated with a 'natural' system, with which method Mr. Bailey said 'There was an entire absence of what is known as the school smell, and these means have proved amply sufficient in their results.'"

Professor Carnelley, in a report on the ventilation of schools, comparing the cost of natural with artificial ventilation, says, "In naturally-ventilated schools, the cost of ventilation is but a fraction. With mechanically-ventilated schools this comparison cannot be made. To fit up a school for 1,000 children with mechanical ventilation would cost from £400 to £700 more than if one of the ordinary methods were employed."

There are many different contrivances in use for washing, screening, and purifying the air supply, the majority of which answer their purpose fairly well, though the evidence would seem to indicate that they are found to be most effective when employed in connection with a "natural" system of ventilation, where the air is not mechanically propelled, but is drawn through by extraction, the air being more thoroughly purified when drawn in at a *low* velocity than when forced in under pressure.

Galton says, "If air is forced rapidly through a screen it cannot fail to carry dust with it."

The Metropolitan Asylums Board employ a natural system of ventilation by extraction from the ceiling, and admission of air from below—the plan approved by the Local Government Board. The purity and freshness of the air in the wards, especially in the more recent hospitals, is remarkable. The fresh air supply is screened and purified, and the temperature can be regulated as required. No fog or other impurities in the external air ever find access to the wards, the atmosphere of which is perfectly clear and bright, even during a dense fog.

Sir Henry Burdett, in "Hospitals and Asylums of the World," states that after "A close examination of, and several tests which we applied, the system of ventilation (Plenum) at the Victoria General Infirmary (Glasgow) convince us that whereas the main duct is kept comparatively free from grit and dust, the small ducts communicating directly with the wards have not been protected against the intrusion of these deleterious matters. Indeed, the evidence shows that with the air very much enters that should be excluded from the wards, as the walls and ceilings eloquently testify. We are of the opinion that the method of washing the air is imperfect, and might be improved. This would tend to minimise the amount of dust and blacks which at present find their way into the wards."

Dr. Armstong, a Royal Commissioner on ventilation, says: "Unfortunately, I have lived for the last dozen years or more under a system in which air is forced in, and anything more pernicious I cannot imagine—in London, at all events. It might be satifactory, perhaps, in the dustless atmosphere of the country, but in the dust-laden air of the Metropolis such a system is abominable, and my experience would lead me to prefer in all cases the introduction of air by suction rather than by pressure. That system has the great advantage that the air can be introduced at a very large number of places without producing draughts."

In the discussion on a paper recently read before the Royal Institute of British Architects, Mr. E. W. Mountford, F.R.I.B.A., said, "Only quite recently several members of the Institute Council were taken over a large building in Birmingham which had recently been fitted up with this system, and he had been struck with the considerable accumulation of very black dust in the ducts through which the warmed air was forced into the various wards. Now, that dust represented simply the thicker and heavier particles which the fans had not been able to force into the wards, and it seemed to him an absolute certainty that a great deal of dust had been forced into the wards and swallowed by the patients. In a new building there was not much objection to that possibly; but as time went on and the soot accumulated, and more and more was forced into the lungs of the patients, it would become a very big question whether the 'Plenum' system would not be taken out of those buildings, and something of a different nature put in."

(*To be continued.*)

GLASS PAVEMENT.

EARLY in October, 1898, a paving company of Lyons, France, began laying on the Rue de la République, in that city, a piece of pavement of ceramo-crystal, ceramic stone, or devitrified glass. During the months of November and December and thus far in 1899 this pavement has been driven over during all hours of the day and night. It has stood as hard usage as any pavement could be subjected to during that time, and is still said to be in an admirable state of preservation. The glass or ceramic stone pavement is laid in the form of blocks 8in. square, each block containing sixteen parts in the form of checkers. These blocks are so closely fitted together that water cannot pass between them, and the whole pavement looks like one large checkerboard. The road-bed slopes gently to the walk on each side. Some of the edges of the checkers have been broken off by wear. United States Consul Covert counted some twenty of them that have been slightly chipped on the edges. It is contended that this does not argue against the value of the material as a pavement, and that any kind of stone would have suffered just as much or more in the same time.

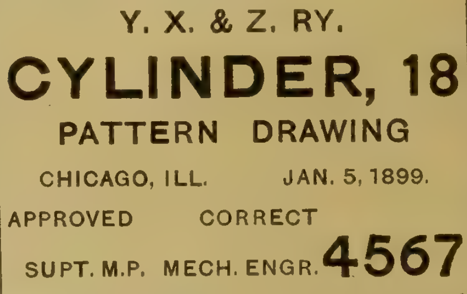
Mr. Covert visited the Ceramo-Crystal Manufacturing Company's works at the suburban village of Demi-Lune, about six miles from Lyons. The factories cover nearly 8,000 square yards of ground. Work is now stopped in them while additions are being made to the buildings in the shape of second stories. In the yards are many tons of broken bottles, which the superintendent told him was their "raw material." On the four sides of a large brick smokestack are specimens of ceramo-crystal for buildings and interior decoration, some of the pieces as smooth as highly polished marble, others being rough, like cut stone, and still others having a surface like common brick. The advantages attributed to this ceramo-crystal by the manufacturers are: As a pavement, it has a greater resistance than stone; it is a poor conductor of heat, and ice will not form upon it readily; dirt will not accumulate upon it as easily as upon stone, and it will not retain microbes; it is more durable than stone and just as cheap. The Central Architectural Society of France made a report recently on this ceramic stone.

An elaborate article in the "Revue des Deux Mondes" treated the question under the heading of "A Glass House," the writer asserting that a large house constructed entirely of glass would be an attractive feature of the coming World's Exposition in 1900. He said that glass could be used for tubes, pipes, vats, tiles, smokestacks for factories, and for buildings. Double glass walls in a house would admit of the circulation between them of cold or warm air, thus regulating the temperature. The glass house, or the luminous palace, which it has been decided to build on the grounds of the 1900 Exposition, is now being constructed.

TITLES ON DRAWINGS.

IN the routine of the drawing-office the work of placing titles on tracings is a matter of considerable importance, and causes a great sacrifice of time when done by hand, no matter how expert the artist may be at either freehand or instrument work. This fact, taken in connection with the lack of uniformity in hand work, has led to devising schemes by which a title may be quickly printed on a drawing, and at the same time give a creditable appearance and also preserve a distinctly uniform style. All this is accomplished by means of movable type easily set in a frame, and while the results are not of the ornate order so dear to some draughtsmen, they are less costly and serve the purpose perfectly. In reply to an inquiry of Mr. F. M. Whyte, mechanical engineer of the Chicago and Northwestern Railway, for his practice in this line, Mr. Whyte writes as follows:

"In regard to the use of a printing-press for printing titles on tracings, we are using a small hand-press for this purpose, the frame of which measures 4in. by 6in. When it was first proposed to purchase a printing-press, the one we have was considered sufficiently large; but it has been remarked several times since that it would have been better had we purchased a larger one. The length of the frame given above limits the length of the title, but we find it large enough for the purpose, as we try to make the title as short and expressive as possible. We have three fonts of type, and you can judge of their size by the attached print. We find these sizes of type convenient and quite satisfactory. I might tell you our experience which practically drove us to the adoption of a hand-press. First, of course, it costs considerable to put titles on drawings, whether the work is done with the usual drawing instruments or by freehand. To reduce this cost, we tried first to use a rubber stamp, but the ink which we found would work satisfactorily with the rubber stamp would not give a print, so that, after putting the title on with the stamp, we would have to turn the tracing over and ink it on the back with black drawing-ink. This, of course, was no great improvement on putting the titles on by hand. We found we could not use black ink on the rubber-stamp, because the gasoline used for removal of the ink from the stamp after using it would destroy the rubber type. It was also difficult to get a perfect impression with the rubber stamp. The first difficulty experienced with the hand-press was that the ink would not dry fast enough after the title had been put on the tracing, but this trouble was overcome by using a light, fine powder to absorb the ink, so that we now take a print from the tracing immediately after titling it. Fine powder should be used, because, otherwise, the large flakes of coarse powder will overhang the edge of the letter and produce ragged edges. We use the ordinary quick-drying printers' ink for our press. The first cost for us was about £5 for the complete outfit, and it is believed that the first month or two's saving would cover that."



Y. X. & Z. RY.

CYLINDER, 18

PATTERN DRAWING

CHICAGO, ILL. JAN. 5, 1899.

APPROVED CORRECT

SUPT. M.P. MECH. ENGR. 4567

The style of letter and general appearance of this method of lettering may be noted from the example furnished, which is reproduced from the sample sent. It is not a work of art, but it is fitting for the purpose, and the practice indicates an intention to get the greatest possible value out of the drawing-office force.

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XI.

HAVING thoroughly investigated the general principles which govern the design and construction of cantilever bridges, and illustrated by numerous examples the prevailing types adopted by engineers for that particular class of structure, we must now pass on to those details which require a more minute, a more searching, and, at the same time, a more laborious investigation and analysis. It is not our intention to employ any of the branches of the higher mathematics in carrying out the computations and calculations necessary to impart to the bridge the requisite degree of strength and rigidity, and to render each member of it adequate to resist the stresses induced upon it. A fair acquaintance with the rules of algebra and trigonometry, of diagrams of tresses, polygons of forces, and of graphical statics will be assumed as a matter of course on the part of our readers.

It has been previously stated, and reasons given for the statement, that the central independent girder, resting at each end upon the extremities of the projecting cantilever arms, will be first considered and dealt with, as it is not affected to the least extent whatever by any of the loading upon the other parts of the bridge. It is subjected to the action of the dead weight upon itself and to that of the rolling or live load only while it is traversing it. The latter, as will be subsequently pointed out, can be replaced by an equivalent uniformly distributed load, a substitution which very much facilitates the calculations, and is quite sufficiently accurate for all practical purposes. Owing to the limited space at our disposal for diagrams and illustrations, it will be impossible to select as an example a cantilever bridge of even moderate dimensions. This unavoidable restriction will not in any degree affect the principle of the design or the type of truss or girder employed, nor the accuracy and integrity of the calculations of the loads and stresses upon the various members belonging to it. On the other hand, it will greatly facilitate the labour of the necessary computations, as the comparatively small span of the example selected and represented in Fig. 1 very considerably reduces the number of the separate component parts of the truss, and consequently the number of the resultant stresses to which they are subjected. In any case, it will be admitted that the simpler the example, especially when the chief object aimed at is to instruct, the better, provided always that it is sufficiently large and complete to embody all the leading principles and distinguishing characteristics which belong to the type of structure of which it is a copy. While neither time nor labour should be grudged when necessity requires them, we are no advocates for taking trouble purely for trouble's sake.

The illustration in Fig. 1, which is drawn to a scale of twenty feet to the inch, is the skeleton elevation of one of the central independent trusses for a cantilever bridge. It has a span of 91ft. and a depth of one-seventh the span, equal to 13ft. It may be mentioned here that in our calculations, for the sake of simplicity, and as no error worth mentioning is involved in the substitution, the value of the span will be taken at an even 90ft. Since there are seven panels in the truss, each panel is equal in length to the depth of it, which makes the angle between the diagonal members of the web and the lower flange of the truss equal to 45°, which in an economical point of view is about the best angle to adopt, although not perhaps the most pleasing in appearance. The total load, which is regarded as uniformly distributed over the lower flange, is always assumed to be placed at each intersection of the vertical and diagonal members of the web, and the flange, as represented in Fig. 1 by the equal weights W_1 W_2 . . . . W_6, each of which is equal to one-sixth of the total load; and their position shows that the truss is of the through type.

It will be noticed that Bows' system of lettering has been adhered to, the manifest superiority of which method has been previously pointed out and the key to its reading explained. It may, perhaps, be just remarked that the letter O indicates the whole of the space external to the upper boom and the terminal diagonals, while P signifies the space external to the lower flange. To render this explanation, which is of great importance, perfectly clear, it may be stated at the risk of a brief recapitulation that the end panel length of the lower flange at the left support is read as A P. The similar length of the upper flange will be B O, and the second diagram and vertical members from the right abutment will be represented by the letters L M and K L respectively. The dotted diagonal lines in the web of the truss are counterbraces, which are not required under the conditions obtaining with a load uniformly distributed, but must be inserted to provide for the action of a rolling road, which successively advances upon and recedes from the bridge. As the reason for the introduction of counterbraces in a few central spans is not so apparent as in the case of the main braces, it will be a fitting opportunity to refer to it more fully. With the loads W_1 . . . . . W_6 symmetrically arranged upon both sides of the centre of the truss, as in Fig. 1, there will be no stress upon the bars F*a* and G*a*, because the action of

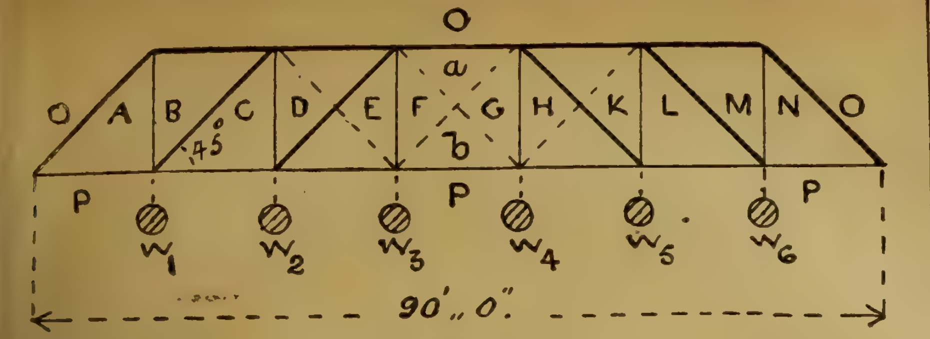


FIG. 1.

the weights upon the one half the girder upon these bars will be equal to that of the weights upon the other half, and as their directions and signs are opposite to one another they will neutralise or balance one another, and the bars themselves will be free from all stress. If now we take away some or all of the live weights upon one half of the truss, the balance becomes destroyed, and the stress upon the counterbraces will vary with the length of the longer of the loaded segments into which the span of the girder is divided.

The principle of counterbracing and the necessity for it will be readily apparent from a consideration of the skeleton elevation of the small Warren girder in Fig. 2. This example of truss was the prototype of all open web girders, and was originally built wholly of cast-iron, although that material was speedily replaced by wrought iron. It has long since been almost discarded, though it did good service in its time, after the mistake of the employment of cast-iron had been rectified. There are several old specimens of these girders to be seen carrying the South-Eastern Railway over Joiner-street, a side thoroughfare leading out of Tooley-street. Referring to Fig. 2, let the truss be supposed to be loaded with weights of equal amounts on the upper apices B, E F K—that is, covered with a uniformly distributed load, arranged symmetrically on both sides of the centre-line P P. These weights will give rise to stresses of compression and tension upon the upper and lower flanges and the diagonal members of the web of the girder, as indicated by the thick lines respectively in the figure. Under these conditions of loading there will be no stress upon the central bars of the web E D and F D, as will be evident if we analyse the action of the individual weights upon the apices in opposite directions. It will not be necessary, in order to thoroughly investigate this part of our subject, to refer to the stresses induced upon the flanges. but the diagonal bars will be alone dealt with, as they are quite sufficient for fully elucidating the problem. Commencing with that portion of the weight at B which, by the laws governing loaded structures, is transferred to the right abutment L, we find that in its passage it compresses the bars B C, E D, F H, and K L, and pulls upon or brings a stress of a tensile character upon the bars C E, D F, and H K. A point that should be noticed here is that this part of the weight at B brings stresses upon all the diagonal bars in the web situated between it and the centre of the truss, of a character the opposite of that to which they are exposed when the action of a uniformly distributed load is taken into account. Upon the diagonal bars belonging to the remaining or right-hand half of the girder the stresses induced are of the same character or sign as when they are under the conditions of a uniform loading. The part of the second weight at E compresses the bars E D, F H, and K L, and stretches D F and H K. If we now consider the other half of the girder and treat the weight at K and F with respect to the left-hand abutment, exactly as we have done with the weight at B in regard to the right abutment, it will be found that the stress upon each separate bar is of the same amount, but of an exactly opposite character to those produced by the weights on the left half of the truss. The comparison and summation of the different stresses will be best exemplified by tabulating them. It must be borne in mind that the character of the actual stress upon any diagonal bar will be the algebraical sum of the different stresses, whether they are plus or minus, or plus and minus. In Table I. the stress brought upon each bar of the web is given in the columns under the letters assigned to them in Fig. 2. The weights are taken equal to one ton each, so that counting from that at B, and putting R, R_1, R_2, and R_3, for the reaction of the weights at B, E, F, and K, we shall have—

$R = 0{\cdot}125.\quad R_1 = 0{\cdot}375.\quad R_2 = 0{\cdot}625.\quad R_3 = 0{\cdot}875,$

and for a check upon the calculation, the equation becomes—

$$2\,(R + R_1 + R_2 + R_3) = 4 \times W.$$

To determine the stresses upon the bars due to these separate reactions or vertical shearing stresses as they really are, the value of the angle which the diagonal bars in the web make with the horizontal flanges, must be known. Putting S to represent any required stress, and θ for the angle, then the different values of S are—

$$R \times \text{cosec.}\,\theta,\ R_1 \times \text{cosec.}\,\theta,\ R_2 \times \text{cosec.}\,\theta,\ R_3 \times \text{cosec.}\,\theta.$$

In Fig. 2, the value of θ is 60°, so that we can check the accuracy of the stress upon the last diagonal bar K L by the formula—

$$S = (R + R_1 + R_2 + R_3)\,\text{cosec.}\,\theta.$$

Making $\theta = 60°$, then—

$$S = 2\,W \times 2 = 4{\cdot}0.$$

the same result given in Table I. It should be noticed that reactions, and consequently the stresses upon the diagonal bars, follow the series of the odd numbers 1, 3, 5, and 7, so that having once obtained the stress that the weight at B brings upon each and all of the bars, those upon them induced by the other weights at the other apices are all multiples of the first.

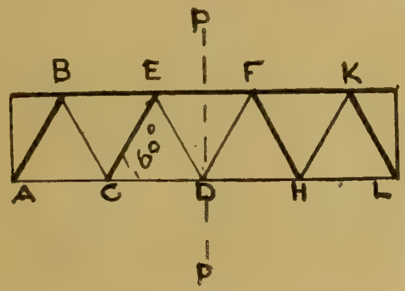


FIG. 2.

TABLE I.—DIAGONAL BARS.

Position of load.	A B	B C	C E	E D	D F	F H	H K	K L
B	—	+0·25	−0·25	+0·25	−0·25	+0·25	−0·25	+0·25
E	—	—	—	+0·75	−0·75	+0·75	−0·75	+0·75
F	—	—	—	—	—	+1·25	−1·25	+1·25
K	—	—	—	—	—	—	—	+1·75
Total	.....	+0·25	−0·25	+1·00	−1·00	+2·25	−2·25	+4·00

TABLE II.—DIAGONAL BARS.

Position of Load.	A B	B C	C E	E D	D F	F H	H K	K L
B	+1·75	—	—	—	—	—	—	—
E	+1·25	−1·25	+1·25	—	—	—	—	—
F	+0·75	−0·75	+0·75	−0·75	+0·75	—	—	—
K	+0·25	−0·25	+0·25	−0·25	+0·25	−0·25	+0·25	—
Total	+4·00	−2·25	+2·25	−1·00	+1·00	−0·25	+0·25	—

A summary and comparison of Tables I. and II. are given in Table III., and the algebraical sum and difference of the total stresses obtained by using each reaction separately gives the actual stress upon the diagonal bars under the conditions attending a uniformly distributed load. It will be seen from Table III. how the stresses in the two central bars E D and D F become equal to zero. It is also evident that passage of a live load subjects them to alternate stresses of tension and compression or "reversals," as they are frequently termed. These two bars, therefore, would have to be counterbraced, which in the girder shown in Fig. 2 would be accomplished by making them of such a section as would enable them to withstand both descriptions of stresses, and they would answer just the same purpose as the bars shown in dotted lines in Fig. 1.

TABLE III.—DIAGONAL BARS.

A B	B C	C E	E D	D F	F H	H K	K L
0·00 +4·00	+0·25 −2·25	−0·25 +2·25	+1·00 −1·00	−1·00 +1·00	+2·25 −0·25	−2·25 +0·25	+4·00 0·00
+4·00	−2·00	+2·00	0·00	0·00	+2·00	−2·00	+4·00

The vertical shearing stress at any point in a girder, whether of the solid plate or open-web type, is identical, and is found by the same rules. Let Fig. 3 represent a plate girder in elevation, of which L equals the span. It is required to find the vertical shearing stress at the point E F, placed at a distance Y from the centre of the girder A L, first when the girder is uniformly loaded, and secondly when it is under the action of a rolling or live load. In the first case it is an axiom that the shearing stress at any point of a girder is equal to the total weight situated between that point and the centre of the girder. Putting W for the weight per foot run on the girder, and S for the shearing stress, we obtain—

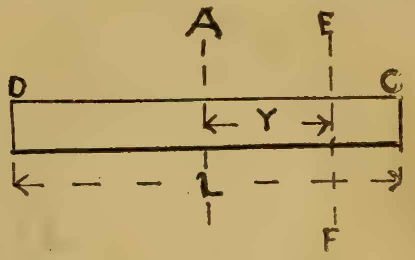


FIG. 3.

$$S = W \times Y.$$

It is not difficult to prove this statement. At each of the abutments the total shearing stress is equal to—

$$\frac{W \times L}{2}.$$

But the shearing stress of the line E F is evidently less than the total shearing stress at the abutment C, by the weight of that portion of load situated between it and the abutment C, which must accordingly be subtracted from the stress at the abutment to give that at E F. Now the weight of the load between the line E F and the abutment C equals—

$$W\left(\frac{L}{2} - Y\right)$$

So that the equation—

$$\frac{W \times L}{2} - W\left(\frac{L}{2} - Y\right)$$

represents the shearing stress at E F. Solving, we obtain, putting S as before for the stress at the line E F—

$$S = \frac{W \times L}{2} - W\left(\frac{L}{2} - Y\right) = W \times Y$$

as already found. In the second case, instead of the load being uniformly distributed, let it take the form of an ordinary railway train, which will successively cover the bridge in its passage across. When the live load has advanced from the abutment D to the distance of E F, so as to cover the whole of the larger segment of the girder, it is manifest the shearing-stress at E F will be a maximum, and since there is no weight to be subtracted from the calculation, owing to the fact that there is no rolling load between E F and the abutment C, so that the shearing-stress at E will be equal to the weight of the load upon the longer segment multiplied by the distance of its centre of gravity from E F and divided by twice L. This calculation may be put in a mathematical form as follows:—Let S_1 = shearing stress at E F, then the equation becomes—

$$S_1 = \frac{\left(\frac{L}{2} + Y\right)^2}{2L}$$

If we make—

$$A = \left(\frac{L}{2} + Y\right)$$

the formula may be simplified and—

$$S_1 = \frac{W \times A^2}{2L}$$

A very similar expression can be found for the shearing stress, when the rolling load covers the shorter segment of the girder. Putting this length equal to B, and S_2 for the shearing stress, we have—

$$S_2 = \frac{W \times B^2}{2L}$$

From either of these last two equations the shearing stresses at the abutments and at the centre of the girder can be easily ascertained. At the abutments A = B = L, and—

$$S = \frac{W}{2} \times L$$

Making S_3 = stress at centre, then $A = B = \frac{L}{2}$, and—

$$S_3 = \frac{W \times L}{8}$$

In the case of all open-web trussed girders, these shearing stresses must be multiplied by cosecant θ to give the actual stresses brought upon the diagonal members of the web. These principles will be applied in determining in our next article the stresses upon the central independent girder in Fig. 2, which belongs to the Howe type of truss.

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A NEW ARTIFICIAL STONE.

NUMEROUS and various are the processes which have been invented and patented both at home and abroad for the production and manufacture of artificial stone. Notwithstanding the multitude of them, new specimens are frequently, especially on the other side of the Atlantic, introduced to the public and placed on the market. Generally speaking, they may all be said to consist of an intimate mixture of sand, cinders, furnace slag, clinkers, stone chippings, and some descriptions of waste or by-products, with some material of a strong binding or adhesive nature, such as lime, cement, gypsum, soluble glass, and asphalte. Occasionally the aid of chemical saline solutions is called in, as in the case of chloride of calcium in the manufacture of Ransome's well-known patent stone, to complete the process, and form a powerful and durable cement to permanently maintain the thorough incorporation of the harder ingredients. The principal difference between all processes of this character consists in the method adopted to force the chloride of calcium or other chemical solution into the pores of the mass, so that they shall be exhaustively permeated by the indurating fluid. The more completely this part of the manufacture is effected, the more useful and durable will be the stone. It may be asked, What are briefly the principal qualities by which a good artificial stone should be distinguished? In the first place, it should possess a very high degree of cohesive power; secondly, it should be endowed with comparatively an enormous compressive strength; thirdly, it must be able to resist with impunity the destructive action of atmospheric agents; and, in addition to these attributes, it must not be of too flinty a character, or it will be both difficult and expensive to "tool" it. As a matter of course, *cæteris paribus*, its price must be something less than that of the natural stones for which it is intended to act as a substitute.

A new artificial stone has been lately introduced in Belgium, and patented by M. Hans Havenschild. The experiments undertaken with it have afforded results so satisfactory, that it will probably take its place among building materials. A short description of the new petrefaction and summary of the qualities it possesses, according to the recorded particulars of the experiments, will not, we think, prove uninteresting to our readers. The stone itself is of strongly hydrocalcareous composition, and consists of limestone chippings, *débris* of lime-kilns, and pieces of marble. These ingredients are all pulverised by machinery, until they are brought to the condition of a fine and almost impalpable powder, and in that state mixed with powdered slaked lime in the proportion of 80, or sometimes 90, parts by weight of crushed stone to 20 or 10 parts of lime. After being subjected to the action of what are simply powerful pugmills, and aided by the addition of a minimum quantity of water, the mixture is converted into a porous, semi-plastic mass, which, when consolidated by means of mechanical hydraulic presses, is readily moulded into any desired form. When the specimens are turned out from the moulds they are allowed a few days' leisure in the open to become well hardened, and are then fit for the hands of the stonemason to be cut and dressed to any shape required. In this respect the new artificial stone very satisfactorily fulfils one of the requirements we have enumerated as indispensable since it lends itself readily to the action of the hammer, the saw, and the chisel. There remains yet another phase in the preparation of the stones to be gone through before they are fit for the purposes for which they are intended. This consists in plunging them first into a bath of steam, and subsequently into one of carbonic acid. According to the size of the stones, the period of their immersion is more or less prolonged, so that when they are taken out they are thoroughly hardened, both internally and externally, and their cohesive property very materially increased. If a suitable consistency and size of grain be adopted for the original calcareous mixture, it is not a difficult matter to insure the production of a stone, which is susceptible of taking a very high polish, quite equal to that given to our Aberdeen and Peterhead granites. Similarly to all these artificial petrifactions, the new product increases in both tensile and compressive strength by age. When the specimens are fresh from the baths, the former is equal to 200, and the latter to 1,400lb. per square inch. Another week's induration augments these figures to 300 and 3,800lb. respectively, and the maximum results were as high as 600 and 4,300lb. per same unit, which, although not coming up to the standard of basalt, granite, and the heavier descriptions of limestones, is far in excess of whatever duty that the manufactured stone would have to fulfil.

T. C.

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TENANTS THEIR OWN LANDLORDS.

MR. W. P. HARTLEY, of Aintree, one of the suburbs of Liverpool, recently erected a street of about threescore houses for workpeople to acquire on easy terms, having observed the beneficial working of a scheme of the sort in Philadelphia. On Monday night he called a meeting of tenant-purchasers at the Aintree Institute to consider whether they would continue under the agreement into which they had entered, or approach the Liverpool City Council with a view to that body's taking over the enterprise under the provisions of Mr. Chamberlain's Small Houses (Acquisition of Ownership) Bill. It was decided to leave the matter over, so that it could be privately discussed, and a decision is to be given on September 6. The 60 houses erected by Mr. Hartley are on the two sides of a street (Cedar-road), which is 70ft. wide between the walls. The roadway is 20ft., each side walk 10ft. wide, and the gardens in front of the houses are 15ft. long. The cost of erection varied from £275 to £370 per house, and the terms of purchase vary in proportion. In a £275 house there is a sitting-room, kitchen with modern range, scullery, pantry, three bedrooms, small bath-room, with hot and cold water, and coalhouse and water-closet outside, but under cover. A patent cone boiler in the scullery prevents steam from escaping into the remainder of the house. A £370 house contains a front sitting-room, dining-room, kitchen, scullery, pantry, and outhouses under cover, while upstairs are three bedrooms, bath, and watercloset, and double attic bedroom. In all cases there are gardens at the back as well as the front, while Mr. Hartley has reserved a plot of 3,200 square yards as a recreation ground for the colony. The tenant has to pay for ground-rent about £2 6s. a year, besides repairs and rates, and he pays off the principal at the rate of 3¾ per cent. per annum, or £9 6s. 3d. in the case of a £275 house. He also pays interest at the rate of 3¾ per cent. For the first year there is a total of £18 12s. 6d., but the interest will diminish as the principal is paid off, and in 18 years the house becomes the tenant's own property. If compelled to remove, the tenant may sell his interest or have the principal he has paid refunded, less ¼ per cent. per annum for depreciation. A tenant may, if he likes, buy the freehold, which is held by Mr. Hartley. Though the houses are near Mr. Hartley's factory, none of them are occupied by his workpeople. The tenant-purchasers comprise commercial travellers, clerks, schoolmasters, engine-drivers, engineers, stewards, &c. Mr. Hartley has altogether some 200 acres of land available for extending his colony if desirable.

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CHIPS.

At Leicester a cemetery and an isolated hospital are being provided by the corporation on a portion of the Gilroe Estate, some 178 acres in extent. Thirty acres are being laid out as a cemetery at a cost, including buildings and boundary walls, of £26,000. Messrs. Goddard and Co., of Leicester, are the architects. The isolation hospital, for which Messrs. Blackwell and Thompson are the architects, will cost £54,000.

The urban district council of Usk have petitioned the Board of Agriculture for sanction to provide a cattle market for the town at an estimated cost of £3,000.

It is expected that the Banbury branch of the Great Central Railway will be open for goods traffic by November. This new line runs from the main line of the Great Central to the Great Western at Banbury, and is about eight miles in length.

The Presbyterian Church at Greystones, on the Ulster coast, was reopened last week after enlargement by transepts, providing 120 sittings, and the addition of a session-room to the school. Messrs. Young and Mackenzie, of Belfast, were the architects.

The John Rylands Memorial Library at Manchester, the erection of which was begun nine years ago, will be formally opened in October. The architect is Mr. Basil Champneys, B.A. Mrs. Rylands purchased the Althorp Collection in 1892, and she has added thereto a considerable number of volumes, making up a total of about 65,000.

Designs for new premises at Bombay for the Chartered Bank of India, Australia. China, and Bombay, have been prepared by Mr. F. W. Stevens, C.I.E., F.R.I.B.A., and have been approved by the Government. The style adopted is Classic-Renaissance. The site, which is a prominent one, was purchased from Government some time ago, and is opposite the Queen's Statue on the Esplanade between the Scotch High School and the Oriental Life Assurance Building. The cost of the building will be about 4¾ lakhs of rupees.

Active operations in connection with the erection of the new episcopal residence for the Bishop of Bristol have been commenced on a site presented by Mr. W. H. Greville Edwards, at Redland Green. The builders are Messrs. Stephens and Bastow, of Bristol, whose tender was accepted from among those of seventeen other firms who were invited to compete. The building has been designed by Mr. W. D. Caröe.

Some little time ago, want of room being experienced in the Primitive Methodist Chapel, Raunds, for the congregation and Sunday-school combined, an enlargement was determined upon, at a cost of about 300. On Monday week there was a memorial stone-laying service.

The work of underpinning the church tower at Steeple Gidding is being satisfactorily carried on. The new foundation of concrete and brickwork has been laid some 18in. deeper than the original foundation.

It is proposed to erect a new Secondary School at Sleaford, from plans by Mr. Jesse Clare, the architect to the Governors of Carr's Grammar School.

The Ipswich Corporation have decided to carry out an important scheme of widening in Falcon-street and St. Nicholas-street, in continuation of an experiment already effected in the latter thoroughfare, the estimated cost of the present works being £11,500.

The Wigton Rural Council have decided to join with the Aspatria and Holme Cultram Councils in payment of the preliminary cost of surveying the several districts proposed to be supplied with water from Overwater, a small lake near Ireby, fourteen miles from Thirlmere. The idea prevailed that Kirkbride, Bowness, and other low-lying districts of the Wigton Union should be included in the scheme.

The "leaning tower" attached to the interesting old church of Wendlebury, dating from quite 600 years ago, and familiar to travellers along the high road from Oxford to Bicester, is to be pulled down. The "leaning" in this case is a matter of subsidence, not design.

BOOKS RECEIVED.

A Handbook for Travellers in Somerset, with maps and plans. (London: John Murray.)—This fifth edition of a recognised handbook is now published in a separate volume, and no longer includes Wilts and Dorset. The work has been thoroughly revised and brought up to date. The cities of Wells, Bath, and Bristol are amply dealt with. Maps of Bath and Bristol, of Wells, with plans of the Cathedrals of these cities, and of St. Mary Redcliffe Church, maps of the country between Taunton and Yeovil, of the north coast of Somerset, and a general map of the county in pocket of binding are to a good scale, and the routes and objects of interest, the architecture and churches, antiquities, physical features, and geology are fully described. As a tourist's handbook to a favourite part of the country, nothing better can be desired.——*The Agricultural Surveyor and Estate Agent's Handbook*, by Tom Bright (London: Crosby Lockwood and Son, 7s. 6d.), will be found very useful. It is, of course, largely a compilation; but the author has selected wisely, and condensed judiciously; and the result is a portable and reliable manual, in which accuracy has been one of the principal aims. Especially useful are the particulars and estimates relating to the equipment of farms. It is surprising, on some estates, how the cheaper materials and methods of construction now available are ignored by agricultural surveyors, &c. ——*Textbook on Practical Geometry:* Class Sheets to be used in conjunction to prepare Candidates for the Examinations of the Department of Science and Art, &c., by the late John S. Rawle, F.S.A. (London: Simpkin, Marshall, Hamilton, Kent, and Co., Ltd.). These publications will afford students of this subject a valuable aid. The author was well known as the writer of a Practical Plane and Solid Geometry, which has gone through fifteen editions, and is approved as a textbook by the Department of Science and Art, the Board of Intermediate Education, Ireland, and the London School Board. We have noticed earlier editions of this very complete and condensed textbook, containing all the necessary problems in each branch, besides many special methods of constructing polygons and other figures. The exercises in scales and scale-drawing and geometrical pattern drawing are exceedingly useful for students in architecture and decorative design. Mr. Rawle was an experienced instructor and examiner on this subject, and his textbook combines the advantages of conciseness and clearness. There is no better textbook on Practical Geometry. The Class Sheets, to be used in connection, which has passed through eight editions, 40th thousand, consist of ten sheets of numerous diagrams, printed on both sides, with enunciations and spaces to work out the problems. These Class Sheets greatly facilitate class-teaching, and the set is only one shilling. Thus Class Sheet 3, divided into eleven compartments or spaces, enunciates several problems, how to construct plain scales of 1in. to 1ft., 1in. to 5ft., 1in. to 3ft., 20 yards to an inch, each subdivided to show feet in inches and yards. Another shows how enlarged copies are made to certain scales; the remainder of the problems show the construction of isosceles triangles with the base, and angle or altitude and base are given, to find the centre of a triangle. Various other problems on the construction of triangles, where certain sides and angles are given, the construction of rectangles, the lengths of two adjacent sides or diagonals are given. Other sheets show how to construct a rhombus or trapezium. To find the centre of a circle, to describe through three points, the construction of regular polygons, how to draw tangents to circles, to divide lines into parts, how to inscribe figures in triangles, to describe ellipses, and there are several exercises in solid geometry. These are all well-selected and constructive problems, intended to test the student's knowledge of geometry. The diagrams are clear and well printed.——*Practical Geometry Test-Papers*, 6th edition, by the same author, can also be used in conjunction with the Textbook and Class Sheets. Each set of six papers, printed on both sides with diagrams, are intended as test problems in plane and solid geometry, and to test the student's proficiency at intervals. ——*Freehand Drawing Test Papers* (second grade), price 1s. These sheets are intended to use in class teaching. Printed directions accompany the diagrams of construction on each sheet. On one side of each sheet is the example to enlarge or reduce, and on the right-hand side of the sheet is the space for the copy, with one side of enlarged boundary given. The sheet will be found very useful to students in schools of art, art classes, &c. The directions printed at the bottom of each example show what constructional lines should be first drawn, and how the distances of certain points (say of a vase) are marked off. One of the examples given is a honeysuckle ornament. We can strongly recommend all students of geometry and freehand drawing to obtain Mr. Rawle's publications—as class and test-papers they are invaluable.

OBITUARY.

Mr. William Simpson, R.I., one of the first of the Special Artist Correspondents of the London illustrated Press, died on Thursday in last week at his residence, Church-road, Willesden, in the 76th year of his age. During the war with Russia he was sent out to the Crimea by Messrs. Colnaghi, the fine-art publishers of Pall Mall, for the purpose of making a series of illustrations of the war. Upon his return from the East, Mr. Simpson published two volumes of sketches, under the title of "Campaign in the East," and was honoured with a private audience by her Majesty, who gave him instructions to paint for her pictures of the troops as they returned from the seat of war. He travelled in India from 1859 to 1862, during which period he visited Kashmir and Tibet, making numerous sketches for a series of water-colour illustrations of "India, Ancient and Modern," published in 1867, for the *Illustrated London News*, and two years after went out to Abyssinia with the Expedition under Sir Robert Napier, and in 1870, upon the breaking out of the Franco-German War, was attached to the French Army. He was in Paris during the Commune, and a little later, in 1871-72, was in Pekin attending the marriage of the Emperor of China. From Pekin he visited the Great Wall, and afterwards followed the Modoc Indian War in California. He accompanied the Prince of Wales in 1875-6 on his visit to India, and upon the breaking out of the Afghan War in the autumn of 1878 was attached to Sir Samuel Browne's force through the Khyber Pass. He remained with the force at Jellalabad and Gundamunk, where he carried out a series of archæological investigations for the Viceroy, Lord Lytton. In 1883 he attended the coronation at Moscow of Alexander III., whose wedding he had illustrated 17 years previously; and in 1884-5 again visited India in company with the Afghan Boundary Commission in their mission to delimit the North-western Boundary of Afghanistan. Mr. Simpson had been since 1880 an honorary associate of the Royal Institute of British Architects, before which body he read several papers of much interest and literary merit on archæological subjects connected with India, and was a Fellow of several learned societies.

CHIPS.

The gas committee of the Mossley Corporation have appointed Mr. H. J. Robinson, of Stockport, as gas manager. There were 55 applications for the post.

Professor Smith, President of the Royal Institute of Public health, has written to Dr. Robertson, convener of the Public Health Committee of the Aberdeen Town Council, stating that the council of the institute accept with pleasure the invitation of the corporation to hold their conference in 1900 in Aberdeen.

Alterations are being made at the board-room, London Salvage Corps, from the designs of Mr. William Wimble, London, and special attention has been given to the ventilation, which will be carried out on the Boyle system.

Mr. L. W. Darra Mair, M.D., one of the inspectors of the Local Government Board, held an inquiry at the Guildhall, Lincoln, on Tuesday, into an application of the urban sanitary authority for power to borrow £1,167 for the purchase of a site for a hospital for infectious diseases.

The Dublin Corporation decided, on Monday, to instruct the public health committee to prepare a scheme setting forth the best way of dealing with the housing of the working classes, so that the poor might be better housed, the slums cleansed and put in order or closed, and the health and wellbeing of the citizens safeguarded. There was, it was said during the discussion, nothing worse in any country than the condition of the slums of Dublin.

Mr. John H. Whitaker, a well-known builder and contractor, of Shipley, who was associated with the firm of Messrs. S. Deacon and Co., of Shipley, near Leeds, died at his residence in Birksland-road, Shipley, on Tuesday.

Building Intelligence.

Ayrshire.—Dumfries House, built about the year 1760 by William, fourth Earl of Dumfries, remained much as it was then until a year ago the present Marquis of Bute added a wing to it, and is about to add another, the contracts for which have just been let, the architect being, as before, Mr. Schultz, Edinburgh. The stones are to come from the quarry at Old Coalburn, New Cumnock, which is on Lord Bute's estate. When the old house was built masons and wrights were paid 1s. per day, and labourers 8d. Masons and wrights are now being paid eight times more, and labourers five times as much, while in 1760 they wrought a much longer day than they do now.

Bristol.—The All Saints Almshouse in St. James's Barton has been completed, and the inmates have removed into the new building from their temporary home in King-square. The Bristol United Breweries, Ltd., requiring the site of the almshouse in Rupert-street for the extension of their premises, arranged with the All Saints' Feoffees to purchase a site and build another almshouse in St. James's Barton, and, pending the carrying out of the work, a house was taken in King-square for the accommodation of the eight inmates. The new building has been erected by Mr. A. J. Beaven, of Bristol, from the designs of Mr. T. Scammell, architect, of St. Stephen's-street. It is Gothic in design, the front elevation being of Cattybrook bricks with Bath stone facings, and the roof covered with dun-coloured tiles. The ground floor comprises entrance-hall, two living-rooms, and two sculleries, with lobby and covered way to a general washhouse. There is a large garden at the back with asphalte paths, and an old vinery has been retained for the use of the inmates in wet weather. On the first floor there are three living-rooms, with sculleries and other offices, and similar accommodation is provided on the second floor.

Felixstowe.—The foundation-stone of a new Presbyterian church was laid on Monday week. The building stands at the corner of Orwell and Tomline roads, there being enough extra space to provide at a future period a schoolroom and a manse. The exterior of the church will be faced with grey Kentish rag-stone, with dressings of Bath stone. Mr. George W. Leighton, of Ipswich and Felixstowe, is the architect. The roof is to be supported by moulded hammer-beam principals, with plaster in the spaces between the rafters. Above the vestibule will be placed a gallery, divided from the rest of the church by an arch. The pulpit end of the church will terminate in a short chancel. Oak benches will fill the interior, seating accommodation being for 450. The estimated cost of the edifice is £3,300, the contractor is Mr. F. C. Thurman, Walton, and the mason Mr. Thomas Strong, who belongs to a family who have carried out this kind of work ever since the building of St. Paul's Cathedral.

Southampton Buildings, W.C.—The rebuilding of the Patent Office is going forward, and the new premises are to be opened in January, 1901. The new building, which has been designed in the offices of H.M. Board of Works, consists of a block 130ft. long by 30ft. wide, three stories and an attic floor in height, facing Southampton Buildings, and devoted to offices; a second wing of offices, 110ft. by 30ft., running nearly at right angles to the other from the western extremity to an entrance in Quality-court, Chancery-lane; and behind and between these a library nearly 140ft. by 60ft., provided with two tiers of side and end galleries, carried on fluted cast-iron columns, with Corinthian capitals. This library will be approached by an elliptical vestibule 57ft. by 19ft. in the clear. The floors of this vestibule, the entrance-hall, and the grand staircase well will be of mosaics; that of the library and other parts will be of wood blocks. The block facing Southampton Buildings will be faced with Portland stone and white bricks, the remaining portions being of ordinary bricks, saving in the back faces of all parts of the building, which will be entirely of white glazed bricks. The main contract was let to Messrs. Perry and Co., of Bow, for £43,581, but this sum does not include anything for heating, wood-block floors, fittings, lighting, plastering, &c. The bulk of the wood finishing in the skirting, entrances, &c., will be of oak. The buildings throughout will be fireproofed—in the library, galleries, and ground floor, by Messrs. Homan and Rodgers, with their ordinary concrete and steel construction, and in the remaining portions of the buildings by the contractors, Messrs. Perry and Co.

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CHIPS.

The school board of the parish of St. Ninians opened a new school at Bannockburn last week. The school has been erected at a cost of £3,400, and has accommodation for 368 scholars. Mr. Ronald Walker is the architect.

The Leeds Corporation have not yet been able to acquire all the properties they need in the York-street area for the clearing away of the slums in that neighbourhood. Thirty-nine owners have still failed to come to terms. To hear the claims of these gentlemen and to fix the prices to be paid by the corporation for the properties, Sir Hugh Owen, G.C.B., who has been appointed arbitrator by the Local Government Board, will conduct a series of inquiries at the Town-hall towards the end of September. The proceedings will probably last three weeks or a month.

At a meeting of the Mersey Dock and Harbour Board last week the Works Committee reported that they had accepted tenders for the construction of a powerful side ladder dredger and three steam hopper barges, at a total cost of £89,620. The successful tenders are—for the dredger, Fleming and Ferguson (Limited), Paisley; and for the three hopper barges, William Simons and Company (Limited), Renfrew. The additional dredging and carrying plant had been rendered necessary by the extensive new dock works.

The work of restoring the parish church of Hollingbourne is proceeding. The nave roof is now completed, and the aisle roofs are in process of repair. The work is being carried out by Messrs. Pryer and Co., who are also restoring Wormshill Church.

Mr. Bracken, chairman of the Templemore Urban Council, has been obliged to resign his position, being a road contractor to the council. According to a Cork correspondent, he had to pay a fine at petty sessions for acting as chairman and contractor at the same time. The members of the council co-opted his wife and elected her to the chair, and in that position she conducted the business.

At the Pontefract Town Hall last week, Mr. W. A. Ducat, Local Government Board inspector, held an inquiry into an application by the corporation to borrow £4,000 for the purchase and adaptation of the Headlands House estate, comprising three acres of land and a gentleman's residence, for the purpose of public offices, depot, stables, and market. The borough surveyor (Mr. Oddy) spoke of the want of accommodation in his department, and consequent waste of time. The inspector visited the site.

At the monthly meeting of the Lymington Rural District Council, the other day, it was decided to agree to the alterations made by the Local Government Board in the proposed set of by-laws for the regulations of buildings and sewerage works in the rural district, and by resolution the new by-laws were unanimously adopted.

Col. W. R. Slacke, a Local Government Board inspector, held an inquiry in the town-hall, Blackpool, last week, into the application for power to borrow £13,000 for street improvement purposes and £6,000 for the erection of a new fire-engine station. There was no opposition.

At Nuneaton, Mr. H. Percy Boulnois, M.I.C.E., held a Local Government Board inquiry on the 16th inst. into an application made by the Nuneaton and Chilvers Coton Urban District Council for permission to borrow £26,060 for purposes of sewerage and sewage disposal, and the purchase and adaptation of a site for a town-hall, and other public improvements. It is proposed to construct the new sewage works at Mancetter, in the Atherstone Rural District Council area, and this was opposed by that authority, by the Ansley, Hartshill, Mancetter, and Witherley Parish Councils, and by a local landowner.

Mr. Charles Perrin, an inspector under the Local Government Board, held an inquiry at the Council House, Bristol, into a scheme for providing new dwellings for persons of the labouring classes. The proposal forms a part of the large scheme of street improvement which was contained in the Provisional Order of 1895, which included Wine-street and other important undertakings. Under the scheme the council propose to acquire a number of houses occupied by the labouring classes, and the Act requires them to provide accommodation for those who will be displaced. The proposal provides for the erection by the corporation of a number of labourers' dwellings at Chapel-street, St. Philip's Marsh, Bragg's-lane, St. Philip's, and Millpond-street, Mina-road.

PROFESSIONAL AND TRADE SOCIETIES.

The Society of Architects.—At the last ordinary meeting of this Society, held at St. James's Hall, Piccadilly, W., Mr. Silvanus Trevail, vice-president, in the chair, the following seven candidates for membership were balloted for and declared duly elected:—H. Curzon, 50, Woburn-place, Russell-square, W.C.; H. W. Dobb, London Wall, E.C.; J. J. Freeland, 17, Franconia-road, Elms Park, Clapham, S.W.; A. T. Hussell, Market-square, Ilfracombe; H. W. Leicester, 49, Finsbury-terrace, Swansea; Walter Slater, 9, High-street, Wrexham; and H. W. Weir, 32, Greenclose-road, Ilfracombe. Eleven nominations for membership were read, and various donations to the Society's library were announced and acknowledged with thanks. It was stated that the next qualifying examination will take place on Wednesday, Thursday, and Friday, October 11th, 12th, and 13, 1899, the latest date for entering being September 20.

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Brixham Wesleyan Chapel, opened in 1816, was reopened on Friday after renovation and enlargement. A room at the rear has been taken in, a new gallery constructed, and the rostrum and organ placed further back. All the old straight-back seats have been abolished, and the modern seats of pitch-pine substituted. The premises, both inside and outside have been renovated, and hot-water heating apparatus has been installed. Extra exits have also been provided, with a new staircase to the gallery. The contractor (Mr. R. F. Yeo, of Torquay) has carried out the work from plans prepared by Mr. W. G. Couldry, architect, of Paignton. The total cost, including the re-erection of the organ, has been upwards of £1,000.

Whilst removing the old lead flat round the base of the spire of St. Cuthbert's Church, Darlington, preparatory to repairs, there has been uncovered an incised foliated 13th-century child's grave-cover, measuring 2ft. 9in. in length by 13½in. wide at one end, tapering to 10in. wide at the other, and also remains of another grave-cover of the same date measuring 18in. across the foliation. These two stones had been used to fill up the north-east squinch of the tower.

At the town-hall, Stratford, E., Inspector Charles Perrin, M.Inst.C.E., on behalf of the Local Government Board, has conducted an inquiry into the application of the West Ham Town Council for sanction to borrow £8,472 for street improvements, including £5,750 for replacing the paving in various streets after the laying of the electric light mains, £2,400 for the purposes of the Canning Town Depot, £500 for sewage works, and £253 for public walks and pleasure-grounds at Russell-street, Plaistow.

Most of the brickyards at Fletton, Yaxley, and Farcet have, says the *Peterborough Advertiser*, larger quantities of bricks stacked than has been known for a long time in the industry. The demand just now is not quite so large as the supply. There has been a falling off for some weeks. This, in spite of the fact that building all over the country is proceeding rapidly. The lull is, of course, only quite temporary. Of course the local demand is an insignificant detail. London still claims the largest quantities. To Hornsey, Harringay, Highgate, Muswell Hill, and Wood Green large quantities are despatched.

At the Burnley Bankruptcy-court, on Saturday, application was made for the discharge of Thomas Henry Lomas, Holme-road, Burnley, confectioner, and formerly carrying on business as a builder at Earby, but the discharge was suspended for four years.

The next Winter Exhibition at the Royal Academy will consist exclusively of works by Vandyck.

Alderman Christopher Miskin, builder, of St. Alban's, took the customary oath and his seat upon the magisterial bench at the City Sessions on Thursday in last week. Mr. Miskin has been a member of the corporation of St. Alban's since 1882, and served as mayor in the year 1885-6.

Arrangements have now been made and plans are in course of preparation for the creation of a new Court at the Royal Courts of Justice for the use of the additional Judge of the Chancery Division, who will shortly be appointed. It was at one time thought it would be necessary to go outside the building for the purpose; but space has now been found available for the erection of a large and commodious court within the Royal Courts of Justice. The work will be begun very shortly.

To-morrow (Saturday) Sir Michael Hicks-Beach, M.P., and Lord Castlereagh will lay the foundation-stones of new docks at Seaham Harbour, and on the same day Viscount Castlereagh and the Marchioness of Londonderry will cut the first sods of two new collieries at Seaham.

WATER SUPPLY AND SANITARY MATTERS.

Hendon, N.W.—Mr. W. O. E. Meade-King, M.Inst.C.E., an inspector of the Local Government Board, held an inquiry on the 6th inst. at the public offices, The Burroughs, Hendon, into an application of the urban district council for sanction to borrow £4,713 for sewering The Hale, &c., and £3,099 for private street improvement works, &c. Mr. S. Slater Grimley, the engineer and surveyor to the council, gave evidence in support of the application, and explained that about twenty miles of sewers have already been designed and carried out under his direction, the outfall works having been entirely remodelled by him at a cost of about £50,000 altogether, bringing up the total amount spent on sewerage by the urban authority since 1887 to about £130,000 and on private street and other works to about £45,000. The system of treatment at the outfall works is:—(1) Chemical precipitation; (2) clarification through sand and burnt ballast filters; (3) bacteria filtration and land. The cost is about £1,200 per annum, and the resulting effluent satisfactory. The population draining to the works is at present about 17,000. The inspector, after visiting the outfall works and The Hale, promised to report in due course.

Shrewsbury.—The Corporation of Shrewsbury have received, and will consider in committee, a report from Messrs. Taylor, Son, and Santo Crimp, of Great George-street, Westminster, on the water-supply problem. The engineers recommended that water can be obtained from Blatchcott Upland, on the Long Mynd ridge, at an estimated cost of £127,000. The scheme provides for 5½ miles of 10in. main from Blatchcott Upland to Lyth Hill, where filters and a storage reservoir can be constructed, and other four miles of 15in. main from the reservoir to the borough. The population to be supplied is at present under 30,000.

Snowdonian Water for Anglesey.—Mr. R. G. Thomas, M.S.A., architect and surveyor, chairman of the Menai Bridge District Council, has mooted a bold scheme for supplying Anglesey with water. The supply of the towns and villages of the island is by no means first rate. Holyhead, Llangefni, Beaumaris, and Menai Bridge have in dry weather to be most economical in the use of water. In addition to the towns named, a large number of new watering-places are rapidly springing into existence round the coast, and the available sources of water in the county are few and far between. Mr. Thomas's idea is that a joint water supply authority should be created, which should include the Anglesey County and other Councils, and also the local councils on the line of route of the pipe-line in Carnarvonshire, for the purpose of obtaining possession of one large or a number of smaller lakes in the Snowdon Mountains above Llanberis, and conduct their waters by a great main, which would have to pass under the Menai Straits to some central reservoir in Anglesey, thence to be distributed to the various towns and villages in the island. Mr. Thomas has personally examined the upper lakes of the district, and has obtained particulars of two or three at a height of 1,200ft. to 1,600ft. above sea-level which could be utilised as sources of supply. With regard to the crossing of the Menai Straits, Mr. Thomas thinks this would have to be done under the sea, as it is doubtful if permission could be obtained from the Government to lay the mains along the Menai Suspension Bridge, or from the London and North-Western Railway Company to carry them over the Britannia Tubular Bridge. If, however, such permission could be obtained, it would be preferable to carry the pipe-line across the Straits by means of one or other of the two long bridges named. Mr. Thomas, at a rough estimate, thinks that a sum of £300,000 would be amply sufficient to carry it out in full detail, and this sum would be a comparatively small matter when apportioned between the numerous governing bodies in Mr. Thomas's draft suggestion. These include, in addition to those named, the local governing bodies of Dinorwic, Ebenezer, Bethel, and Portdinorwic, all on the Carnarvonshire side of the Straits, and all in the line of route, and all of whom would be greatly benefited by such a source of water supply. These latter districts would, of course, require to have a central reservoir of their own, in addition to the great central reservoir in Anglesey.

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The foundation-stone of the new church in Warwick-road, Carlisle, is to be laid on Wednesday, Sept. 8, by the Duke of Devonshire, who will be accompanied by the Duchess.

The Glasow United Trades Council, Mr. R. C. Robertson, president, in the chair, have made a grant to enable the Scottish Painters' Society of that city to obtain a revision in the Court of Session of a decision by Sheriff Spens that a ladder could not be regarded as a scaffolding under the Workmen's Compensation Act, and that, consequently, a workman injured by falling from a ladder was not entitled to compensation.

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ILLUSTRATIONS.

ELY CATHEDRAL.—ST. OLAVE'S UNION, LADYWELL.—NEW TOWN HALL, CLITHEROE.—RESIDENTIAL BUILDINGS AT BEXHILL.—"THE COTTAGE," KINGSBURY.—CHURCH AT BRETTEVILLE, NORREY.

Our Illustrations.

SKETCHES OF ELY CATHEDRAL: NATIONAL GOLD MEDAL DRAWINGS.*

THESE charming studies by Mr. George Marples, of the Royal College of Art, represent some well-known features of the famous cathedral at Ely, of which, as will be seen by the footnote references, a large number of illustrations have appeared in our pages from time to time. The author of the accompanying drawings was last year awarded a National Gold Medal for his "Studies of Architectural Detail," and these three sheets belong to that series, which was an exceptionally good one. The subjects were well chosen and excellently rendered, so that our readers will be glad to have the reproductions thus placed before them.

ST. OLAVE'S UNION WORKHOUSE, LADYWELL.

THESE buildings are now in course of erection on a site known as Slagrave Farm, Ladywell, for the Guardians of the St. Olave's Union. The buildings are to accommodate about 800 people, being apportioned for 336 aged and infirm inmates, 348 healthy infirm, small dormitories for 90, and married couples' quarters for 24 inmates. On the left-hand side of the entrance-gates off the main road are placed the porters' lodge, stables, and mortuary; and on the right the receiving block for males and females, having the clothes store, attendants' rooms, &c., on the first floor. In the centre of the main buildings is placed the administrative block, in the front of which are the committee rooms and offices, waiting-rooms, and medical officers' and superintendents' houses, together with the necessary offices; and in the centre of the block are the dining-hall, kitchen, scullery, workrooms, matron's office, stores, and officer's quarters; and at the back the laundry, engine and boiler house, workshops, bakery, flour store, coals, and water-tower. Upon each side of the adminstrative block, and connected by covered corridors, are the blocks for male and female inmates, with the necessary day-rooms, dormitories, attendants' rooms, bath-rooms, lavatories, and offices. On the right-hand side of the water-tower is placed the isolation block for 10 beds. It is intended to erect at the extreme ends and at the back of the buildings two chapels to accommodate 350 persons. The buildings are being carried out in stocks, with red brick and stone dressings, at a cost of £164,850, by Mr. Charles Hall, of Chelsea, from the plans and under the superintendence of Messrs. Newman and Newman, architects. Mr. Durston is acting as clerk of works.

NEW TOWN HALL AND FREE LIRBARY, CLITHEROE.

THE new building will be erected on the site of the present town hall and free library, together with extra land purchased for the purpose, and will consist of basement floor, containing weaving, plumbing, carpentry and joinery, cookery, agricultural, store-rooms, and latrines, &c. The ground floor comprises separate entrance and offices and grand staircase for the town-hall department, and separate entrance to the library, which will consist of large lending library and news and reading room, librarian's room, &c. The first floor will include a large council-chamber, mayor's parlour, and retiring-room, ante- and cloak-rooms for members, town clerk's office, and committee-rooms. The top floor is to be devoted to technical school purposes, until such time as the town requires the extra office accommodation. There will be a very spacious staircase from the ground floor to the second floor level. The new building will be in dressed stonework throughout, and it is designed in the Renaissance style. The total cost is estimated at about £13,000. The architects are Messrs. Briggs and Wolstenholm, of Blackburn and Liverpool. The site of the new town-hall overlooks the castle keep, which is the only portion now remaining, and is supposed to have been built by Robert de Laci, Lord of Blackburnshire, in the reign of Rufus, and is now vested in the trustees of the late Duke of Buccleuch.

RESIDENTIAL BUILDINGS, ETC., BEXHILL.

THIS building is designed for erection on a triangular site adjoining the Marina, Bexhill. It comprises, on the ground floor, shops facing the sea and the Marina, and the kitchen, stores, boilers, engines, &c. The building is lighted by central areas; on the first (and principal) floor are spacious drawing, dining, smoking, and billiard rooms, and seventy-five bed and sitting rooms, with all the usual offices, &c. The entrance-hall and lounge, which are on this floor, and approached by means of a short flight of steps, form a terrace at the east end of the buildings. The whole will be executed in brickwork, with red facings and terracotta architraves, cornices, &c. The architects are Mr. Edward White and Mr. G. Godfrey Page, of Gray's Inn, W.C.

"THE COTTAGE," KINGSBURY.

"THE Cottage," Kingsbury, is now nearing completion. Externally, the ground-floor is of red brick; the upper part of main fronts seen in the sketch is in half-timber work in oak, the remainder of upper parts being in rough cast. The windows and external woodwork are in oak. The interior is cottage-like in style, although in many ways it will be exceptional. The floors of principal rooms and lounge, also the staircase, are in oak. The doors are mahogany with "electro" furniture. The fireplaces throughout are carried out, as also the walls of bath-room and lavatory, in quaint old Dutch tiles. The walls of kitchen and offices are lined with "Crystopal" tiling. The work is being carried out by Messrs. J. Norris and Sons, of Sunningdale, under the superintendence of Mr. W. West Neve, of Bloomsbury-square, London, architect.

CHURCH AT BRETTEVILLE, NORREY.

THIS well-known church, of which we publish two sketches, stands in the small village of Norrey, about seven miles north-west of Caen. Built in the Early Gothic period, its size and elegant proportions almost entitle it to be considered a cathedral. It has a fine spire and open belfry, and a most interesting north porch. Internally, there is some beautiful carving of quaint design. Externally, on either side of the chancel wall, rise two colombiers, or pigeon-houses, the existence of which seems to indicate that this church originally belonged to the Abbey of Ardenne. These sketches are by Mr. Charles E. Varndell.

COMPETITIONS.

THE "OWEN JONES" PRIZE.—This competition was instituted in 1878 by the Council of the Society of Arts, as trustees for a sum of £400, presented to them by the Owen Jones Memorial Committee, being the balance of subscriptions to that fund, upon condition of their expending the interest thereof in prizes to "Students of the School of Art who, in annual competition, produce the best designs for household furniture, carpets, wall-papers and hangings, damask, and chintzes, &c., regulated by the principles laid down by Owen Jones." The prizes are awarded on the annual competition of the Science and Art Department. Six prizes were offered for competition in the present year, each prize consisting of a bound copy of Owen Jones's "Principles of Design," and a bronze medal. The following is a list of successful candidates:—Edith O. Armour, School of Art, Battersea, design for printed muslin; James Kincaid, School of Art, Glasgow, design for a hanging and carpet rug; Thomas W. Long, School of Art, Battersea, designs for printed muslin; George Marples, Royal College of Art, South Kensington, design for damask serviettes; Ernest H. Simpson, School of Art, Leeds, stencilled design for the decoration of a dining-room; Bertrand Whittaker, School of Art, Macclesfield, design for a damask table-cloth. The next award will be made in 1900, when six prizes will be offered for competition.

LINLITHGOW.—The competitive plans of Messrs. John Melvin and Son, architects, Alloa, for a new infectious diseases hospital to be erected at Linlithgow have been accepted by the Joint Committee of the Burgh and District Committee of the County Council. Accommodation will be provided for twenty-four beds, and the estimated cost is between £6,000 and £7,000.

CHIPS.

On Thursday in last week, at the invitation of the Samford Board of Guardians, a number of gentlemen from Ipswich and the locality assembled at Tattingstone Workhouse to inspect an aërated bacterial filter recently erected there, and to meet Colonel Ducat, the patentee, who explained his system.

Good attendances were given at the Estate Market, Tokenhouse-yard Mart, all last week, and a considerable amount of business was conducted, prices being well maintained, a few ground rents making 30 years' purchase.

The occupiers of a number of tenement shops at the Kennington end of the Brixton-road have received notice to quit, as the land has been leased for the erection of a Rowton lodging-house.

The erection of a new lighthouse, 76ft. high, at the end of the Admiralty Pier, Dover, was completed on Friday. It was brought into use on Saturday, having passed the Trinity House inspection.

A chancel screen has been erected in Wooburn Parish Church, near Maidenhead, by Miss Du Pré, in memory of the late Mr. James Du Pré, who was a Member of Parliament for Bucks some years ago.

The Harrogate Corporation Electric Light Works are to be extended. The town council have decided to borrow £28,000 for the purpose.

Mr. E. A. Sandford Fawcett, A.M.I.C.E., Local Government Board inspector, attended the town-hall, Felixstowe, on Tuesday week, to hold an inquiry upon the application of the urban district council to borrow £4,332 for making-up Quilter, Gainsborough, Ranelagh, Station, and Cobbold-roads. Mr. G. S. Horton, the surveyor, explained the proposals.

Another Rowton House is now nearing completion in Hammersmith-road. It is Late French Renaissance in style, built of dull red brick, with brick dressings of a brighter shade, and having buff terra-cotta window-hoods and mouldings. It will contain 800 beds, to be let at 6d. a night.

The Wetherby Rural Council have decided to apply for permission to borrow £2,000 for drainage purposes at Tockwith.

An hotel was opened near the railway station at West Runton, near Cromer, last week. The building, which is in the Queen Anne style, has been built by the proprietor, Mr. James Abbs. It contains 32 bedrooms, drawing-room, dining-room 50ft. by 20ft., kitchens, &c., smoke-room, three private sitting-rooms, entrance-hall, and staircase running up through the main part of the building. The woodwork was chiefly done by Messrs. Lambert Bros., Lowestoft; the decorative work was carried out by Mr. Bouttell of Sheringham; and the plastering by Messrs. R. and R. Green, of Lynn.

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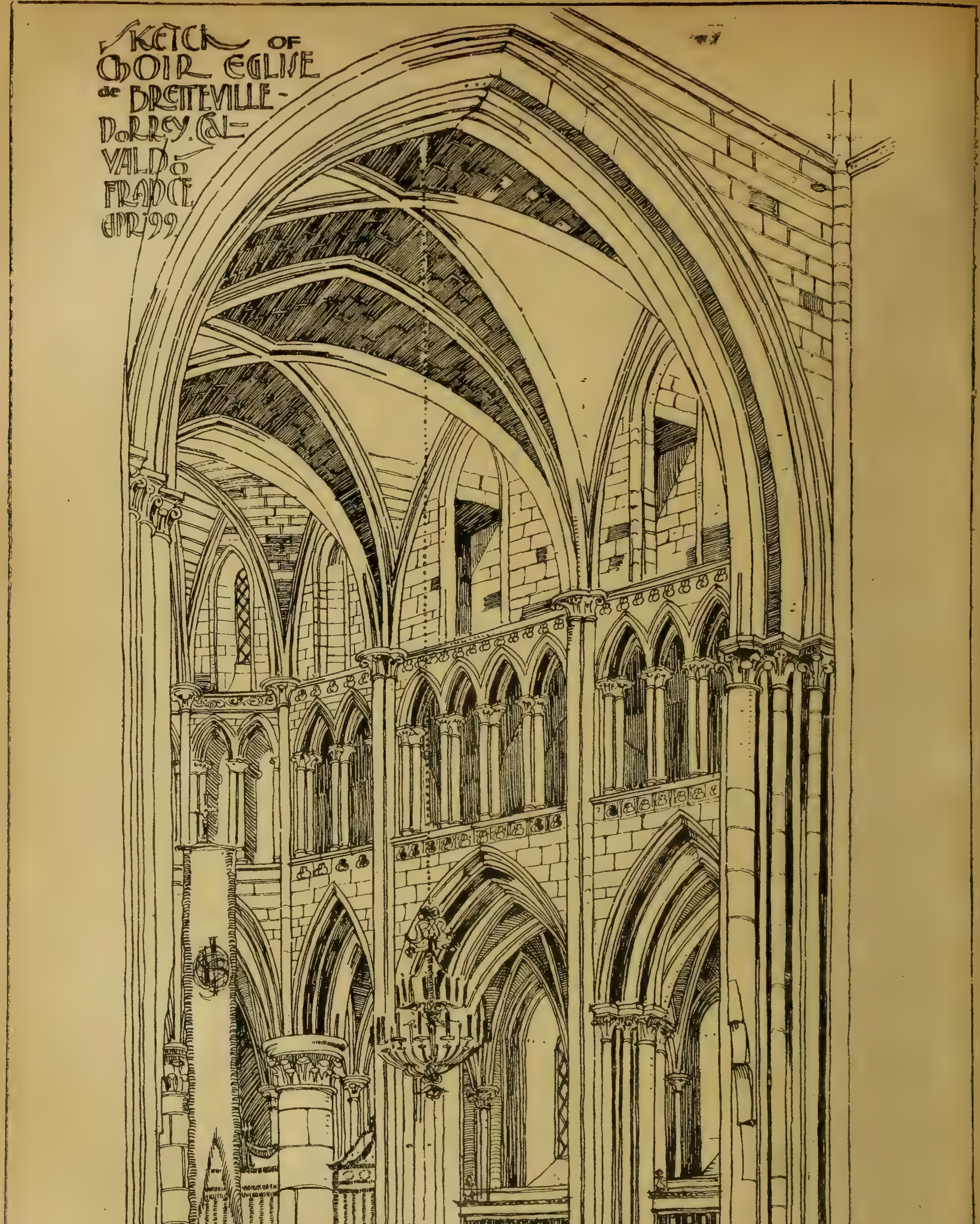
* The following illustrations of Ely Cathedral have appeared in the pages of the BUILDING NEWS:—Plans, May 16, 1884, and Jan. 15, 1886; west front, photographic general view, July 13, 1888; west tower, from north (sketch by J. Johnson), Aug. 30, 1889; west tower from south, with college chapel (by J. Donkin), Dec. 23, 1881, the octagon and south transept (by J. Johnson), Oct. 30, 1889; the lantern (full-page wood-cut, by R. W. Mallett), July 10, 1868; interior of choir, looking east, Dec. 2, 1870; interior of choir looking west, Aug. 3, 1889; the crossing, under lantern, Aug. 3, 1889; prior's doorway, March 1, 1889; tympanum over prior's doorway, Oct. 28, 1887; bay of nave (measured by H. G. Northey), March 5, 1880; north choir aisle (by J. Donkin), Dec. 22, 1882; wall arcading, Lady chapel (Pugin Travelling Studentship Drawings by Leonard Stokes), March 19 and April 2, 1880; Bishop Alcock's tomb, March 1, 1895; gates, Bishop West's chapel (by J. J. Joass), Oct. 4, 1893; Prior Crauden's chapel (Pugin Trav. Studentship Drawings by W. H. Bidlake), March 6, 1885; and tile paving, Prior Crauden's chapel (by J. J. Joass), Oct. 4, 1893.


SKETCH OF
CHOIR EGLISE
de BRETTEVILLE-
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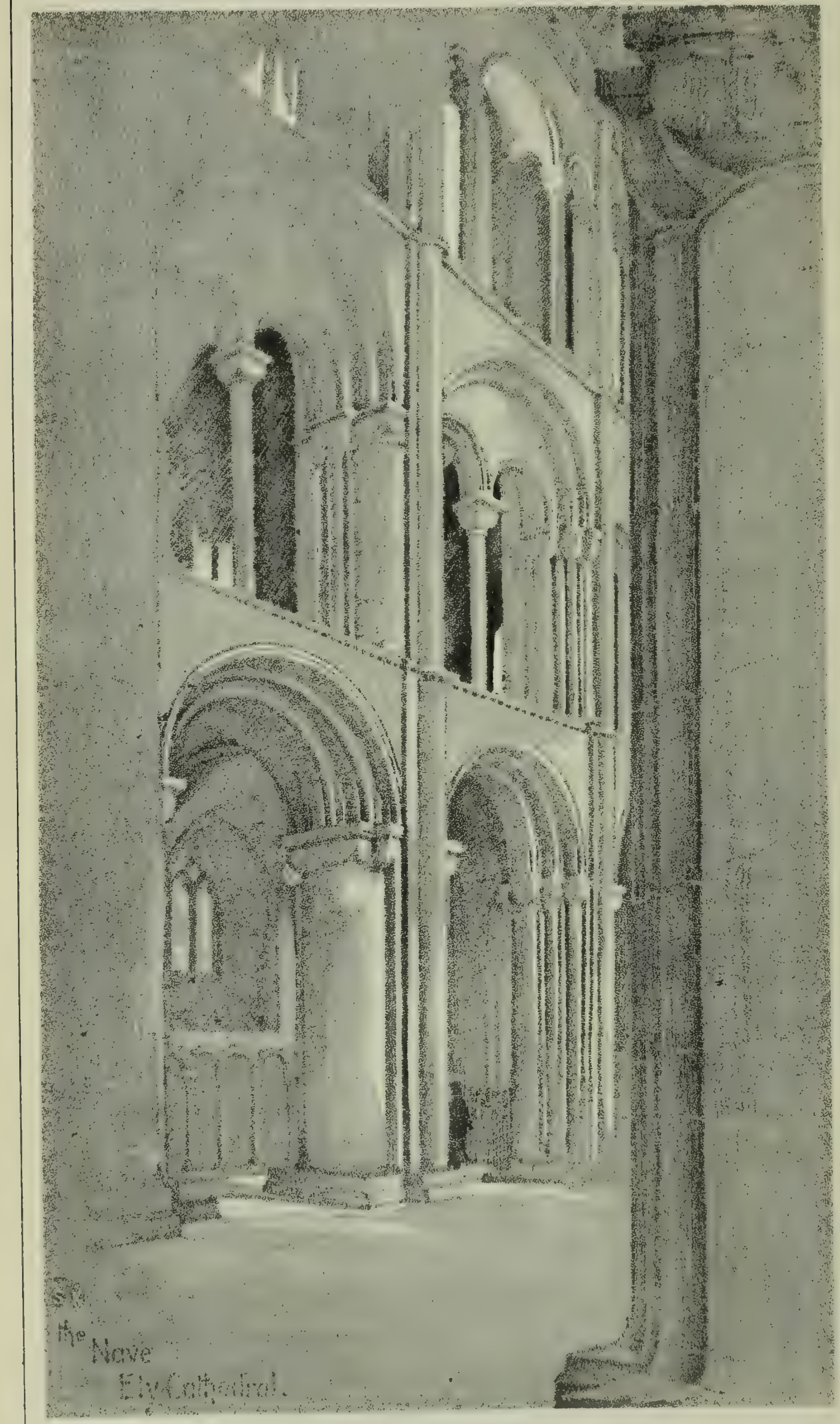
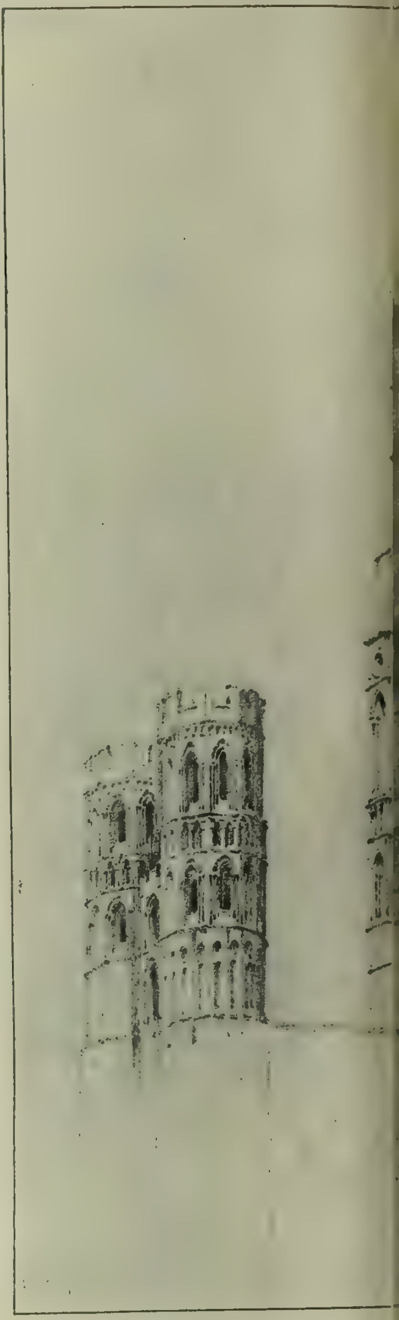
VALDoS
FRANCE.
APR/99.

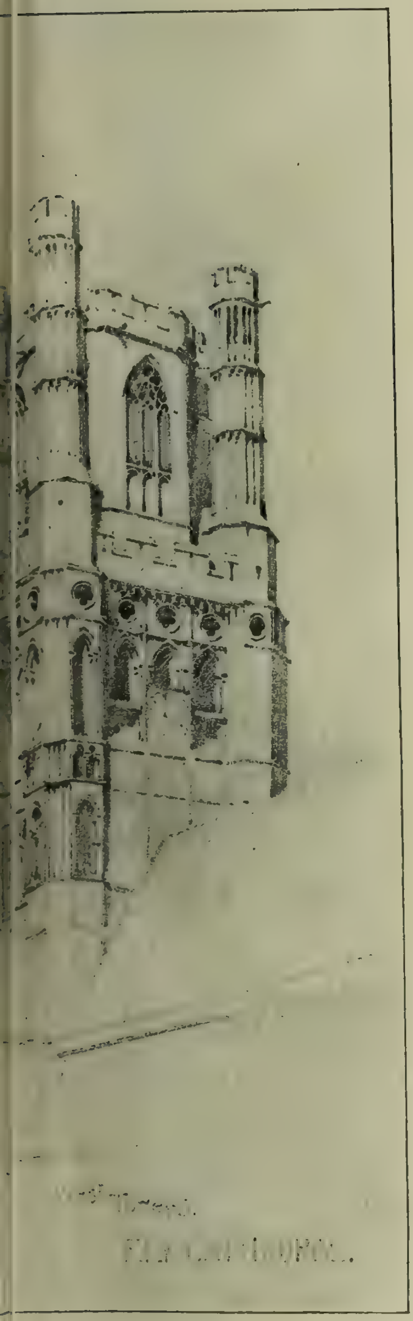
· STUDIES OF ARCHITECTURA

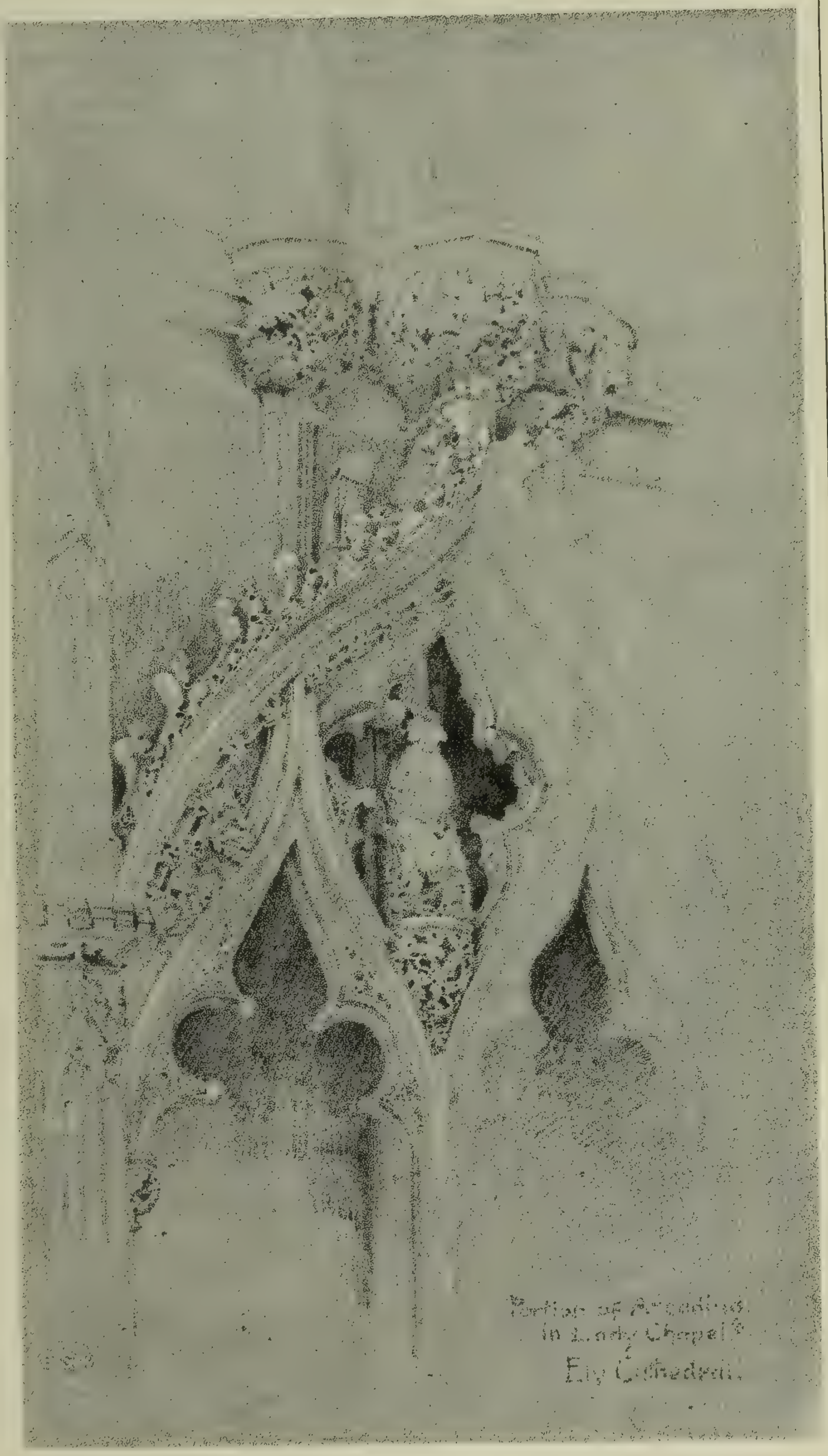




· NATIONAL GOLD MEDAL

ETAIL BY GEORGE MARPLES


West Tower.
Ely Cathedral.

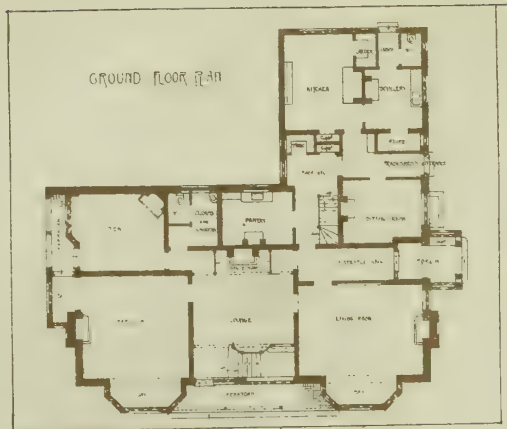

Portion of Arcading
in Lady Chapel.
Ely Cathedral.

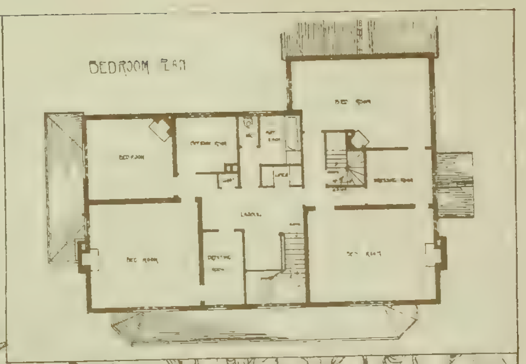
WINGS ELY CATHEDRAL

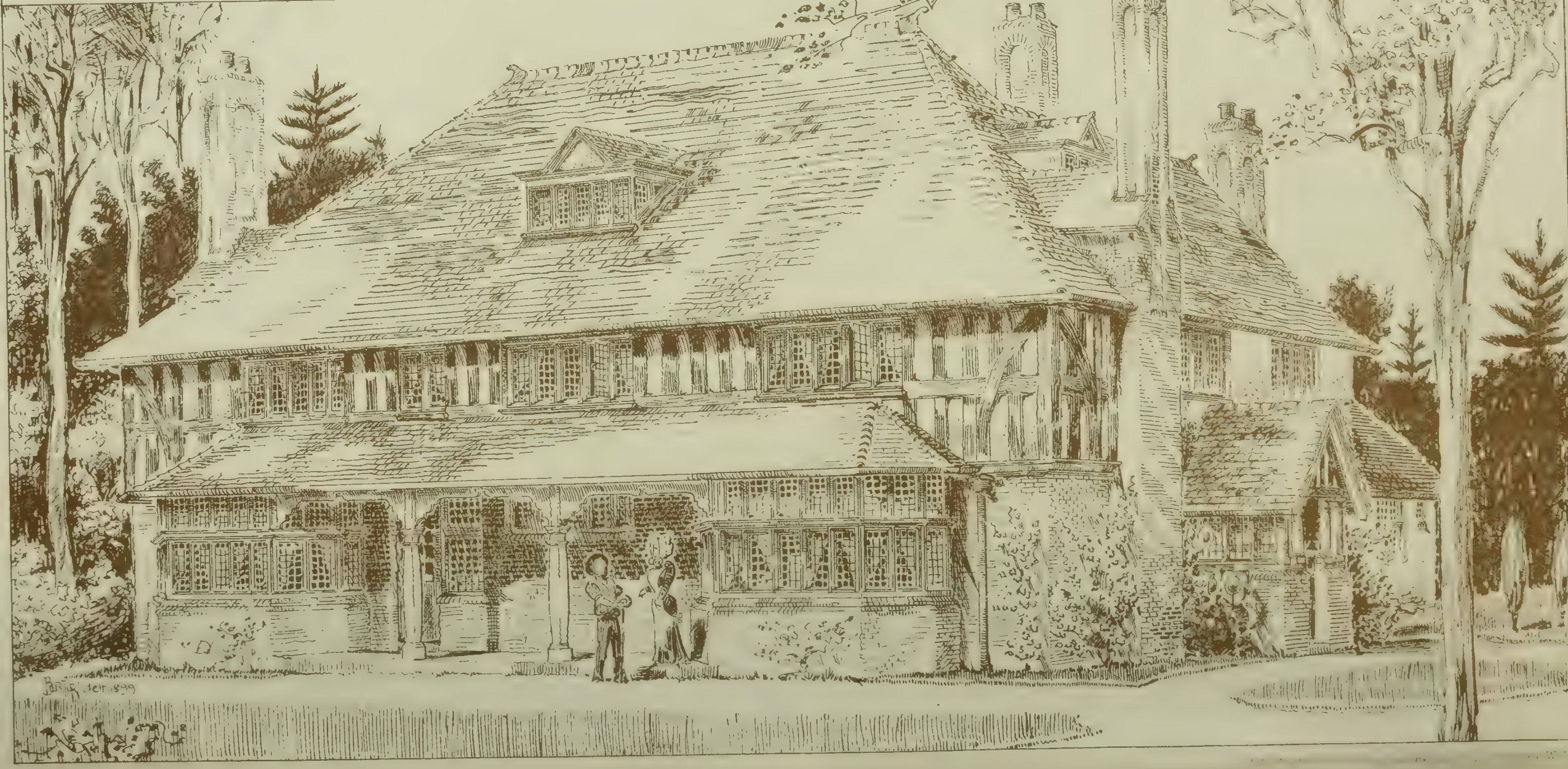
"PHOTO-TINT" by James Akerman, 6, Queen Square London. W.C.

THE COTTAGE
KINGSBURY

W. WEST-NEVE ARCHITECT


GROUND FLOOR PLAN


BEDROOM PLAN

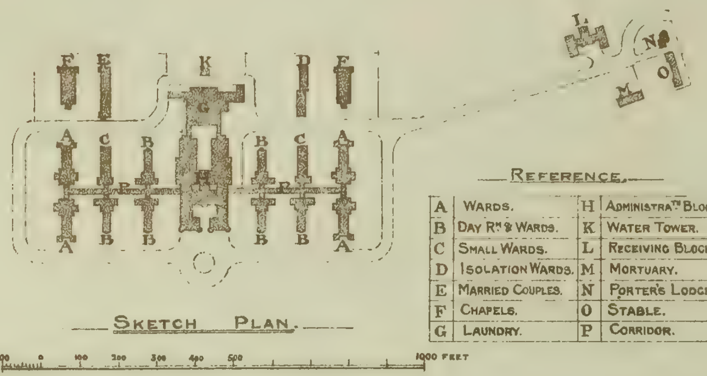


S^T. OLAVE'S UNION.

ACCOMMODATION FOR THE
AGED AND INFIRM POOR

LADYWELL

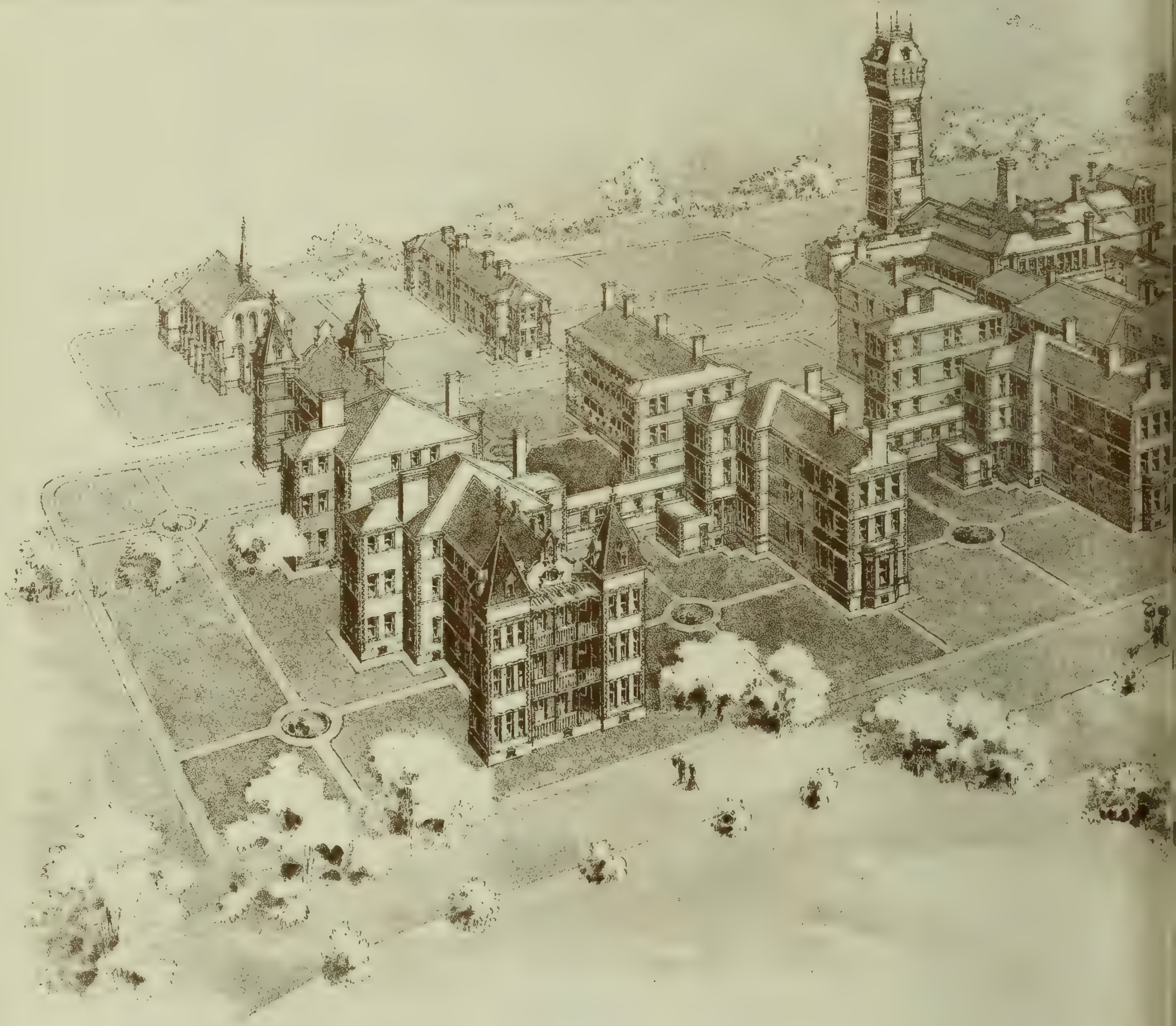
NEWMAN & NEWMAN, ARCHITECTS.

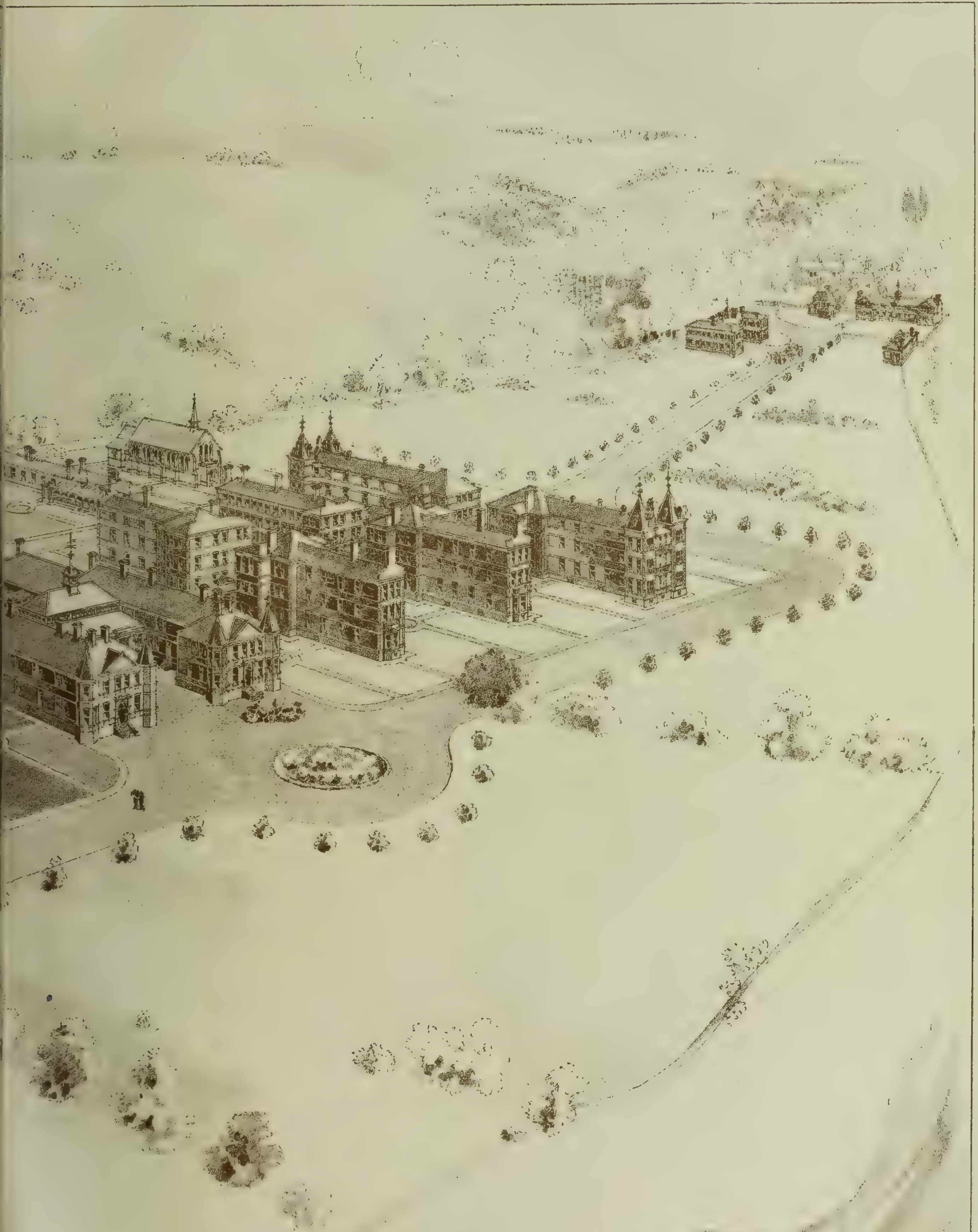


SKETCH PLAN.

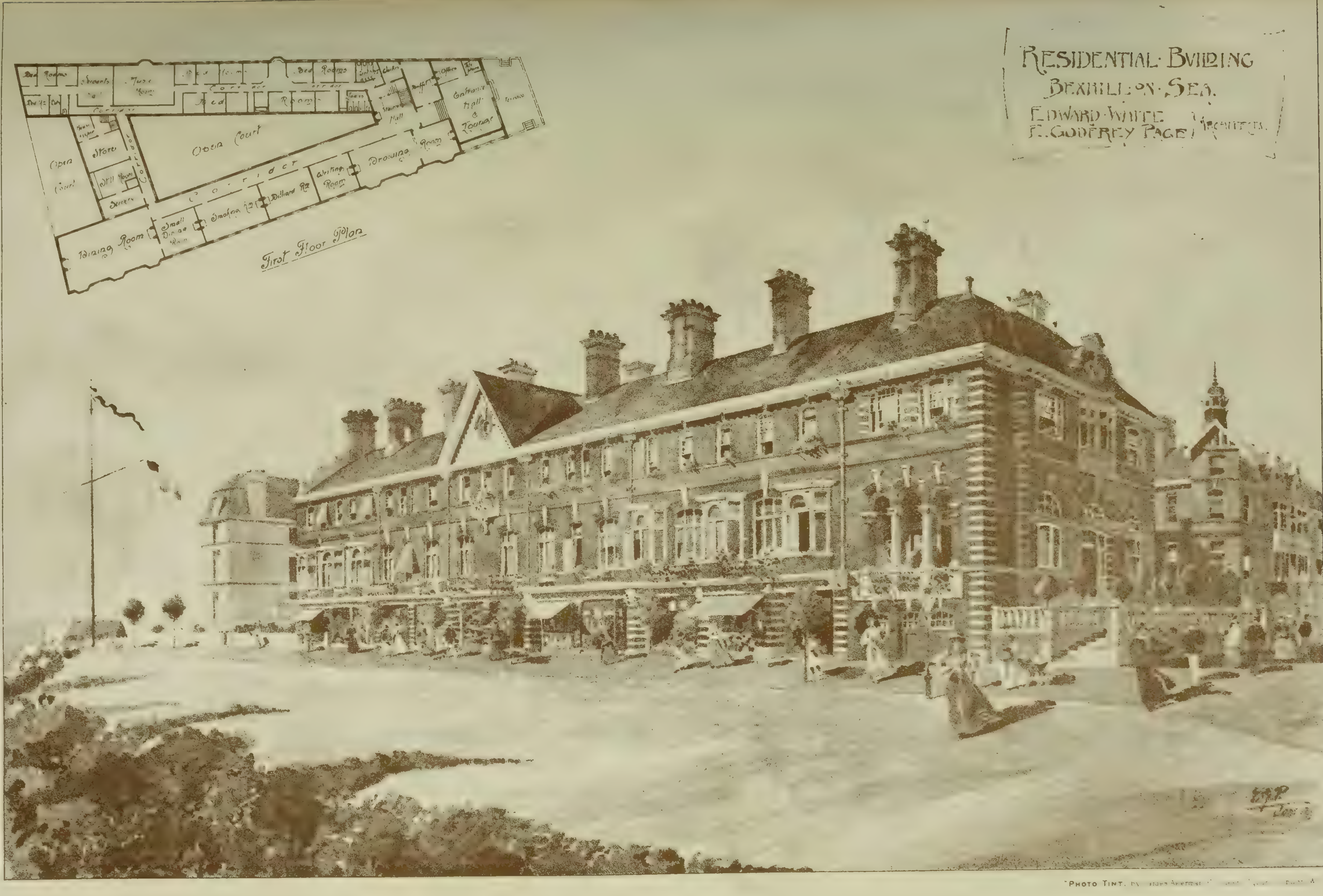
REFERENCE.

A	WARDS.	H	ADMINISTRAT^N BLOCK.
B	DAY R^MS & WARDS.	K	WATER TOWER.
C	SMALL WARDS.	L	RECEIVING BLOCK.
D	ISOLATION WARDS.	M	MORTUARY.
E	MARRIED COUPLES.	N	PORTER'S LODGE.
F	CHAPELS.	O	STABLE.
G	LAUNDRY.	P	CORRIDOR.





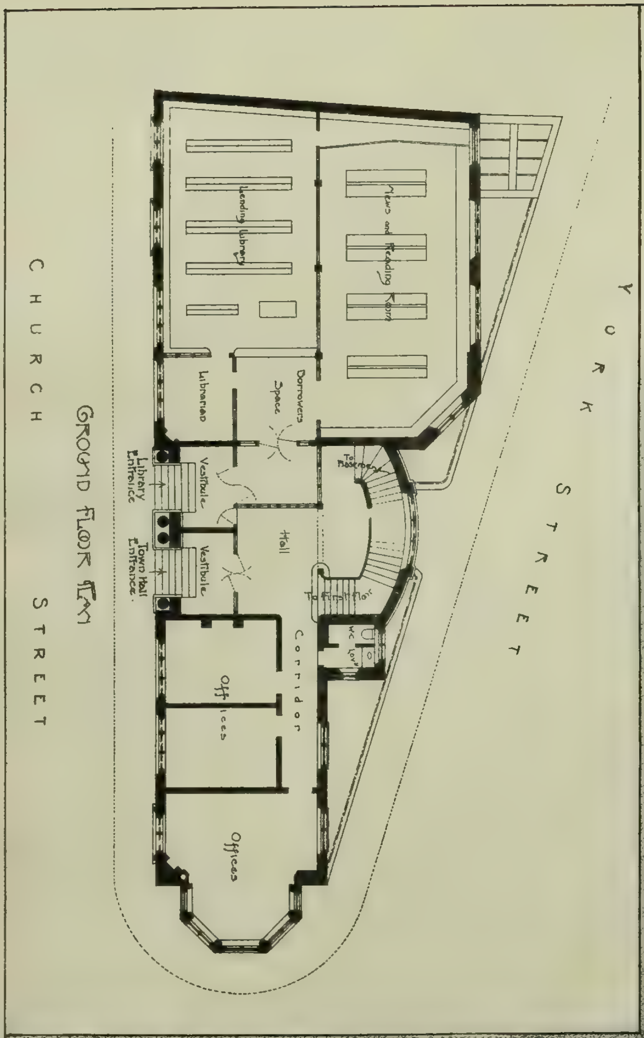
"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.



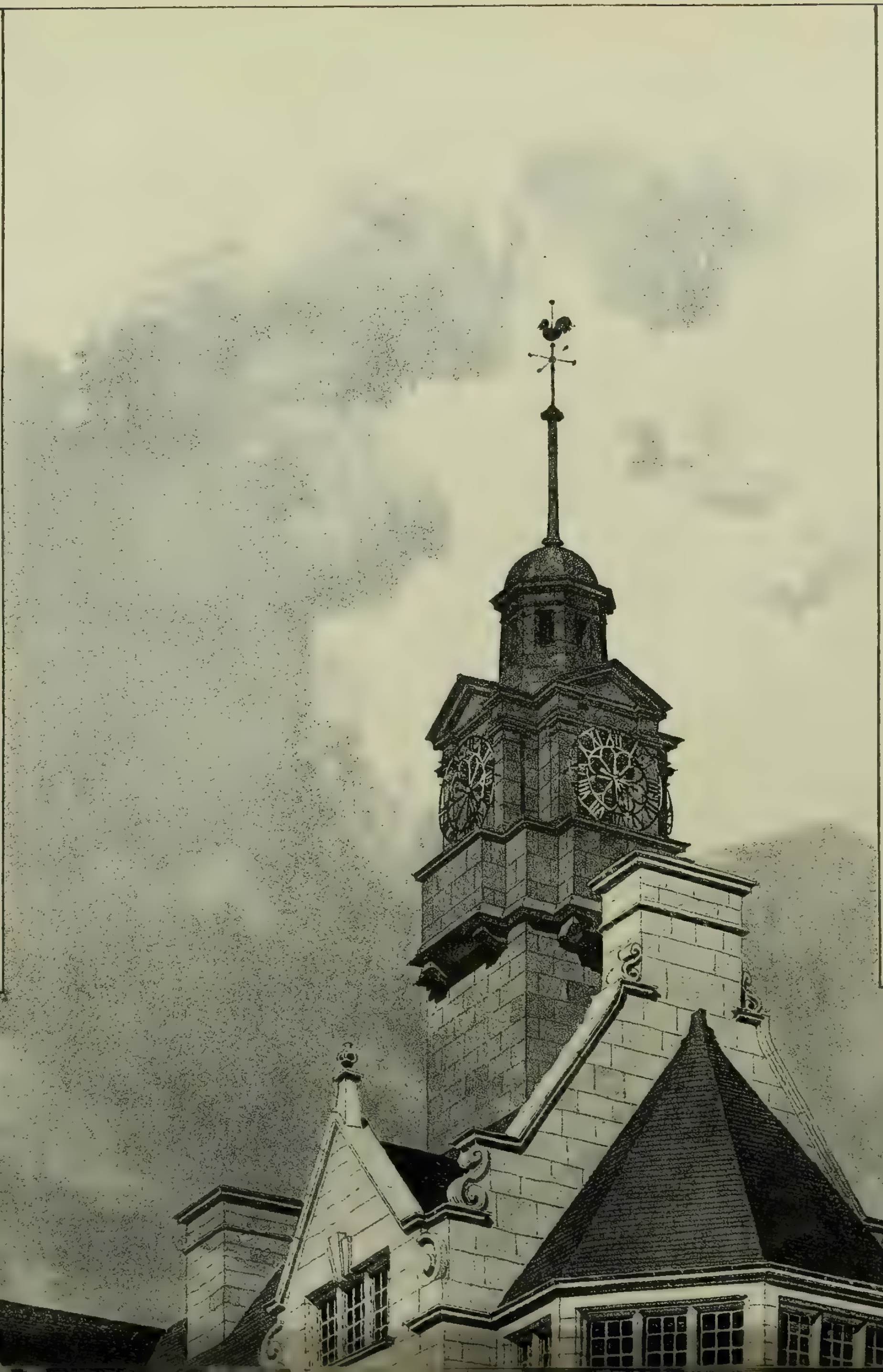
First Floor Plan

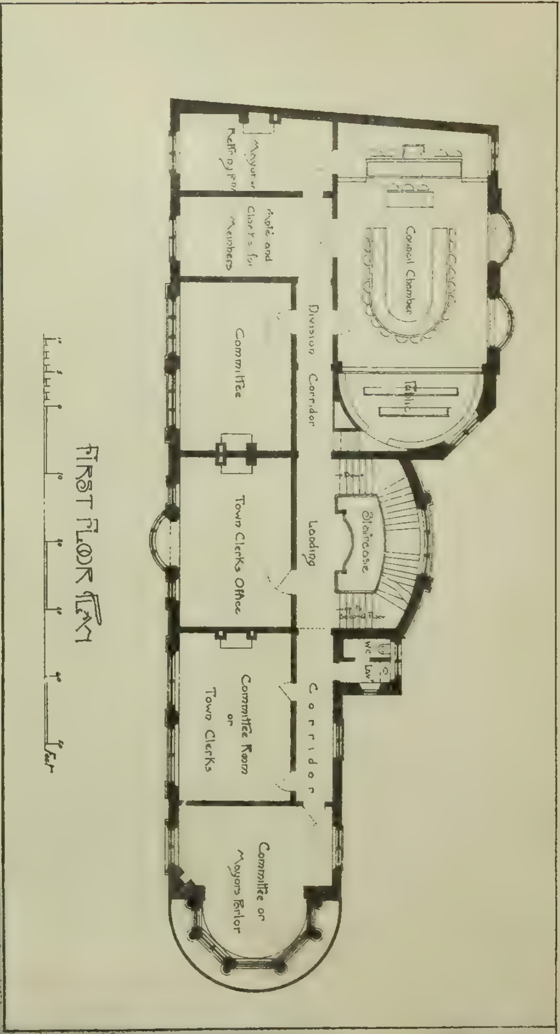
RESIDENTIAL·BUILDING
BEXHILL·ON·SEA.
EDWARD·WHITE
E. GODFREY PAGE ARCHITECTS.

"PHOTO TINT," BY [illegible] AKERMAN [illegible]

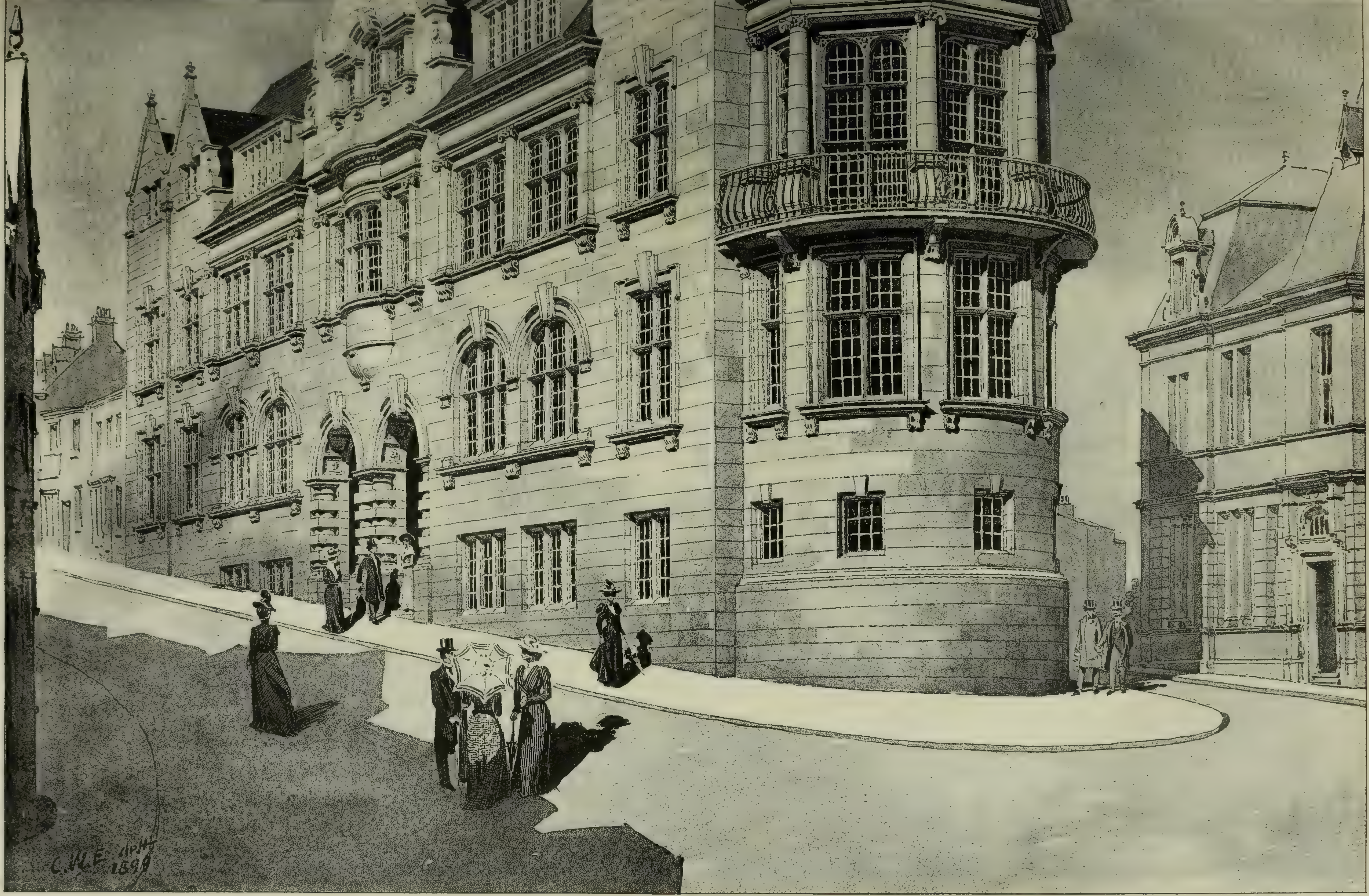


GROUND FLOOR PLAN



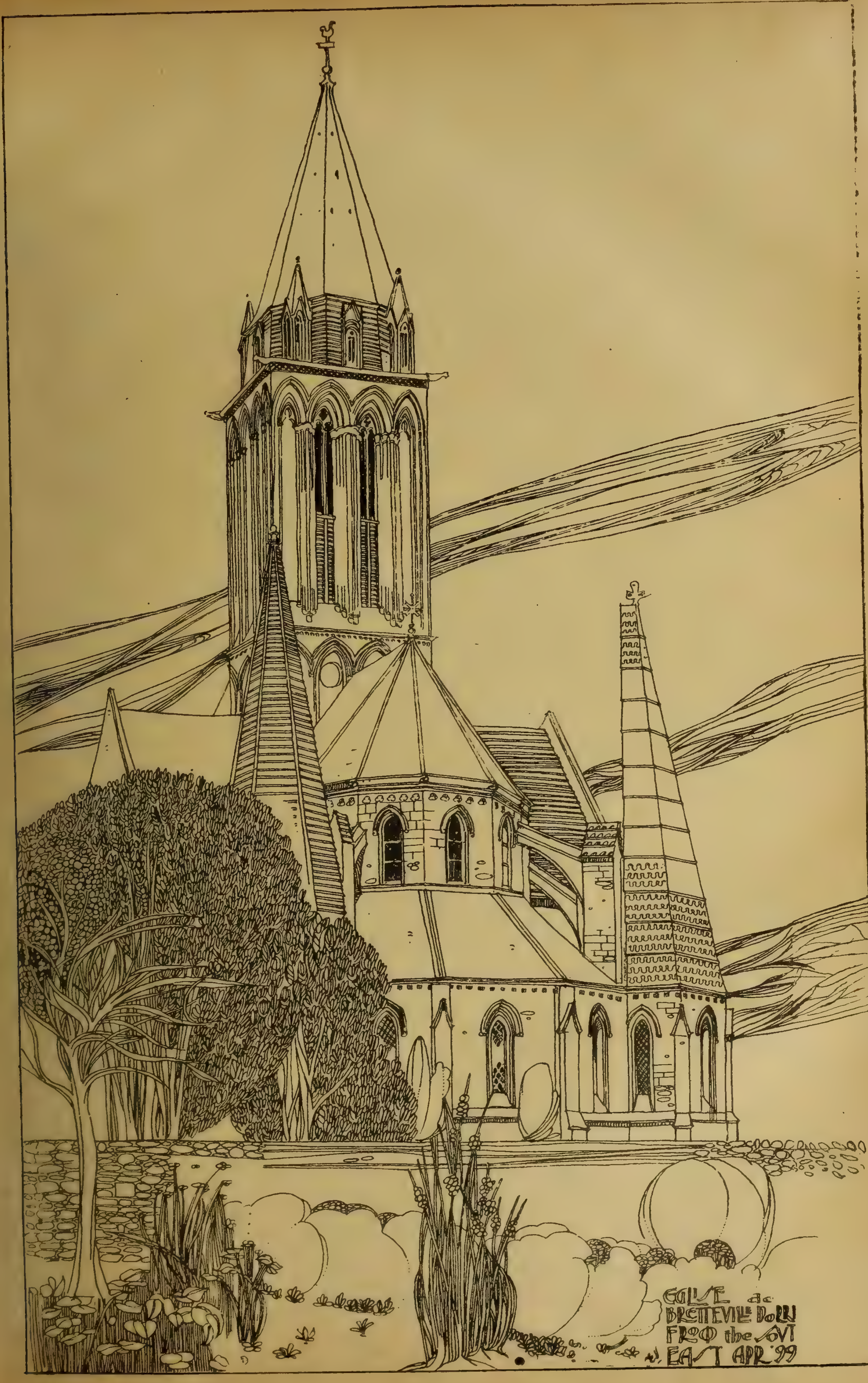


FIRST FLOOR PLAN



"PHOTO-TINT", by James Akerman 6 Queen Square London W.C.

CLITHEROE NEW TOWN HALL BRIGGS AND WOLSTENHOLME ARCHTS


EGLISE de
BRETTEVILLE DoRLN
FROM the SOUT
EAST APR '99

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—W. H. S. and Son.—H. and G.—B. U. D. C. —T. L. B.—Iraz.—S. S. and Co.—W. and G.—B.— L. D. S. Co.—B. C. Co.—J.—C. H.—W. P. and S. of L. —R. B.—R. J. T. of M. B.—S. S. G. of H.—E. J.— C. W. P.—G. F. G.—A. M.

G. B. N. of B.—Thanks for information, which, however, was forestalled by another correspondent, and appeared in our last issue, p. 215.

A. R.—Yes; a legitimate "extra."

J. D. P.—Nothing in it against the by-laws that we can see. What does the local surveyor say?

Uncertain.—The architect is right. He could not withhold the certificate under the circumstances. If he had done so the contractor would have proceeded against him. You seem to us to be keeping the builder out of his money unwarrantably.

Berks.—Go to S. and E. Collier, Reading. You cannot do better for red or buff work in your district.

Dry Rot.—Carbolineum avenarius (Peters, Bartsch, and Co., Derby) is the best preventive you can use. It is cheap to apply, and very lasting.

Hotel.—Nothing to beat Rendle's system. In the case mentioned have the astragals of copper.

Fancy.—W. Oliver and Sons, 120, Bunhill-row. You will find what you want there, and all dry and fit for immediate use.

Glazier.—The British is better in all respects. We would not use the Belgian. Go to the British Plate Glass Co., Ravenhead, St. Helen's. They have an agent in Leeds, at 12, East Parade.

Eboracum.—We simply gave the figures in the report to which we refer. You are right in saying an ordinary bricklayer now cannot lay more than 500 bricks per day. We are of your opinion that all trades should be learned during apprenticeship, and be supplemented by class teaching.

Intercommunication.

QUESTIONS.

[12288.]—**Instructions to Obtain Tenders.**—Will someone having experience kindly reply to the following query? Does "instruction to obtain tenders" carry with it authority to have quantities taken out? Are there any legal decisions thereon? Owner, in order to reduce tender for his house, instructs builder to strike out charge for quantities, &c., and accepts tender in consequence. Architect and quantity surveyor not informed of this "little deal." Owner and builder now repudiate liability. Former says he gave no order for quantities, did not want, and won't pay for them. Builder admits he could not have tendered without them, but pleads owner's instructions; says *he* cannot pay. Any legal decisions upon the position will be much esteemed by—Inexperienced.

[12289.]—**Commission on Drainage Scheme.**—I am about to carry out a small drainage scheme costing about £800. Will some fellow-reader suggest what commission I should charge? Is it usual to charge so much per cent. on the outlay? If so, how much? And is this to cover surveying area, attending Local Government Board inquiry, and other meetings?—W. F. J.

[12290.]—**Parchment.**—I have a number of plans to put on parchment, many of them requiring large washes of colour. I presume that nothing beyond pouncing can be done to overcome the ordinary difficulties of colouring on parchment? It seems necessary, however, to mount these skins, as they are of large size; but the preliminary damping of the back for this purpose results in an immense number of dark, greasy-looking spots of all sizes, and these do not dry out. Why is this? Is the parchment defective, or do these spots always appear on damping? I do not remember them on previous occasions. I have tried sizing the sheets, but with only questionable results.—R. A. B.

[12291.]—**Two-Coat Plaster.**—Will an experienced one tell me what each coat in two-coat work should consist of, and the advantage of having three-coat work?—Youth.

[12292.]—**Mahogany and Oak Joinery.**—I should like to know the prime cost of mahogany and oak of a superior quality?—A. G.

[12293.]—**Wood Paving.**—The streets of London are being paved with wood blocks of a very hard and, to all appearance durable, quality. Will some one tell me the name of the wood used in the busy thoroughfares, and which stand the traffic so well? Also the cost, and oblige.—Countryman.

[12294.]—**Ordnance Datum.**—In some Ordnance maps the following statement is engraved "The altitudes are given in feet above the approximate mean water at Liverpool." What does this mean? Will any reader explain?—Datum.

[12295.]—**Architect's Charges.**—An architect obtains tenders from a contractor for carrying out a building. Is he entitled to charge ½ per cent. on the lowest of these when he has not prepared quantities? There are some who contend he has no right to charge on a builders' estimate, notwithstanding the Institute Schedule. Is he legally entitled to do so?—Query.

[12296.]—**Ventilation of House Drains.**—Will an experienced sanitary reader inform me if it is necessary to have an inlet for fresh air to the trap of drain laid under the house, as well as to carry up the soil-pipe full bore above the roof? Where should the inlet be placed? There is no room at the side of house, and the only place in front would be the forecourt, if it is not attached to the front of house.—J. B. S.

[12297.]—**Masonry and Stone-Cutting.**—Are there any easy rules to give the way of setting-out the voussoirs of a stone niche? What is the "Saint Antoine back-vaulting"? Will anyone give me information?—A Student.

[12298.]—**Macadam.**—Where can I find an authentic account of Macadam's directions for making the road surfaces known as macadamised? It is stated that in many cases our roadmakers use stones too large, and it certainly seems like it from what can be seen on the Embankment now.—Pica.

[12299.]—**Water Lifting.**—Can any reader experienced in the above tell me the cheapest and most efficient means by which I can force 20,000 gallons of waste water (in about two hours) from a tank to a meadow about 500 yards distant? The top of the tank is level with the ground, but the meadow is about 33ft. higher than the bottom of tank. The apparatus must not be liable to clog. I have a 10H.P. steam-engine, which is 25 yards from the tank.—Waterloo.

[12300.]—**Automatic Flushing Cistern.**—Will someone please give a working sketch and explain the construction of the automatic cisterns used for flushing urinals?—I. K.

[12301.]—**Sundial.**—Can anyone inform me what would be the best cement to use to fasten the style of sundial down to the face of the instrument? The style is of brass, the face of slate. There are brass pins that go down into the face; but they have worked loose.—D. C.

[12302.]—**Bent Timber.**—Will anyone kindly say what smaller curve it is necessary to give to a piece of timber that has been steamed to be bent, so that when it springs after removal it may assume the correct curve that was desired?—Engineer.

[12303.]—**Mensuration.**—Will one of your mathematical readers kindly show the working out, by mensuration, of the following? A circle is described about a regular hexagon, and a second hexagon is described about the circle. The difference between the area of the two hexagons is 813sq.in. Find the area of the circle.—P. T.

REPLIES.

[12286.]—**Professional.**—I cannot see that "H. W." has anything to complain about, and it is certain that he can do nothing. It is a very common thing for firms of estate agents to recommend one or more architects—in fact, in the London district a very large amount of professional work is done by the large firms of estate agents or their nominees. If the gentleman who is called an "assistant" in the question practised on his own account, there could be no grievance, so the fact of his holding an appointment is of little consequence. Scores of people, agents and officials, recommend their friends for any architectural work. Such a state of things has always existed, and always will.—Henry Lovegrove.

[12286.]—**Professional.**—"H. W." alleges a hard case, in which one of the assistants of an architect in a certain town is allowed to carry on practice on his own account, the principal having a land agency by which his assistant is thus posted in all building schemes of the locality. There is no law in operation by which this state of things can be prevented. The only remedy is to pass the Architects' Registration Bill, so as to prevent any incompetent person from practising. Till that time arrives, architects' assistants, with the consent of their principals, can carry on businesses of their own. It is questionable policy for any principal to allow his assistant to practise architecture while he carries on an estate business, and no doubt the said individual is not properly an architect himself, and engages an assistant to do the architectural work. I believe there are many surveyors who carry on a kind of joint partnership in this way. It is hard for properly qualified practitioners in a small town; but what they cannot prevent they must bear. Qualification and ability will, in the long run, hold their own.—Country Practitioner.

[12287.]—**Dairy.**—"The Book of the Dairy," by Fleschman, Aikman, and Wright (Blackie and Sons, publishers, 1896), may supply "Enquirer's" wants.—Regent's Park.

[12287.]—**Dairy.**—"Enquirer" should refer to books in the library of the Surveyors' Institution, or write to Mr. W. C. Young, Secretary, British Dairy Farmers' Association.—H. Lovegrove.

CHIPS.

The Sultan of Turkey has decided upon the construction of a new palace near Yildiz Kiosk, at a cost of £80,000.

Mr. Larner Sugden, F.R.I.B.A., of Hanley and Leek, is about to visit Hamburg, Copenhagen, and Stockholm, in order to inspect the technical schools; a recommendatory letter from the Foreign Office explains that Mr. Sugden is travelling to make inquiries as an architect for the information of the Technical Committee of the Leek Urban District Council in connection with the building of the Urban School of Technology, Science, and Art at that town.

The parish church of Amroth, Pembrokeshire, has been reopened after restoration at a cost of £700. It is an interesting structure, possessing a splendid twelfth-century tower.

The board of guardians for Barnstaple have instructed Mr. W. C. Oliver to prepare plans for homes for pauper children.

The Bishop of St. David's consecrated, on Friday, the church which has been erected at Ystrad Meurig, in Cardiganshire, in memory of Edward Richard, one of the early workers on behalf of Welsh education. The architect was Mr. Harold Hughes, of Bangor, and Messrs. Charles Davies and Co., of Llanfarian, were the builders.

Mr. John S. Warr, secretary to Waring and Gillow, Limited, writes from 175, Oxford-street:—"Some six months ago we gave you our experience under the Act and showed that for the half-year, from July 1 to December 31, 1898, our claims had been £93 against £1,250 asked by the insurance companies for six months' premium. For the six months ended June 30, 1899, our payments for injuries amount to £18, making a total for the year of £111."

A large clock, with four 8ft. dials, chiming the Cambridge quarters, and striking the hours, has just been erected upon the parish church, Swansea, by Messrs. John Smith and Sons, Midland Clock Works, Derby.

The House of Mercy for Sisters of Mercy, Dungarvan, is being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland Brothers, of Manchester.

The adjourned inquest respecting the death of Tom Lewis, son of an architect residing at Willaston, Nantwich, was held on the 17th inst. The lad, who was employed at Mr. James Wood's sawmills, and another work boy named John Thomas Jones got to high words. Jones lifted his hand as if to strike Lewis, who then swung his arm and hit Jones in the ribs. Jones struck Lewis on the temple, knocking his head against a post and causing him to fall to the ground. The lad lay motionless on the floor for ten minutes, it being supposed he was shamming, but on being assisted to his feet he complained of his head. He remained at his work until 5.30, but died at 10 o'clock the same night. The jury returned a verdict to the effect that Lewis accidentally met his death.

The business recently carried on by Mr. John E. C. Carr under the name of "The Crafts" at Longsight, Manchester, has been purchased by Mr. Geo. Wragge and transferred to Salford. The new business will be devoted to the practice of the applied arts, chief among which will be those of stained-glass and lead-light making. Mr. Wragge has been commissioned to supply the stained-glass and casements to one of the rooms in the Royal Pavilion at the forthcoming Paris Exhibition, and the increase in his business has necessitated the opening of additional offices in the Bigg Market, Newcastle-on-Tyne.

LEGAL INTELLIGENCE.

The Crystal Palace Company and the London Building Act, 1894.—The Penge magistrates gave their decision on Tuesday in the case of the four summonses taken out by the London County Council against the Crystal Palace Company for an alleged infringement of the London Building Act, 1894, by erecting some polo stables in the grounds of the Palace without having first obtained the sanction of the Council. The case was heard a month ago, and the Bench had taken time to consider their decision. The chairman (Mr. James Judd) said the question the magistrates had to decide was whether the erections specified in the four summonses were subject to the provisions of the London Building Act, 1894. It seemed to be quite clear that no special exemption was made to the buildings of the company by the London Building Act of 1894, as was the case with various other erections and buildings in different parts of the County of London, and of certain specified natures, enumerated in the 201st and following sections of the Act. It was proved that the buildings were in the grounds of the Crystal Palace, and that they were situated at a distance of more than a quarter of a mile from the main building. After referring to the various private Acts of Parliament which had been obtained from time to time by the Crystal Palace Company and the exemptions they conferred, the chairman said that in 1881 the company obtained another private Act. By section 21 of that Act the "main building, conservatories, and waterworks of the company, and the conveniences and other works immediately connected therewith," were exempted from the operation of part 1 of the Metropolitan Building Act of 1855. The magistrates were of opinion that the exemption conferred on the company by that section still remained in force, notwithstanding that the Metropolitan Building Act of 1855 had been repealed by the London Building Act of 1894, as they considered that such exemption was kept alive by the 218th section of the Act of 1894. The 21st section of the Act of 1881 extended or increased the exemption which the company had originally enjoyed, inasmuch as by inference it included such part of the main building or conservatories as were or should be chiefly composed of masonry and timber, and also included the waterworks of the company and the conveniences and and other works immediately connected not only with such waterworks, but with the main building and conservatories also. It also increased or extended such exemption in another direction. It now remained for the Bench to consider whether or not section 21 of the company's Act of 1881 exempted the buildings or erections now the subject of their inquiry from the operation of part 7 of the London Building Act of 1894. The Bench did not think that, in order to claim the benefit of this exempting section, the "conveniences or other works" must of necessity be structurally attached to either the main building, conservatories, or waterworks of the company. Section 20, which they would read with section 21, gave the directors power to erect in the Crystal Palace grounds twenty cottages for their workmen, with "all suitable buildings and conveniences connected therewith." If these polo stables were "conveniences or other works immediately connected with the main building," they would unquestionably be free from the control of the London County Council. They might, no doubt, be conveniences or other works; but were they immediately connected with the main building, conservatories, or waterworks? In the view of the magistrates, the meaning of the words "immediately connected therewith" was that they were intended to apply to conveniences or other works closely appurtenant to or such as were required for use as adjacent appendages of the "main building, conservatories, and waterworks of the company." They held that the buildings in question could not be so described, and were therefore not exempt from the operation of part 7 of the London Building Act of 1894. They had, therefore, decided to convict on each of the four summonses. They would impose a penalty of 10s. and 7s. 6d. costs in each of the four cases, with an extra five guineas on the first summons, and in the exercise of their discretion they would not require the Crystal Palace Company to obtain the approval of the London County Council for the erection of these buildings, as they had already been completed and were such as the Council would have approved. Nor would the Bench order the stables to be demolished. Mr. Glen intimated that the Crystal Palace Company would carry the case further. The chairman said the question raised was a very important one, and the Bench would willingly state a case. Mr. Glen said the usual notice would be given.

Margate Arbitration.—Mr. Percival F. Tuckett, F.S.I. (Messrs. Tuckett and Son, 2, Basinghall-street, City), has disposed of a series of claims arising out of the acquisition of land for the Isle of Thanet Light Railway Company's purposes. Among the cases was that of Mr. J. F. Friend, of the Northdown Estate, Margate, who claimed £1,275 10s. for 1a. 2r. 16p. of land taken and severance damage caused by the railway passing through the estate. Mr. John Bayly, auctioneer, High-street, Margate, valued the strips taken, measuring altogether 1a. 2r. 16p., at £802 7s., and with ten per cent. for compulsory purchase, £882 11s. 6d. Mr. William Eve, F.S.I. (Messrs. Eve and Sons, 10, Union-court, Old Broad-street, E.C.), gave a total valuation of £1,255 2s. 6d., and Mr. Fred. T. Honeyball, F.S.I., of Deal, valued the damage at £1,960. On behalf of the Company, Mr. Page contended that the construction of the light railway through Mr. Friend's estate must give an increased money value and create a road frontage to the land, which would more than counterbalance the damage done by taking the land. Mr. James F. Field, P.P.A.I., F.S.I. (Messrs. Field and Son, 54, Borough High-street, and 52, Chancery-lane), said there was some prospective building value in claimant's estate, but for some years to come, had it not been for this light railway, it would have remained agricultural land. His valuation came to £320, to which he added 10 per cent., £32, making £352. Mr. H. Hinds, F.S.I., of Ramsgate, also considered that the railway would tend to the development of the estate and decidedly increase the value. Mr. Albert Latham, borough surveyor, Margate, treated the land at 1d. and 1½d. per foot super., and arrived at a total of £354 1s. 8d., and allowed £50 for angles. In his opinion, the betterment entirely wiped out the value of the land taken. Mr. Henry Hayward (Messrs. Worsfold and Hayward, of Dover) was also retained. The award in this and the other cases was reserved.

Re John Bradney, Harry Lloyd, and William Leppington, Builders, Shifnal, Wolverhampton, and Albrighton.—A meeting of the creditors of these debtors was held last week at the office of the Official Receiver, Wolverhampton. According to the statement of affairs, the liabilities amounted to £3,251, and the assets to £2,305. The Official Receiver, in his observations, explained that Bradney and Lloyd commenced business as builders at the Lizard Works, Shifnal, in March, 1893, with a joint capital of £500. Leppington joined them in 1897, and provided £355, which was borrowed, and still owing. Bradney had previously been in partnership in a similar business with Messrs. Skett and Butler, in Wolverhampton, where they traded as Bradney and Co. That firm was wound up in 1892 under a deed of assignment under which a dividend of 8s. 7½d. in the £ was paid on £4,777. In 1879 Bradney was in partnership with a Mr. Dawson as builders, in Wolverhampton, and upon Mr. Dawson's death the firm was wound up, but Mr. Bradney was unable to say whether or not the firm's debts were paid in full. Under the failure of Bradney and Co., in 1892, Mr. Bradney stated that the trustee sold to his (Mr. Bradney's) wife his furniture, household effects, and the equity of redemption in the house he then occupied in Compton-road, Wolverhampton. Mr. Bradney now practically possessed no separate estate. Mrs. Bradney had since acquired the freehold of the yard and premises occupied by Bradney and Lloyd, who became her tenants. Her purchases were made out of money left to her by Mr. Bradney's father, under that gentleman's will, to the exclusion of his son. The unfinished contracts of the bankrupts included one at Llandrindod Wells, £7,934; one at Wolverhampton, £1,590; one at Sutton Coldfield, £1,560; and one at Dawley, £350. A few months ago the debtors were pressed so severely that a deed of assignment was executed, but, as some of the creditors would not agree to it, the debtors filed their petition. They attributed their failure to want of capital, loss on contracts, and the increase in the price of materials and wages. The debtors were adjudicated bankrupts, and Mr. H. P. Smith, of Wolverhampton, was appointed trustee, with Messrs. W. S. Rowland, W. Beddows, H. B. Lavender, J. P. Butt, and W. Wave as a committee of inspection.

Failure of a Northwich Builder.—At Crewe Bankruptcy-court, before Mr. Registrar Speakman, Aaron Marsden, of 12, Darwin-street, London-road, Northwich, builder, attended for his public examination. The gross liabilities were about £800, of which about £298 were expected to rank, and the deficiency was estimated at about £261 3s. 8d. In reply to questions by Mr. T. Bullock (the Official Receiver), the debtor stated that he had been carrying on business as a builder at Northwich for the past five or six years. He had been there about ten years. Previously he had been at Ashton-under-Lyne in business about twenty years. He had failed while he was at Ashton-under-Lyne. He compounded with his creditors, paying, he believed, 5s. in the £, but most of them he paid in full. His total liabilities at Ashton were between £200 and £300. He came to Northwich as a joiner, and afterwards he took over a business, paying £160 for it. That money was lent to him at four per cent. He thought he was perfectly solvent at that time. He (the debtor) was mostly engaged in building speculation. He had several contracts, but he did not keep proper accounts, and could not tell whether he made a profit on them or not. He had no idea of the total amount of contracts he entered into in any one year—they were mostly small contracts. He had built houses and sold some, and his impression was that he had made money on some of the houses he had sold. He had kept a cash-book, but it had not been kept very correct. His books would not show his position. He accounted for his position by the depreciation of his property. The examination was adjourned.

What is a Building?—At the Southend Borough Bench last week, E. Johnson, H. Brooks, J. B. Lugar, and Frank Lindsay were severally summoned for erecting buildings without depositing plans on land commonly known as Wilson's or Pawley's Green. Mr. W. H. Snow, the town clerk, supported the summonses for the corporation, and Mr. R. E. Moore defended. The case against Johnson was taken first. Mr. Snow said these were wooden erections 8ft. 2in. wide by 6ft. 2in. deep, with an average height of 7ft. 6in. They were lock-up shops. He quoted the leading cases as to what a building was in law, and said it had been decided that where a structure was conveyed to its destination on wheels, and the wheels were then taken off, it was a building within the meaning of the Act. The defence to this action would probably be that the structures would only remain until the end of the season, and were, therefore, temporary; but to comply with the law a building must be temporary *ab initio* and throughout its existence. These were used as shops in the ordinary course of business. Alhtough agreements might be made only until the end of the season, they could, of course, easily be altered. These erections and the others, which were on the same land, were a nuisance and a disgrace, and the corporation wanted their powers determined. Mr. Matthew Tutin, buildings inspector, described the building, and in cross-examination said there were no gas or water pipes or any sanitary arrangements. Mr. A. Fidler, the borough engineer, also gave evidence. Mr. Moore said it would be giving a very strained meaning to the word "building" to say that it applied in any way. This was the only way that a private owner could beneficially enjoy the land, as it was not allowed to be built upon beyond a certain height. A "building" must involve substantiality and permanence. These were to come down at the end of the season. Defendant said his license from Mrs. Wilson was till Oct. 1, but the structure would be taken down on Sept. 15. It was not attached to the ground in any way, and could be lifted by two men. A carpenter named Carr said the structure could be taken away and put back again in an hour and a half, "so you couldn't call that a building." Mr. Leslie Wreford, architect, said the building, in his opinion, did not come within the by-law definition. Mr. W. Gillett, builder, described the erection as merely a show case. The bench decided that it was not a building within the meaning of the by-laws. The summons was dismissed with costs to defendants. Mr. Snow asked the Bench to state a case for the opinion of the High Court. This was agreed to, and the other summonses were adjourned to abide the result of the appeal.

In re H. Beech of Aintree.—A meeting of the creditors of Herbert Beech, a builder, of 23, Second-avenue, Longmoor-lane, Aintree, was held on the 16th inst., at the offices of the Official Receiver, Victoria-street, Liverpool. Mr. Ring, the assistant Official Receiver, presided, and reported that the unsecured liabilities amounted to £811 11s. 3d. There were creditors fully secured, representing £9,498 16s. 6d., and they held securities of the estimated value of £10,028 8s. 3d., leaving a surplus of £529 11s. 9d. The assets, including the surplus of securities, amounted to £839 19s. 6d., leaving an apparent surplus of assets over liabilities of £28 8s. 3d. The debtor, who was only 23 years of age, commenced business as a joiner and builder in September, 1898, in partnership with a Mr. John M'Clusky, putting in £90 of capital. The partnership was dissolved in November, 1898, the debtor taking over the assets and liabilities. According to the statement of the debtor, he agreed to buy land for 22 houses at Second Avenue, Fazakerley, at 15s. per yard. He had built and completed 12 houses, sold a chief rent on them for £1,040, and mortgaged them to a Mr. Counery, of Manchester, for £2,080. The debtor had partly built ten more, and stated that they were worth, for work done, £1,700, but he had not taken up the title. The debtor had also contracted to take land for 50 more houses on the same place, but had not commenced to erect buildings upon it. The debtor alleged that the cause of failure was inability to get advances. No offer was made on behalf of the debtor, and it was resolved to wind up the affair in bankruptcy.

In re F. Hind of Belvedere.—The statement of the affairs of Mr. Frank Hind, of Woodside, Belvedere-road, builder, contractor, and wheelwright, lately residing at No. 10, Lower Park-road, Belvedere, and carrying on business at Heron-hill, Nelson-road, and Station-road, shows a total indebtedness of £7,460 4s. 2d., of which £6,622 18s. 6d. is owing to 84 unsecured creditors, and a deficiency of £6,169 3s. 10d. The causes of failure are said to be loss on contracts, rises in prices of labour and material, and heavy interest on borrowed money. The Deputy Official Receiver remarks that "The bankrupt states he commenced business as a builder about 10 years ago at Heron-hill, Belvedere, without any capital. During the past three years the bankrupt appears to have carried on an extensive business, and has from time to time borrowed large sums from his relatives and others."

In re Neal of Daventry.—The Official Receiver (Mr. Alfred Ewen) has issued the statement of affairs in the bankruptcy of John Neal, of Daventry, contractor and builder, whose petition was presented by himself on July 27. The gross liabilities are estimated at £4,500 8s., of which £2,170 4s. 3d. is estimated to rank for dividend. The debtor expects his assets available for dividend will be £872 0s. 5d., leaving a deficiency of £1,298 3s. 10d. Mr. John Bosworth was partner with the bankrupt from January, 1890, to October, 1896. Mr. Bosworth was paid £400 to go out.

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CHIPS.

Messrs. Maudsley, Sons, and Field, the well-known marine engineers in London, have completed the sale of the site of their old works at Lambeth to the London and South-Western Railway Company, and have already acquired ground at Ipswich for a new marine engineering establishment.

In reference to the sale of plots at Southwold on Saturday last, to which we referred in our editorial columns last week, Messrs. Douglas Young and Co., the auctioneers, write that they disposed of a large number of plots to the value of over £7,000, at prices varying from £3 to £4 10s. per foot frontage. It was announced on behalf of the Coast Development Company that the construction of a pier will be at once proceeded with, and that a new boat, the *Southwold Belle*, is to be added to the already fine fleet of the company, while the train service and accommodation is to be considerably augmented.

A tablet in alabaster has just been erected in St. Laurence Church, Hawkhurst, Kent, in memory of the late Canon Jeffreys, who was vicar in the parish for 57 years. The tablet contains a marble medallion in bas-relief, by Mr. Jas. S. Forsyth. The work was executed by Messrs. Forsyth, of Finchley-road, Hampstead.

Mr. F. Wilson, a draughtsman in the City Engineer's office, has been appointed a district surveyor under the Bristol City Council. There were 27 candidates for the post, which carries a commencing salary of £180, rising to £220 a year.

The funeral of the late Mr. Joseph Davis, builder, of St. Paul's, Bristol, took place on Saturday afternoon at Arno's Vale Cemetery, in that city.

At a meeting on Monday of the Glasgow Gladstone Statue Committee, it was agreed to commission Mr. Hame Thornycroft, R.A., to execute a statue of Mr. Gladstone at a cost of £3,500. The statue will be erected in George-square, Glasgow.

A free loan exhibition of pictures was opened at Sayes Court Hall, Deptford, on Monday night, by Mr. Justice Darling. The works shown number over 200, the principal ones being "Portrait of Lord Salisbury" (Millais), lent by Mr. W. F. D. Smith; "The Boat Waited" (Caton Woodville), lent by Messrs. Cassell and Co.; "Resurrection of Lazarus" (Rembrandt), lent by Mr. W. A. P. Rowland; "Marriage à la Mode" (Hogarth), lent by Dr. E. Ezard; three landscapes by Gainsborough, lent by Mr. T. Dinwiddy; "Britomart" (Walter Crane), lent by the artist; and "Mrs. Siddons as the Tragic Muse" (Reynolds), lent by the Earl of Warwick. The Exhibition will remain open until Sunday, Sept. 3, Sundays included.

Operations were commenced on Monday for the removal of the stone bridge which carries the Caledonian railway over the Edinburgh and Glasgow thoughfare at Murrayfield and the erection of a temporary bridge, pending the erection of a new steel bridge in its place. The work is being jointly carried on by the Caledonian Railway Company and the Edinburgh Town Council, the old bridge, on account of its low arch, being a source of danger to tramway passengers. A large number of men are being employed, and the operations are under the direction of Mr. W. A. Paterson, district engineer.

The chairman of the Walsall School Board opened on Monday new schools, which have been built on the West Bromwich-road, at a cost of £8,666, exclusive of the site, and for the accommodation of 1,070 children. Messrs. Bailey and McConnel, of Walsall, were the architects, and Mr. W. Wistance, of the same city, was the builder.

The London County Council are having prepared the pedestal at the foot of Westminster Bridge and the Victoria Embankment for the reception of the "Boadicea Group" designed by the late Mr. Thomas Thornycroft. The model, in plaster of Paris, was exhibited on the same site, in December, 1897, and the permanent group, now about to be erected, is the work of Mr. Thornycroft's second son, Mr. Hamo Thornycroft, R.A.

Our Office Table.

Sir Edmund Antrobus, who succeeded to the ownership of Stonehenge so recently as April last, on the death of his father, has decided to lose no time in seeking to transfer that mysterious monument to the custody of the nation. Lest it might be supposed that he was influenced by archæological, sentimental, or even philanthropic motives, the advisers of the young baronet suggest that a price ought to be obtained which will bear comparison with the very large amounts given nowadays for works of art, and in order to make this perfectly clear, Sir Edmund asks of the Government for this relic of unfathomed antiquity, together with some 1,300 acres of surrounding land (subject to pasturage and sporting rights), £125,000—a sum which does not unduly err on the side of modesty. Whether an eighth of a million sterling, or nearly £100 an acre, is or is not a fancy price for a barren area on Salisbury Plain, it is evident that Stonehenge is unique, and for the honour of England it is desirable to make such a monument safe for all time from the danger of falling into the hands of speculators or advertisers. Doubtless the Chancellor of the Exchequer, who has just bought the Netheravon estates, on the same plain, of Sir Michael Hicks-Beach at the very satisfactory rate—for himself as vendor—of 37 years' produce of the gross rental as fixed by the arbitrators will entertain a kindly feeling towards his brother baronet landowner, and induce the Treasury to hasten to complete the bargain.

That lively and progressive seaside resort, Blackpool, has been selected as the *locale* for this autumn's Congress of the Royal Institute of Public Health, to be held between Thursday, September 21, and Tuesday, September 26. The Mayor of Blackpool, Alderman Joseph Heap, is the honorary president, the Marquis of Lorne, M.P., the President of the Congress, and Professor William R. Smith, M.D., the President of the Insitute. The programme is arranged in four sections, and, in addition, there will be five Congresses. The centre of chief interest to our readers is C, Engineering and Building Construction, which will meet on the Friday and Saturday, the 22nd and 23rd prox., and also, if necessary, on the following Tuesday. The subjects to be discussed are (1) "The Disposal of Refuse," (2) "The Statutory Registration of Architects," introduced by Mr. Ellis Marsland, the hon. secretary of the Society of Architects, (3) "Disposal of Sewage," (4) "Public Slaughter-houses," (5) "Baths and Wash-houses," (6) "Artisans' Dwellings," and (7) "National Registration of Plumbers." During the Congress there will be a Health Exhibition, and, in addition to the usual hospitalities, there will probably be included a ball and a banquet on Saturday, September 23, at which the Marquis of Lorne will preside.

Mr. William Smithard, of Derby, calls attention to an act of vandalism now being perpetrated by the Derbyshire County Council. Swarkestone Bridge, a 13th-century structure that forms a highway three-quarters of a mile in length over the river Trent and the adjoining meadows, about five miles south of Derby, is said to need strengthening, and the county council are accomplishing this by putting a round arch of blue bricks, about 3ft. thick, under the Gothic pointed arches. This new work is, according to Mr. Smithard, "not only exceedingly ugly in itself, and utterly out of keeping with the rest of the bridge, but it covers up the ribs on the soffits of the old arches, and the artistic and historic value of this unique specimen of English architecture is in imminent danger of being entirely destroyed. Protests have been made to the county council and the local archæological society, but without avail; four arches have been spoilt in this way, three others are nearly finished, and active preparations are being made to deal with the remaing seven." It is amusing to note that Mr. Smithard expects that the effect of reporting the matter to the Society for the Preservation of Ancient Buildings will be to preserve the bridge from further damage.

The persistent efforts made for some time past by Dr. G. V. Poole and by a builder resident at Eynesford, Kent, to induce the Local Government Board to relax the stringency of their model by-laws so far as to allow habitations in rural districts to be constructed of wood, have been to a certain extent successful. The Local Government Board will sanction any by-laws allowing wooden houses to be built on the following three conditions:—(1) That the house shall be of one story only; (2) that its area shall not exceed 600sq.ft., nor its capacity exceed 6,000c.ft.; (3) that it shall be 200ft. distant from any other building not being in the same curtilage. The conditions are presumably intended to lessen the risks of fire, a matter which we cannot agree with Dr. Poore only concerns the owner and the insurance companies, but the limitations of the area to be built upon are certainly very strict, and the clear space to be maintained around every wooden structure involves the isolation of each building of this class in half an acre of land, thereby obviously restricting the use of such materials to country bungalows for moneyed men living in town.

The last additions to the furnishing of St. Paul's Cathedral are two beautiful candelabra, cast in bronze from models by Mr. Henry A. Pegram, which have just been placed in the west end of the nave. The one is the gift of the Decoration Committee; the other of Mr. T. Douglas Murray in memory of his father, Prebendary Murray. The subject chosen is the Creation of the World, beginning with the three races of man at the base, and terminating, 14ft. 6in. higher, in a fiery pillar, above which is the sun surmounted by archangels, who support the rose from which springs the Cross, surrounded by stems for the electric light. The massive bases upon which the candelabra rest are each made of one block of dark Irish fossil marble weighing several tons.

The scheme for the extension of Brockwell Park has now assumed a definite form by the organisation of a strong local committee, with Mr. C. E. Tritton, M.P., as chairman, and Mr. Albert Larking as hon. secretary. It is proposed to secure the freehold of about 40 acres of ground adjoining the present park, which consists of over 80 acres, securing immediate possession of some of the property, and waiting until the leases lapse for the other. The amount asked by the landowners is, however, no less than £1,500 an acre, which cannot be considered a low figure.

The Church of England Young Men's Society in London has determined to build a "settlement house and club" at Millbank for City clerks and other young men in receipt of but small wages and with appearances to maintain. There is to be sleeping accommodation for nearly 300 of them, with a common hall, dining and coffee-rooms, library, swimming-bath, and gymnasium, as well as an employment bureau. It is estimated that the building will cost £40,000, but no lodger will be charged more than six shillings weekly, payment being regulated by the salaries of the residents. Should the home succeed, another will be established in the East End.

During the past few days excavations have been made at Hedsor, Bucks, near the bank of the Thames and the site of the ancient pile dwellings, under the direction of Mr. A. H. Cocks, of Marlow, one of the hon. secretaries of the Bucks Archæological Society. The presence of these curious relics of a Romano-Celtic character was accidentally discovered in 1894, while a cesspool was being made in an orchard, and the discoveries then made were of such an interesting character that it was determined to resume operations as soon as a fund could be raised to meet the expenses, which amount to about £3 per day. This is the only instance of pile dwellings known to exist in the South of England, with the exception of those in the lake village at Glastonbury. Since the work recommenced piles of beech have been found. The wood, though saturated with moisture, did not appear to be rotten. After being exposed to the atmosphere, however, it turned black, and shrivelled like charcoal. Bones of various animals have been found, mainly of the pig and deer.

The holding power of anchor bolts in cement, sulphur, and lead was recently investigated by Mr. R. M. Willcox at the University of Illinois. The holes were $1\frac{1}{4}$in. to $1\frac{5}{8}$in. in diameter, drilled in hard limestone, and the rods were $\frac{3}{4}$in. and 1in. in diameter. Some of them were smooth, others furnished with eight to ten threads to the inch, and some notched on an emery wheel with grooves about $\frac{1}{8}$in. deep and $\frac{5}{8}$in. wide. The Portland cement grout was made with about 25 to 38 per cent. of water and the strength of the setting was apparently unaffected by this variation. Twelve smooth rods in seven-day grout showed an average strength of 106lb. per square inch of surface of contact, three notched rods gave a mean result of 336lb. after seven days, two threaded rods gave 585lb. in seven days, and two of the same sort gave 832lb. in 14 days. With lead, four smooth rods gave 167lb., a notched rod 460lb., and six threaded rods 903lb. With sulphur, seven threaded rods gave 1,502lb., a notched rod gave 328lb., and a smooth rod 200lb.

Before the members of the Arundel Society finally concluded operations they decided that with a view to carrying out, as far as is now possible, the original purpose of the society, for promoting the knowledge of art, and in accordance with what has been from the first an essential principle of their action—namely, the avoidance of any personal benefit or profit, the entire collection of water-colour copies from ancient paintings made from time to time for the society, whether already published by means of chromo-lithography or still remaining unpublished, should be presented with their present frames to the trustees of the National Gallery upon such terms and conditions as the council may determine. It was also agreed that all the water-colour copies from ancient sepulchral monuments and those from manuscript illuminations, whether published or unpublished, together with their present frames, and also the collection of moulds and types used in the manufacture of "fictile ivories," should be presented to the Department of Science and Art upon terms and conditions to be arranged by the council.

A striking story of malfeasance, in the erection of the City Hall of San Francisco, is described in the current issue of the *News Letter* of the town. The City Hall was, it asserts "planned to cost a sum not in excess of 1,500,000dol. More than 5,000,000dol. have been expended upon it, but it is not completed yet, and at the rate at which defective work is being discovered, it looks as if it may have to be almost entirely rebuilt. Now it turns out that there are practically no ventilators in this huge building. The panels which represent the place where they ought to be are mere painted imitations, and there are no holes where they were supposed to be. How the defect is to be remedied no one at present seems to know. The lack of ventilation is already causing a good deal of sickness in the huge pile, and some day it may produce a plague. Worse even than this, it has just been discovered that the plumbing is horribly defective. The pipes do not connect with the street sewers, and in consequence are allowed to discharge themselves into a well under the building. The condition must be left to the imagination, for it cannot be described. Not long since, it will be remembered, that borings into the thick brick walls revealed the fact that the filling between the outside bricks was composed of rotten stone, sand, straw, and *débris* of all sorts. To this day it is not known how much of the walls are sound."

A resolution on the survey work in India of last year states that 26,223 miles were surveyed on all scales. Topographical operations were carried on in the Shan States and Lushai Hills and the Himalayas. Forest surveys were conducted by imperial parties in Madras, Bombay, Burma, and the Himalayas. Cadastral surveys were carried on by one party in Bengal, two in Burma, and by the local agency in the North-Western Provinces. Tidal observations, with self-registering tidal gauges, were made at thirteen stations in India, Burma, the Persian Gulf, the Andamans, and Red Sea. In Upper Burma an area of 1,752 square miles of new country was geographically surveyed. The government acknowledge the energy and success with which General Strahan maintained the efficiency of the department.

The American Section of the International Association for Testing Materials held its second annual meeting in Pittsburg, in the rooms of the Engineers' Society of Western Pennsylvania, on Tuesday and Wednesday in last week, August 15th and 16th. The first session, which opened on the Tuesday, was mainly devoted to reports of the officers and the transaction of business regarding the International Congress of 1900. In the afternoon a visit was made to the Edgar Thompson Steel Works at Bessemer. In the evening the second session was held, at which an address on the history and work of the association was delivered by the chairman, Professor Mansfield Merriman, and a report of the sub-committee on standard specifications for testing iron and steel was presented and discussed. At the close of this session a reception was given by the Engineers' Society of Western Pennsylvania. The final session, held on the Wednesday morning, August 16th, was devoted to the reports of committees on testing cement, stone, and paints, and in the afternoon excursions were made to the Pittsburg Testing Laboratory and to the works of the Westinghouse Electric and Manufacturing Co.

An expansion bolt for the use of architects, engineers, and others who require a "hidden resistance," has been introduced by Daniel C. Seaman and Co., 1638, Hutchinson-street, Philadelphia, Pa. The bolt is threaded on both ends, and the end to be fixed in the wall or similar location carries a circular nut recessed, on its inner face, to receive the outer ends of two wings which are nearly semicircular in cross-section. The wings are held in such a way as to insure the bolt from pulling out. They tighten their hold by spreading when the load is applied, and yet the bolt and fastening may readily be removed from the hole by applying a wrench to the outer end of the bolt. The chief claims made for the device are its tightness, easy application, and easy removal. It has been successfully applied to stone and brickwork, for smoke-stack guys, fastenings for fire-escapes, engine-bed bolts when secured to solid rock or masonry; also for bridge work, window and door frames and elevator guide tracks in buildings. It is stated that the bolts become firmer as the strain is increased.

MEETINGS FOR THE ENSUING WEEK.

Saturday (to-morrow).—Northern Architectural Association. Visit to Braucepeth Castle. To meet at Braucepeth Station, 2.38 p.m. on arrival of 1.47 p.m. train from Newcastle.

Trade News.

WAGES MOVEMENTS.

Amalgamated Society of Operative House and Ship Painters and Decorators.—The half-yearly report of this trade union, issued by Mr. G. M. Sunley, the general secretary, states that there has been a considerable increase in the membership, which has gone up from 9,166 in December last to 9,775. The state of trade is described as "exceptionally good," and this "has materially assisted an advance of wages" in about 28 districts, in the majority of which the advance is at the rate of ½d. per hour. Particulars are given in the report with regard to the recent dispute in the building trade, and the part taken by the Society in the negotiations for the establishment of a joint board of conciliation. It is stated that the conference held between the National Association of Master Builders and the representatives of the trade-unions was "of the friendliest character, and will, it is hoped, result in good to all concerned."

Dundee.—The strike of plasterers' labourers for an advance of wages from 5½d. to 6d. per hour still continues. The men, it is stated, are determined to remain out until they get their full demand.

Kilmarnock.—The joiners have struck work, the masters having refused to grant the demand of increase of wage from 8½d. to 9d. per hour. The employers are of opinion that the circumstances do not justify an increase. About 100 men are affected.

Leeds Building Deadlock.—A meeting of the Leeds Master Builders' Association was held on Tuesday at the Exchange Club, to consider the ballot that had been taken on the proposed settlement with the London Order of Bricklayers, which includes an advance of ½d. per hour. In the absence of the president (Mr. W. Nicholson), the chair was filled by Mr. W. H. Daws, the vice-president. It was reported that 92 papers had been sent out, and that there had been 51 returned. Of these, 48 were opposed to the advance, and the remaining three were in favour of it. Two of the three, however, were signed by members who did not employ bricklayers. After some discussion, it was decided to adjourn the meeting for a week with a view of seeing whether any further replies would be sent in.

In memory of the late Mrs. Sara Pollock Benney, of Truro, a stained-glass window has been placed in Truro Cathedral, and was unveiled on Saturday. The window occupies the western light of the north window in the retro-choir, the other half having been filled with stained glass some years ago. The Benney memorial window represents in the upper stage the figures of St. Timothy, Onesimus, and Dionysius the Areopagite. In the lower half St. Paul is represented with others laying hands on Timothy.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 0 0	,,	9 0 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20.		No. 22 to 24.
	Per ton.		Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£7 0 0	to	£8 0 0
Cast-Iron Stanchions	7 0 0	,,	8 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
" " " Galvanised	11 10 0	,,	12 10 0
Cast-Iron Sash Weights	5 5 0	,,	5 10 0
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 12 6	to	£6 17 6
4in. to 6in.	6 12 6	,,	6 17 6
7in. to 24in. (all sizes)	6 12 6	,,	6 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks.		5cwt. casks.
	Per ton.		Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 2 6	,,	17 2 6
Pig Lead, in 1cwt. pigs	15 7 6	,,	16 7 6
Lead Shot, in 28lb. bags	19 0 0	,,	20 0 0
Copper Sheets, sheathing and rods	87 0 0	,,	88 0 0
Copper, British Cake and Ingot	80 0 0	,,	80 10 0
Tin, Straits	141 12 6	,,	142 12 6
Do., English Ingots	147 10 0	,,	148 10 0
Spelter, Silesian	24 15 0	,,	25 0 0

TIMBER.

Teak, Burmah	per load	£11 15 0	to	£16 15 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	3 15 0	,,	5 10 0
,, Oak	,, ...	3 5 0	,,	4 0 0
,, Birch	,, ...	3 7 6	,,	5 5 0
,, Elm	,, ...	4 17 6	,,	5 15 0
,, Ash	,, ...	4 2 6	,,	5 7 6
Dantsic and Memel Oak	,, ...	3 5 0	,,	4 0 0
Fir	,, ...	1 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	3 15 0	,,	6 5 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5	,,	0 0 7½
,, Honduras	,, ...	0 0 4⅞	,,	0 0 4⅞
,, Mexican	,, ...	0 0 3¼	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 4⅝
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3¾
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 10 0	to	£27 0 0
,, 2nd	15 10 0	,,	18 5 0
,, 3rd	9 10 0	,,	11 0 0
Canada Spruce, 1st	8 15 0	,,	10 15 0
,, 2nd and 3rd	7 5 0	,,	8 5 0
New Brunswick	7 5 0	,,	7 15 0
Riga	8 5 0	,,	9 5 0
St. Petersburg	10 15 0	,,	12 5 0
Swedish	9 15 0	,,	10 15 0
Finland	9 15 0	,,	10 10 0
White Sea	11 10 0	,,	18 0 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 11 6	,,	£0 14 9
2nd ditto	0 10 0	,,	0 11 9
Other qualities	0 5 3	,,	0 6 6
Staves, per standard M:—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£20 10 0	to	£20 15 0
Rapeseed, English pale	,, ...	23 5 0	,,	23 10 0
Do., brown	,, ...	22 0 0	,,	22 0 0
Cottonseed, refined	,, ...	19 0 0	,,	20 0 0
Olive, Spanish	,, ...	31 0 0	,,	32 0 0
Seal, pale	,, ...	18 10 0	,,	19 0 0
Cocoanut, Cochin	,, ...	28 10 0	,,	29 0 0
Do., Ceylon	,, ...	25 0 0	,,	25 0 0
Palm, Lagos	,, ...	24 5 0	,,	24 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6¼	,,	0 0 6¼
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 18 0	,,	1 0 0
Turpentine, American	per tun	28 15 0	,,	29 0 0

LIST OF COMPETITIONS OPEN.

Otley—Isolation Hospital	£30 (merged), £15	C. V. Newstead, Clerk, Union Offices, Boroughgate, Otley	Sept. 1
Northfleet—Schools (750)	15gs.	Fredk. Mitchell, Clerk, 49, Windmill-street, Gravesend	„ 4
Dumfries—Public Library		John Grierson, Town Clerk, Dumfries	„ 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	„ 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	„ 16
Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	„ 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 31
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	Oct. 17
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Parsonstown—Water Supply (6,000 population)		H. Barlow, Clerk, Town Hall, Parsonstown	—
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—

LIST OF TENDERS OPEN.

BUILDINGS.

Pontefract—Three Houses and Shop, Monkhill-lane	John Robinson	Chas Keyworth, Architect, Bank Chambers, Pontefract	Aug. 26
Illogan, Cornwall—Reseating and Renovating Wesley Chapel		Sampson Hill, Architect, Green-lane, Redruth	„ 26
Chartham—Caretaker's House at Cemetery	Parish Council	Andrew Bromley, Architect, The Cathedral Precincts, Canterbury	„ 26
Okehampton—Post-Office, Fore-street		J. Archibald Lucas, Surveyor, Okehampton	„ 26
Luton—Police Station	Bedfordshire County Council	The County Surveyor, Shire Hall, Bedford	„ 26
Bwlch, Breconshire—Minister's House		Down and Richards, Architects, Crickhowell	„ 26
Grimsby—Factory and Premises on Fish Docks	Great Grimsby Ice Co., Ltd.	W. Readman, Secretary, Fish Dock-road, Grimsby	„ 26
North Devon—Hotel at Wooda Bay Station		G. C. Smyth-Richards, Surveyor, Barnstaple	„ 26
Durham—Range of Outbuildings on Bolam Estate	Lord Decies	T. Price, Agent, Bolam, Belsay, Newcastle-on-Tyne	„ 26
Tipperary—Three Houses, Main-street		W. H. Hill and Son, Architects, 26, South Mall, Cork	„ 26
Chesterfield—Board Schools and Swimming-Bath	School Board	Tiltman and Jackson, Archts., 29, Knifesmith Gate, Chesterfield	„ 28
Godalming—Municipal Buildings	Town Council	Lanchester, Stewart, and Rickards, Archts., 1, Vernon-pl., London	„ 28
Aber, near Caerphilly—Board Schools	Eglwysilan School Board	J. H. Phillips, St. John's Chambers, Cardiff	„ 28
Shipley—House and Stable, Keighley-road		Abm. Sharp, Architect, Albany Buildings, Market-st., Bradford	„ 28
Ashford—Pumping Station and Cottage	Rural District Council	Bailey-Denton, Son, & Lawford, MM.I.C.E., 9, Bridge-st., Westmnstr	„ 28
Falkirk—Cemetery Works	Parish Council	A. and W. Black, Architects, Falkirk	„ 28
Clayton-le-Moors—Sprinkler Tower	Enfield Spinning Co., Ltd.	H. H. Wilkinson, Secretary, Albert Mill, Clayton-le-Moors	„ 28
Halifax—Extension of Engine-Room, &c.	Borough Council	W. H. D. Horsfall, F.I.A.S., Tower Chambers, Silver-st., Halifax	„ 28
Stone, Staffs—Alterations to Laundry at Workhouse	Guardians	J. J. Chapman, Architect, Tunley-street, Stone	„ 28
Leeds—Heating-House, &c., at Cross Flatts Park		The City Engineer's Office, Municipal Buildings, Leeds	„ 29
Braithwaite—Alterations to Old Pencil Mills	J. Skelton	James Howes, Architect, 23, Curwen-street, Workington	„ 29
Frizington—Additions to St. Joseph's Schools		J. S. Stout, Architect, Gillfoot, Egremont	„ 29
Leeds—Heating-House, &c., at Holbeck Cemetery		The City Engineer's Office, Municipal Buildings, Leeds	„ 29
Wroughton—Barn, Stables, Cattle Sheds, &c.	Lieut.-Col. T. C. P. Calley	Robt. J. Beswick, M.S.A., Architect, 9, Regent-street, Swindon	„ 30
Morley—Offices, Stores, Engine House, Boundary Walls, &c.	Sewage Purification Committee	W. E. Putman, A.M.I.C.E., Borough Engineer, Morley	„ 30
West Brompton, S.W.—Works to Chimney Stacks, Caps, &c.	St. George's Union Guardians	Edwin T. Hall, F.R.I.B.A., 57, Moorgate-street, E.C.	„ 30
Malvern—Sanatorium	Urban District Council	The Surveyor's Office, Malvern	„ 30
Farnham—Rebuilding the Grenadier Public-House, Heath End	Army and Navy Co-op. Breweries	Friend and Lloyd, Architects, Aldershot	„ 30
Whitehaven—Alterations to 19 and 20, King-street	A. Wilson	J. S. Moffatt, M.S.A., 53, Church-street, Whitehaven	„ 30
Sunderland—Pulling Down Buildings in Hat Case Area, and Erecting Three Blocks of Workmen's Dwellings	Corporation	The Borough Surveyor's Office, Town Hall, Sunderland	„ 31
Liversedge—Branch Store and Five Houses, Union-road	Heckmondwike Indus. Co-op. Soc.	Castle and Son, Architects, Bank Buildings, Heckmondwike	„ 31
Monaghan—Enlarging Presbyterian Church		Forster Dunwoody, J.P., Monaghan	„ 31
Bridlington Quay—Eight Houses, South-street	E. Mainprize	J. Earnshaw, Architect, Carlton House, Bridlington Quay	„ 31
Plymouth—Laundry, &c., Mount Gould-road	Sanitary Committee	Geo. D. Bellamy, Consulting Engr., Courtney-st., Plymouth	„ 31
Alverthorpe—Storeroom and other Buildings at Mills		C. S. Nelson Architect Sun Buildings, 15, Park-row, Leeds	„ 31
Rostrevor—Home of Rest	Girls' Friendly Society Committee	W. James Watson, M.R.I.A.I., Architect, Rostrevor, Ireland	„ 31
Cardiff—Additions to 75, 77, 79, and 81, Queen-street	G. A. Seccombe and Co.	James and Morgan, Architects, Charles-street Chambers, Cardiff	„ 31
Linthorpe—Eleven Pairs Semi-Detached Villas, Phillips-avenue		Arthur F. Newsome, M.S.A., Architect, Albert-road, Middlesbrough	„ 31
Bradford—Thirty-three Houses, Folkestone-street	Provident Industrial Society, Ltd.	Rycroft and Firth, Architects, Manchester-road, Bradford	„ 31
Manchester—Storage Warehouse, &c., Poland-street	Corporation	Joseph Swarbrick, Architect, 33, Brazennose-street, Manchester	„ 31
Putney—House	G. H. Chapman	Hatfield and Hawes, Architects, 152, High-street, Putney	„ 31
Leeds—Congregational Sunday-School, Woodsley-road		G. F. Danby, Architect, 10, Park-row, Leeds	„ 31
Ardrossan—Cemetery Extension Works	Parish Council	Allan Gilfillan, Architect, Ardrossan, N.B.	„ 31
Swindon—Shops, Devizes-road	Chandler Bros.	W. H. Read, M.S.A., Architect, Corn Exchange, Swindon	„ 31
Easingwold—Vicarage House at Husthwaite		C. Hodgson Fowler, F.S.A., Architect, Durham	„ 31
Irvine—Academy	School Board	John Armour, jun., Architect, Irvine, Scotland	Sept. 1
Bristol—Offices, Broad-street	Corporation	T. H. Yabbicom, M.I.C.E., 63, Queen-square, Bristol	„ 1
Malmo—Electricity Works		The Gasworks Directors, Malmo, Sweden	„ 1
St. Albans—Additions to Premises, Victoria-street	Corporation	The City Surveyor's Office, St. Albans	„ 1
Loughborough—Two Houses, Park-road	J. Bennet and T. A. Hubbard	Albert E. King, Architect, Baxter Gate, Loughborough, Leicester	„ 2
Cowling, Yorks—Stores	Beehive Co-operative Society	James Hartley, Architect, Skipton	„ 2
Selby—Pointing, &c., Waterworks Tower and Chimney	Urban District Council	Bruce McG. Gray, A.M.I.C.E., Town Hall, Selby	„ 2
Falkirk—Tenements, Main-street, Camelon	Heritable Property Co., Ltd.	John P. Goodsir, Architect, Newmarket-street, Falkirk	„ 4
Leeds—Dwelling-House at Meadow-lane Gasworks	Gas Committee	R. H. Townsley, General Manager, Municipal Buildings, Leeds	„ 2
Sowerby Bridge—Two Warehouses at Calder Oilcloth Works		Jackson and Fox, Architects, 7, Rawson-street, Halifax	„ 4
Hellingly, Sussex—Foundation Works for Asylum	Visiting Committee	G. T. Hine, F.R.I.B.A., 35, Parliament-street, Westminster, S.W.	„ 4
Padiham—Technical Institute	Urban District Council	Henry Ross, Architect, Cannon-street, Accrington	„ 4
Enfield—Schools, Chase Side	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	„ 5
Sandgate, Kent—Wesleyan Church and Schools		Gordon, Lowther, & Gunton, Architects, Bloomfield-street, E.C.	„ 6
Ealing—Extension of Coverings at Ealing Station	Great Western Railway Co.	The Engineer, Paddington Station, London	„ 6
Cwmaman—Eleven Houses	Mount Pleasant Building Club	J. Llewellin Smith, Architect, Aberdare	„ 6
Mallow—Repairs to Cottages, &c.	Rural District Council	Maurice Regan, Clerk, Workhouse, Mallow	„ 6
Westbury—Passenger Station, Goods Sheds, &c.	Great Western Railway Co.	The Engineer, Bristol Station	„ 6
Ballycrovane—Coastguard Station		The Carpenter-in-Charge, Queen's College, Cork	„ 7
Devonport—Buildings for Working Classes	Town Council	John F. Burns, Borough Surveyor, 30, Ker-street, Devonport	„ 7
Darwen—Post Office		J. B. Thornley, Architect, Darwen	„ 8
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	„ 12
Bermondsey, S.E.—Alterations to Town Hall	Vestry	The Surveyor, Town Hall, Bermondsey	„ 13
Dukinfield—Offices, &c., at Disposal Works	Joint Sewerage Board	J. Newton, Son, and Bayley, Engineers, 17, Cooper-st., Manchester	„ 13
Carlisle—New Vicarage, Irthington		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	„ 18
Paddington, W.—Alterations to Woodfield House, Woodfield-rd.	Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	„ 27
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	„ 30
Cumberland—Cutting Foundations at Clifton Colliery		J. Gilchrist, Clifton Lodge, near Workington	—
Senghenith—Business Premises, Commercial-square	J. Jones and J. Morgan	E. H. Bruton, F.R.I.B.A., Architect, 15, Queen-street, Cardiff	—
Widdrington—Alterations to Co-operative Society's Premises		James Haigh, Widdrington Colliery Office, Widdrington	—
Essington—Artisan's Dwellings		John Weller and Sons, Architects, Wolverhampton	—
Thornton Heath—Chapel, Parchmore-road	Wesleyan Chapel Trustees	Frederick W. Ledger, Architect, 8, Philpot-lane, E.C.	—
Leeds—Taking Down Part of 88 and 90, North-street		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Romiley—Alterations to Grey Horse Inn		Burton and Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Whaley Bridge—Eight Houses	Co-operative Society	C. W. Johnson, Architect, Whaley Bridge	—
Flookburgh—Shop and House		J. Slater, Flookburgh, Lancs	—
Tunbridge Wells—House		J. F. Bull, Surveyor, 30, Bedford Row, London, W.C.	—
Maidstone—Mills	W. J. Mackey	Hubert Bensted, Architect, Maidstone	—
Grays, Essex—Alterations to Co-operative Stores		Christopher M. Shiner, A.R.I.B.A., 3, Bond-court, Walbrook, E.C.	—
Dewsbury—Rebuilding Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Littleborough—New Works	Phœnix Ironworks Co.	F. H. Shuttleworth, Archirect, Littleborough	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Selby—Alteration of Premises	Yorkshire Banking Co., Ltd.	James Young and Co., Architects, 62, Market-street, Bradford	—
Leeds—Alterations to General Infirmary		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Dewsbury—Restoration of Schools	School Board	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
New Tupton—Church Institute, Sunday-School, and House		Ernest Oxley, M.S.A., Architect, Clay Cross	—
Chepstow—Rebuilding 29, High-street	C. Curtis	W. Robinson, Architect, King-street, Hereford	—
Tooting, S.W.—Flats		J. Theobald, Architect, 26, Budge-row, Cannon-street, E.C.	—
Morecambe—Altering House into Business Premises	Lancaster and Skerton Co-op. Soc.	Marshall Bros., Architect, Back-crescent, Morecambe	—
East Kirkby—Extension to Co-operative Premises		Lawrence Bright, Architect, 9, St. Peter's Church-walk, Nottingham	—
Cainscross—Extensions to Bakehouse	Cainscross and Ebley Co.-op. Soc.	The Society's Office, Cainscross, Glos.	—

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
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FRIDAY, SEPTEMBER 1, 1899.

ARCHITECTURAL ENVIRONMENTS.

A LINE of stately civic palaces, legal, scholastic, and commercial, fringing the silent highway of the Thames, has been the dream of many an enthusiast. The ideal is at least partly realised; all along the Victoria Embankment from Charing Cross to Blackfriars palatial blocks of buildings have been erected or are in course of construction, and this important addition to the architecture of the Metropolis will naturally be taken to represent the best art of its kind. The site is unrivalled in London, or in perhaps any other European capital. A frontage to a noble promenade and river, ample width and depth, and an extended perspective, leave very little to be desired. It was a grand opportunity for the display of architectural talent which will probably seldom occur again. Can it be said that the most has been made of the opportunity? The architects have here been less restricted than elsewhere in their lines of frontage; they could build to a reasonable height, and in most cases the best materials have been used. Everyone has been allowed free liberty to adopt any style he chose. All the known modern styles have been tried, and by reputed leaders of the profession. We have first, in point of date, the late Professor E. M. Barry's ambitious French Renaissance in the Temple; facing the Embankment Gardens there are two large hotels, the "Cecil" and the "Savoy," the former a towering elevation of a very flat veneered kind of modern Renaissance, then a Medical Examination School of commonplace design; east of Waterloo Bridge come the piles of red brick hotels and offices and residential chambers in Surrey, Norfolk, and Arundel-streets, all designed in a Tudor Gothic, or English Renaissance style; the pretentious offices of the London School Board in the last-named style scarcely equal to their importance and position, though the fact that four architects were successively employed on the pile had much to do with the ineffective result; then a small block of offices in a Late Tudor style by a leading Gothicist, while further eastwards we have Sion College, by Sir Arthur Blomfield, A.R.A.; the Thames Conservancy Offices, by Messrs. Hunt and Steward, a large, Gothic structure in red brick and stone; the City of London Schools in a massive Classical style of French character; and there will soon be completed three other blocks of buildings of pretentious design which will fill up the gap so long open next to Sion College. We are scarcely able to judge yet of these latest buildings. The most important of them is the large pile in course of construction, nearly finished, next to Sion College, for the offices of the Metropolitan Asylums Board, of which we gave a view and plan Aug. 26, 1898. The architect, Mr. Edwin T. Hall, F.R.I.B.A., has ingeniously disposed his plan. The board-room is a flattish-shaped octagon towards the Carmelite-street front, and the entrance and main staircase is placed at the angle between this and the Embankment. But it is rather of the external features that we now speak. The architect has adopted a French Renaissance, with semicircular bays, two on each front, which are carried up and finished as low spherical cupolas. These are covered with copper, and the two tourelles flanking the entrance are engaged or united with a lofty Mansard-shaped roof, the summit of which is terminated by a small copper-covered flèche. These round cupolas and the high-hipped roofs give a broken sky line to the building, and define the main front; but the roof flèche looks a midget in smallness near the cupolas and flèche of the City of London Schools, and the building looks dwarfed under the high roof of the adjoining buildings. The materials are red brick facings relieved by Portland stone. These are disposed in alternate courses on the ground story. Till the scaffolding is removed it is impossible to say how this building will unite and harmonise with the existing structures on either side. Two other buildings of stone are being erected westward of this, on each side of Temple-avenue, both of Classic or Renaissance design, which can hardly be said to harmonise with this block. The westernmost of these is for the new offices of the Employers' Liability Corporation, and is of Portland stone entirely. The block on the east side of street is also of stone, and has some good Classic rusticated window ordinances; but both buildings are too incomplete to allow one to form any opinion on the architectural *ensemble* of this group. The last building is of fireproof construction, and Messrs. Mark Fawcett and Co. are carrying out this branch of the work. As far as we can form any conclusion at present, these new edifices are too closely set to enable each design to be seen in its integrity. Where uniformity of design is impossible, a row of palatial buildings like these should be sufficiently separated for each to be seen as a distinct design. We cannot expect perfect harmony. Each architect will prefer his own treatment even of the same style; one will adopt large fenestral openings, another small; one prefers a more severe, another a less rigid character; one has a preference for varied skyline, another for a moderately pronounced roof, and these differences render a close setting objectionable. We should have had a more successful line of buildings if there had been wider spaces between them. There seems to be a law that the closer they are the greater is the necessity for more uniformity or harmony. One thing must be remarked by all foreign visitors and critics—the strange diversity in the designs, Gothic and Classic in close connection. National eclecticism in style is shown here as much as in our streets. The variety produces an element of picturesqueness on the Embankment which the most eager advocate for that quality would approve. Late Tudor and Gothic with the most modern attempts at Renaissance are brought into close proximity, strangely evincing the national sympathies for those styles. We might indeed imagine, but for their evidently modern look, that the Embankment displayed a consecutive development of our national architecture from the 15th to the 18th century; they at least show the two styles which have received most favour, and have survived other developments. It would have indeed been a strange medley if Early and Late English, French, and Venetian Gothic, "Queen Anne" and other revivals had been represented. We have been spared such an exhibition of our electicism; what we here see are examples of some of our modern leaders in both the popular styles. Sion College is at least as good a specimen of modern Gothic as we can have; the Thames Conservancy Offices are even more a compromise, and breathe the spirit of a commercial 19th-century Gothic; both these blocks adjoin, and a comparison of their merits is thereby invited. It is rather a pity they should have been built side by side; the tall four-story Conservancy offices rather spoil the gable end of the College by confusing the outline. We take exception to the too florid carving under the flat bay window, and to the row of pointed cusped window-heads of the ground story, which are not in character with the Later detail of the upper story, which reposes awkwardly upon them. Comparing these Gothicised structures with the blocks of red brick Tudor Gothic of the Arundel Hotel and the adjacent houses, we may note another modernised version of the style for offices and flats, a very strained adaptation; they, at least, prove that Gothic is not yet a defunct style among us.

Between the Embankment and Tudor-street a number of new buildings have been erected in stone and brick. The School of Music is flat and uninteresting; large printing and publishing offices, and other blocks of rather ambitious design are here erected, which we must designate under the very elastic term of "Renaissance," for lack of a better name. These show how the modern architect can adapt art to the commercial requirements. The whole area, indeed, occupied by the old gasworks has been practically rebuilt during the last few years—not in the best or most tasteful way, for we should not have had the sweep of a huge hotel of very ordinary architecture to commence this end of the Embankment and join abruptly to a large scholastic building, but still in that thoroughly English fashion which unites the extremes of art and business.

In Fleet-street we see the beginning of a remodelling era destined before long to be general. In the rebuilt stone premises of Messrs. Barclay and Co., Ltd., of which Mr. Arthur C. Blomfield is the architect, a reasonable effort is made to break through the monotony of a straight frontage by a bold recess between two projecting wings; the recessed part is adorned by engaged Ionic columns with entablature running through the whole façade, and a high attic story over. The front is restrained and quiet, but official, and the only decoration is some well-carved tympana over the first-floor windows. The festoons of foliage are artistically done, and enrich the broken pediments and the otherwise plain stone façade. At the Fleet-street end of Bouverie-street, a large excavated site shows a considerable rebuilding is about to commence. Our City architecture is in a very tentative stage. What with the "setting back," the desire to avoid the bare party-walls on each side of a building so retired, and the attempt to produce a little effect, we may expect to see a few departures from the old method of rebuilding. "Necessity is the mother of invention," and we may hope for improvement. Our streets are deploringly dull and uninteresting as they are.

Important professional societies are endeavouring to be up to date, and emphasise their local habitations, and there are two buildings erected within a few hundred yards of each other that indicate how different architects have dealt with the architectural problem. The Surveyors' Institution in Great George-street, from the designs of Mr. A. Waterhouse, R.A., is a bold attempt to treat in a brick style a building of this kind. Lofty mullioned square-headed windows, with a bold corbelled cornice, and ornamental dormer, are features of the front. The materials of Ruabon bricks and Ancaster stone were selected to resist the destructive and discolouring action of the atmosphere. When we compare this building with the Institution of Mechanical Engineers designed by Mr. Basil Slade, facing St. James's Park and the new Admiralty Buildings, we are struck by the more ambitious Classic design attempted in the latter. The material is chiefly Portland stone of brown colour, and Midland red brick facings; but the design is essentially a stone treatment. There is a little lack of unity in the main façade, the salient part of the design being the corner crowned with a square cupola. Owing to the foundations being built in running water about 20ft. deep, the basement floor is laid on a kind of concrete inverted tank, the concrete walls having through them terracotta pipes for the circulation of the water.

What effect the new Government Offices

will have in quickening the desire to rebuild old premises in this neighbourhood remains to be seen. Whitehall and the purlieus round Westminster have long been exceedingly dull and uninviting in spite of their more favoured surroundings. Nothing could have been more depressing than the dull semi-official buildings of the old Government departments, with their unfinished façades, their want of sculptural ornament, and the flat monotony of the skylines. There is now an opportunity to redeem this dreary condition—to give a little more life and beauty to the environment, if only the narrow official mind awake to its position and its inaptitude be shaken off, and a spirit to understand the requirements of the age and its demand for art and toleration of ideals be encouraged.

WHAT IS A BUILDING?

THE legal and technical definition of a building is still a disputed and undecided question. Notwithstanding the legal decisions that have been given on the point, summonses still continue to be taken against persons who either ignore the law or interpret it in another way. From an architect's point of view, a movable wooden shed or box 8ft. 2in. by 6ft. 2in. could not in any case be called a "building"; it has no proper foundations, not being "let into" the ground, but simply one resting on timbers on the ground. Various judicial interpretations have confused the issue, and made the meaning less certain. A structure of wood 16ft. by 13ft., and intended to be permanently used as a shop, has been ruled to be a "building" under 18 and 19 Vict. c. 122, although not let into the ground, but merely laid upon timbers upon the surface ("Stevens v. Gourley"); a bay window has been held to be a building, also a high wall, &c. The definitions given are rather vague, and as they appear not to take any account of the material or the mode of fixing or resting on the ground, the difficulty of deciding is increased, or rather every structure or inclosure would appear to come within the designation. By making it clear that a building must have a built foundation of brick or stone let into the ground, or that it is not entirely of wood, a definition might be framed that would simplify the question and exclude all wooden structures. But the law, in these cases, likes to be indefinite; and the attempt has been to frame a law that will draw a distinction without a difference.

A case was reported in our last, in which several persons were summoned at Southend by the corporation for erecting buildings on some land without depositing plans. One of the cases was first taken. These structures were described as "lock-up shops," 8ft. 2in. wide, and 6ft. 2in. deep, and 7ft. 6in high. Evidence was called to prove that in one case it was only temporary, and was to come down at the end of the season. It was not attached to the ground in any way, and could be lifted by two men. One builder called described one of the erections as merely a "show-case." The bench decided it was not a building within the meaning of the by-laws, and the summons was dismissed. The other summonses were adjourned to abide the result of the appeal.

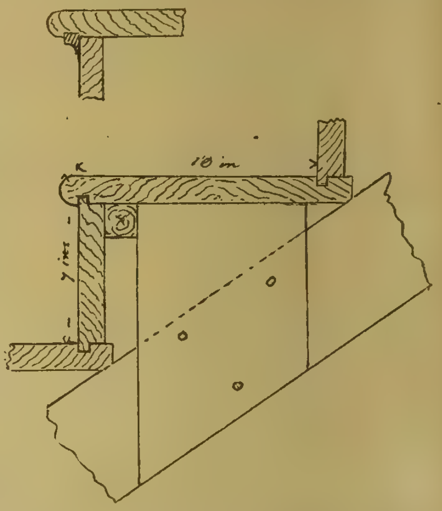
The argument used by the town clerk was that to comply with the law a building must be temporary *ab initio* and throughout its existence, but that these structures were to be used as shops. This argument was based on a decision that where a building was conveyed to its destination on wheels, and the wheels were then taken off, it was a building within the meaning of the Act. These arguments do not appear to be conclusive. The very fact that a structure is conveyed on wheels to its position ought to be convincing. It is remarkable that there should be no definition of a building in the Metropolitan Building Act, and, although one was inserted in the Bill, it was not carried; indeed it would seem that the difficulty of framing a satisfactory definition has been felt. A similar difficulty has been to decide what is a "new" building under the Public Health Act, and the definition given "the re-erecting of any building pulled down to or below the ground-floor, &c.," has been very differently interpreted; the difficulty in this case being as to what is meant by the words "ground floor," whether the actual floor level, or the cube space contained by the walls, floor, or ceiling; though, of course, the latter sense is the right one. But the term "building" has been debated again and again, and no further approach to a satisfactory definition has been made. One decision is that already referred to—viz., that a structure of wood of considerable size intended to be permanently used as a shop, is a building, although not let into the ground—a definition so far satisfactory, as it excludes a number of similar structures that are not permanently used, and are of small size. We shall await with interest the appeal to the High Court as to the other cases, when we trust a more conclusive ruling will be given. The importance of deciding the question is evident. Of course, the objection to wooden structures being erected that are exempted from the operation of the Act is a sound one, as such indiscriminate building may ignore all sanitary arrangements, gas or water-pipes. No doubt these erections, too, are often a nuisance and objectionable; at the same time, in many cases they are necessary and convenient when they do not interfere with other buildings. For temporary offices and shops they are useful when there are no unnecessary risks involved, such as nearness to other buildings, or when not of any great size or divided into rooms. A limit as to size is essential. The framers of the London Building Act, in the Bill stage, inserted a definition of "building," but it was struck out because of its indefinite character, for it would practically include every inclosure of space of whatever material, whether wholly inclosed or not, or whether with permanent foundations or not. The local by-laws vary in their construction and the interpretation put upon them, so that it is not easy to say what a building really is within them. Builders, property owners, as well as architects, are interested in the question. The ordinary man cannot exactly understand why the term building should be made to comprise every conceivable class of structure, whether of brick, stone, or wood, whether for temporary or permanent use. At least, one believes that a building should be a substantial and permanent erection, fixed to the ground and built from it, not a structure that can be put together in one place and transported to another for a temporary purpose. This is the common impression, but it is apparently not evident to the legal technical mind.

ESTIMATES.—XIX.

MOULDINGS—STAIRCASES, ETC.

IN pricing mouldings, architraves, cappings, &c., much will depend on the quantity. With a machine, as a four-cutter moulding machine, the various labours in moulding and rebating, &c., can be done in one operation, and a trifle added for cleaning up. But the cost of a set of irons, two irons to each cutter-block, would add to the price of any small quantity. Before pricing, obtain a list of steam-made joinery as supplied at the London warehouse. The prices of mouldings are charged at per 100ft. run. An architrave moulding 2in. by 1in., an ordinary size, is quoted in one list at 6s. 7d. per 100ft. run, about ¾d. a foot; one 3in. by ⅞in. at 8s. 7d., or about 1d. per foot. A bold architrave moulding 6½in. by 1¾in. is priced at 26s. per 100ft., or about 3d. per foot run. A torus skirting 4½in. by ⅝in. cost 9s. 8d. per 100ft., and a moulding 7in. by 1in. 15s. per 100ft. run. These prices are much lower than those we have given on page 221.

When there is a rebating and a single-cutter moulding machine a considerable reduction in the price of mouldings of this kind can be made—at least 15 to 20 per cent. in a large quantity of several hundred feet. Having obtained the price of moulding, the cost of fixing and mitres must be added. For fixing we may use the constant ·005ft. run or ½d. per foot, for mitres add 20 per cent. if frequent. For moulding the constant is ·072 per foot super., or 7¼d.; so that a moulding of 4in. super. would be about 2½d., and an 8in. moulding about 5d. a foot super.; but these prices are only approximations. Special mouldings are struck by the hand, and circular mouldings, as in a door in a circular wall, is priced four times as much as the straight, and the cost increases as the radius decreases. The pricing of mouldings depends a good deal on the number of the quirks, each extra quirk adding to the cost.



270ft. run. 2¼in. by 1in. moulded architrave and mitres.

This moulding may be had, if a stock pattern, at about 8s. per 100ft.

	£	s.	d.
One foot at above price, say	0	0	1
Waste, 10 per cent.	0	0	0¼
Mitres	0	0	0½
Fixing and nails	0	0	1
Per foot run	0	0	2¾

320ft. run. Architrave formed on ¾in. by 4½in. beaded grounds and 2½in. by 1in. moulding.

Add to the cost for narrow grounds, say, 3d. For moulding, the price, if steam-made, would be about 8s. per 100ft., say 1d. per foot; mitres ½d., fixing say ½d. per foot; say, 5d. per foot.

60ft. super. Moulding 6in. girt, or capping for dado, rebated to framing, according to detail.

This would be worked by hand, and may be priced at about 2s. per foot super.

1,200ft. run. Wrought ¾in. narrow framed and splayed grounds for architraves.

	£	s.	d.
Say, 3in. of ¾in. deal (3 out of a deal)	0	0	0¾
Planing face and edges (one edge)	0	0	1½
Framing stiles	0	0	0⅛
Fixing	0	0	0½
	0	0	2¾

30ft. run. 5½in. by 1¼in. rounded window-board, ditto with small moulding tongued under.

The price per foot run of window-board would be about 4d. per foot. Add 1d. for moulding and tonguing in.

No. 24. Mitred ends to ditto, and notching.

These would be notched round the architraves, and may be priced at 4d. each.

STAIRCASES.

In valuing staircases, the various items may be severally taken off and priced, the principle of doing which may be explained by taking a deal stairs of ordinary construction with 1¼in. treads, rounded nosings, 1in. risers, rebated and grooved together, blocked and glued, with brackets on fir carriages. Suppose the steps are each 3ft. long, with 10in. "going," and 7in. riser. For measuring, girth the riser and tread by the length of step = 10in. + 7 = 1ft. 5in. × 3ft. (See sketch.)

			£	s.	d.
3 0 0 11	2 9	1¼in. deal tread at 2¾d. ...	0	0	8
3 0 0 8	2 0	1in. deal riser at 2¼d.	0	0	4½
3 0	3 0	Cross-tonguing joint ·015 = 1½d.	0	0	4½
4/3 0	12 0	Labour grooving and rebating treads and risers (constant ·006) say.........	0	0	6
3 0	3 0	Labour rounded edge, ·006	0	0	1½
1 1		Deal blocking 1¼in. square, say	0	0	2
0 5	0 5	Rough deal carriage, 13in. by 5in. by 2½in., say	0	0	1½
		Deal brackets, say	0	0	1
		Planing tread and riser, say 4ft. 6in. super., ·010, say	0	0	4½
			0	2	9½
		Divided by super., say	0	0	6½
		Fixing (·045), glue and nails, say	0	0	6
		Cost per foot super.	0	1	0½

Laxton prices this at 1s. 2d. per foot.

In measuring staircases, the best plan is to take the length of flights on plan, adding 1in. to each tread; and, for the risers, to take the height from floor to floor, allowing ¾in. to each for tonguing.

The following constants for labour may be used:—For fixing treads and risers, ·045 per foot super., or, at current rate of wages, about 4½d. per foot. For housing treads and risers, rounded nosings, ·050, equal to about 5d. each; if with moulded nosings, 6d. each. These are high prices; 3d. and 4d. is enough.

For housing winders, rounded nosings, each ...	·075 = 7½d.
" " moulded " " ...	·090 = 9d.
Fixing wall string, per foot super.	·020 = 2d.
" outer " " "	·010 = 1d.
For fixing newals, per foot run	·025 = 2½d.
" handrail " "	·006 = 0½d.
For rounded edges to treads, per foot run	·006 = 0½d.
For moulded " " over 2in. girth, per foot super.	·072 = 7½d.

Pitch pine is often used for good staircases. The pine is imported in logs and planks, and the joiner generally converts the latter. The average price of pitch pine is about equal to that of good deals; sawing may be taken at about one-third more. ¾in. will cost about 1¾d. or 2d. a foot, 1in. about 2¼d. per foot, 1¼in. about 2¾d., 1½in. 3¼d. per foot. Mr. Leaning, whose notes on this wood are valuable as a guide, says 1d. per foot super. will cover the additional cost. For floors, staircases, and jamb linings, the labour is worth about 25 per cent. more. Compared to wainscot, the value of labour and materials is about one-half. For door or other framing, the labour constant for pitch-pine is 50 per cent. more than that for deal, which gives about 33 per cent. A 1¾in. square framed door of deal is about 7½d.; in pitch-pine the price would be 10d., the material being the same in both cases, or 2¾d.

82ft. super. 1in. deal wrought staircase, with rounded treads and risers, glued, blocked, and bracketed for plastering.

This may be priced at 9d. to 10d. per foot. If including for carriages, add 1½d. per foot.

110ft. super. 1¼in. yellow deal ditto, treads and risers, with moulded nosings, glued up and blocked to close string and fir carriages.

For extra thickness of risers, add per foot super. ½d; for moulded nosings (constant ·072), add 5d.

	£	s.	d.
Cost of deal staircase, as before	0	1	0¼
Extra thickness on risers	0	0	0½
Moulded nosings, per foot	0	0	4
	0	1	4¾

Say, 1s. 5d. per foot. This is sometimes priced at 1s. 6d.

100ft. super. Ditto ditto, mitred to cut string, and dovetailed to balusters.

Add 3d. or 4d. to last item.

No. 20. Returned moulded and mitred nosings.

There is considerable labour in one of these, and they may be put at 8d. each.

110ft. super. 1¼in. deal staircase, ditto with moulded nosings, mitred to string-board, and dovetailed for balusters and winders with one circular end.

The extra labour in mitring to winders would be equal to another additional 3d. a foot, say 1s. 10d.

No. 15. Returned moulded and mitred nosings tongued to tread.

Put this down at 2d. more than former item, say 10d. each.

No. 1. Curtail step and riser.

There is extra labour blocking and veneering. Price this at from 8s. to 10s., according to design.

20ft. super. 1in. deal outside string, framed, rebated, sunk, and beaded.

	£	s.	d.
Cost of 1in. deal, say	0	0	2
Framing (·040) per foot super	0	0	4
Rebating and sinking, say	0	0	1½
Beading	0	0	0¼
	0	0	7¾

Say 8d.

22ft. super. 1¼in. deal outside string-board, framed, rebated, sunk, and beaded.

Add another 1½d. per foot for extra thickness.

Ditto 1¼in. ditto, and moulded.

Add another 3d., or say, 1s. 1d. per foot.

Ditto ditto, mitred to risers.

This extra labour would add another 2d.

Ditto, ditto, wreathed.

The labour is considerable. For plain work the price per foot run is about 4s. 6d. for a small quantity.

98ft. super. 1¼in. wrought-deal treads and risers, glued and blocked with moulded nosing, and returned, ditto with winders.

Price this as before, add for winders 2d. The cost of stairs of this description, with nosings mitred to string-board as above, is 1s. 10d., including winders, say, 1s. 11d.

If there are cut brackets, price each at 1s., unless they are elaborate in design.

112ft. super. Pitch-pine stairs, 1¼in. treads and 1in. risers, glued up and blocked to close string, nosings, and fir carriages.

If the price of labour on pitch pine is 25 per cent. more than for deal, then if a deal stairs cost 1s. 5d. per foot, we may add 4¼d. = 1s. 5d. + 4¼d. = 1s. 9¼d. per foot. Laxton says pitch pine is about ⅛th more than deal, and the labour another ⅜ths, and this makes the cost 50 per cent. more.

FRAMINGS, ETC.

16ft. super. ¾in. ledged doors.

Worth about 6½d. per foot super, or—

	£	s.	d.
Matched battens ¾in., say	0	0	1½
Labour making	0	0	2½
Ledges	0	0	1
Nails	0	0	0¼
Hanging	0	0	0½
	0	0	5¾

With profit, say 6½d.

6ft. super. ¾in. ledged trap-door to roof.

This being below average size, is worth 25 per cent. more, say 2d. = 8d.

20ft. super. ¾in. ledged cistern cover and bearers.

Add to last 2d. for bearers.

10ft. super. 1¼in. square-framed dwarf cupboard door, hung folding.

Price this at about the same, 8d. per foot.

10ft. super. Ditto moulded one side.

Add 1d. for moulding one side, say 9d.

30ft. super. 2¼in. two-panel door, lower panel moulded one side, and bolection moulded; upper panel with diminishing stiles, rebated, with mouldings for glass.

	£	s.	d.
Say cost of 2in. four-panel door is	0	0	10
Extra thickness	0	0	1
Loose mouldings top panel	0	0	1½
Bolection moulded bottom panel	0	0	1
Plain moulding	0	0	0½
Per foot super.	0	1	2

The diminishing stiles would cost a little more; but as there is only one panel instead of four, it is about equalised in cost.

30ft. super. 1in. shelves on bearers, plugged to wall.

	£	s.	d.
1in. deal, say	0	0	2
Planing sides (constant ·010)	0	0	2
Bearers and fixing	0	0	2
Per foot super.	0	0	6

60ft. super. 1¼in. ditto, cross-tongued, &c.

	£	s.	d.
Cost of 1in. shelves	0	0	6
For extra thickness add	0	0	1
Cross tonguing (·015)	0	0	1½
Per foot	0	0	8½

"BUILDING NEWS" DESIGNING CLUB.

A PAIR OF SEMIDETACHED VILLAS.

SUBURBAN houses have greatly improved no doubt in many ways of late years; not so much in external appearance, perhaps, as in accommodation and in adroitness of planning. The speculating builder naturally enough has little idea of artistic charm, and his productions usually are as devoid of good proportion as they are replete with vulgar pretentiousness; but it must be admitted that very often he manages to obtain the utmost amount of convenience within as restricted a space as can very well be contrived. Added to this, the speculating contractor realises the public appreciation of show. This is satisfied by a few tesselated pavings in forecourts or porches, some chequered glazings in front door and side windows, a fancy chimney-piece or two, and some overdone detail in thin woodwork or stone. Porches usually afford the most scope for essays of this kind, and dreadful enough things they are. However, they answer the purpose by way of a frontispiece good enough no doubt to impress the visitor; and besides, the rent, considering the size and number of the rooms, seems cheap. The houses readily find tenants, and what more do you want? The gables may assume in the same block every degree of pitch, and all kinds of proportions clash, while the windows dodge each other as they clatter together in the scramble after what is termed the "picturesque." All this, and more, goes without saying; but in spite of it all there is an improvement, and Mr. Norman Shaw's villas at Bedford Park, started a quarter of a century since, have made some difference, although even they were so soon tinkered by the speculator as to be quite despoiled of much of their original charm. Now and again an architect of artistic skill and good taste has been employed on similar projects with the net gain of an improvement on the whole all round.

The problem, though essentially the same for the greater part, yet remains undetermined, and an opportunity for the display of architectural ability is still afforded to all who take up the subject in a practical manner, with an intuitive sense of good proportion. In setting a pair of suburban villas for the last competition in the session of our Club for 1898-99, we did not expect that the result would be particularly startling, or that any great originality would distinguish the designs sent in. "McGilligan" is the best, then "Thistle," and "Dachs" ranks third. The conditions were these, and we reprint them for reference:—A pair of semi-detached suburban villas in brick and stone on 28ft. frontages, each suitable to let at £60 a year, and carry a £10 ground-rent. Depth of land 100ft. The two parlours to be commodious, the larger of the two to be used as the dining-room; five bedrooms, box-room, bath-room, and w.c. inside the house, besides servants' w.c., good kitchen, scullery with copper, larder, small store, and offices. The staircase is not to front the main entrance, and the hall must be 6ft. wide. Pitch of ground-floor 9ft., upstairs 8ft. 6in. Two or three rooms may be on second floor. The problem has often been solved, but still ever-varying chances of distinction are afforded. Plain, simple, and picturesque treatment desirable, adapted to the materials used and object of the buildings. Tiles for roofs set out to 45° slope. Plans, two elevations and section, also sketch. Frontage 15ft. from footway. Scale 8ft. to the 1in.; but, if necessary, plans may be smaller, say, $\frac{1}{16}$th scale. Economy and spaciousness to be considered. State price and cubing. View necessary.

It will thus be seen that our aim was directed on ordinary lines to obtain designs applicable to everyday needs on commonsense principles rather than an attempt at ideal requirements, which, after all, are so much subject to personal tastes and individual fancies.

"McGilligan" ranks first, with a good plan and plain sensible elevation. In neither respect is he very original, for a striking family likeness exists between Messrs. Brewill and Baily's houses in Lenton Boulevard, Nottingham, and this competition design (see Building News, Dec. 30, 1898). There may be some explanation for the similarity, though some will consider that the imitation is too evident, and others will think we ought to have disqualified the contributor from taking a place. In reply to such a contention we cannot say that to exclude "McGilligan" would relieve us of the difficulty which is thus prominently acknowledged, because none of the designs happen to be particularly original, or, for that matter, specially good either. If we begin by excluding designs for this reason, we shall not find it easy to know where to stop. It is better for a student to copy a good thing than to attempt without such a guide some poor production more entirely his own. It does require some degree of discrimination to select a worthy model. Anyhow, the design placed first is to be dealt with on its merits. One serious fault in this plan, as in most buildings of the kind, comes about from the fact that if a series of blocks are run up side by side and close together, as they most likely would be, the side windows immediately overlook those of the pair adjoining. There is no attempt at obviating so obvious an objection. The two houses are simply duplicated. The hall is not large enough to be shut off from the staircase. A screen in lieu of the divisional wall would be an improvement, and it would be made to sufficiently mask the staircase. The garden door is an advantage, and the drainage would be kept all on the off-side of the plot out of prominence and well together. The back door is a long way to reach, and out of view from tradespeople. A side gate to keep tramps away would be necessary. The tendency would be to needlessly use the front door. Every bedroom has a fireplace, and the kitchen department does not spoil what garden there is. The windows in the kitchen on the garden side would probably be high up, and are so shown in the section. "Thistle," the second man, puts his closets badly for simplicity of drainage, and the advantage of a garden door is lost by placing the pantry where it is, while space is wasted by the L-shaped passage round to the kitchen. This isolates the kitchen, it is true, but the dining-room is not a good shape. The bathroom off the half-space is not so good as if it were level with the first floor. The author has not left out the central chimney-stack in his perspective, as "McGilligan" has done, but the top-floor rooms would be very cramped. The side windows overlook, as in the first design; but the general effect is unambitious and befitting in style. "Dachs," the author of the third design, disregards the conditions usually governing the erection of semidetached suburban houses on confined plots, seeing that he places the dining-rooms facing right and left towards the party fences. There is practically no garden ground left, and inside the houses much space is lost, or rather wasted, on corridors. There are thus many reasons why "Dachs" should not have the third place in this contest. The merits of his plan are not strikingly obvious, and the dark end of his hall towards the middle of the block is ungainly and badly contrived. He has endeavoured, however, to give a touch of freshness to the exterior, and he has sought to depart from the regulation type of plan with some degree of thoughtful skill, and it is only by attempts of this kind that improvements are arrived at. We consequently have taken all things into consideration before encouraging "Dachs" to this extent, and while according him praise in so qualified a way, we do not overlook the claims of other contributors. We doubt if "Dachs" could get these houses built for £1,550, and it is not clear why so much masonry should be shown in the returns when so little is employed in front of the building. "Astragal" has followed the ordinary scheme of contriving the various departments, and he has imparted into it much ingenuity of planning in detail. There are a porch, a w.c. by the side a few steps up, a staircase screened from the front door, a tradesmen's side entrance, a store, and then a larder, all within the confines of the main building. The kitchen and scullery project at the rear in the usual way. £1,725 is the estimate, and stone bays are proposed, with an arched head in masonry to the entrance. The whole thing is fairly substantial, and each house has five bedrooms. The dining-room has a serving hatch, and the garden is not overlooked from the kitchen. The coals are in the basement. "Speys" is more simple, though in some ways very similar in plan, but the dining-room would be unhappy as a living-room, and very dark. The sanitary arrangements are on the inside walls of the extensions to the rear, and so complicate the drainage needlessly. Two basins for the bathroom lavatory are not necessary. The servants' w.c. is in full view of the garden. Externally the effect would be pleasing and suitable. The chimneys are not enough in evidence. "Honeysuckle" sends a well-drawn perspective, and his elevations are unassumingly effective, with a roughcast first floor and gables. The plan is ordinary with this exception, that the scullery has to be passed through to reach the kitchen, the windows of which, being placed at the angle, completely command the little garden. The same remarks as to the location of conveniences apply to "Honeysuckle" as to the last-named plan. "Butts" puts a central area, and locates his kitchen in a basement. We did not intend this; but there is no little ingenuity displayed in these plans. The area between the houses would be little better than a well, and we do not fancy the elevations would be very suitable, and certainly we have seen the kind of thing often enough before. "Tip" has a practical plan and relatively poor front; but in execution we have seen worse. "La Poupée" places the two parlours side by side in front of the house. The garden is shut off from the house, therefore, by the intervention of the offices. £1,327 is very inadequate as an estimate. "Ajax" gives each house a turret, and the perspective distorts the proportion of the elevation very badly. The first floor is wasteful in passage space, and a second staircase is not necessary in so small a house. "Oak" is careful; but the parlour on the first floor is a decided objection. The plan is compact and fairly well thought out, but the façade is commonplace. "Vigornia" has a pitch-dark staircase in the middle of the house. The depth of the plan is very great. "The Lucky Star" is very odd, covering the whole of his site. His elevations are extravagant and strange. "Levenach" comes next, and then "Desdichado," whose dining-room would be very dark indeed, otherwise the plan is clever. "Cantab" and "Clegornie" conclude the series.

A new form of caisson for executing work under water, the invention of the Russian engineer, L. Astarchoff, is about to be tried in the Neva by a committee of technical experts. The caisson in question has a conical form, and its inventor claims that, by its use, work can be carried on on the bed of a river at a lower atmospheric pressure than is now the case with the present caissons.

NATURAL VENTILATION.—V.

By Robert Boyle.

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The vitiated atmosphere usually found in imperfectly ventilated churches is the principal cause of the drowsiness with which many of the congregation are overcome before the service is over, and the fainting fits which so frequently occur in certain churches. This is due to a deficiency of oxygen in the air, and an excess of carbonic acid gas, watery vapour, and fœtid organic matter, combined—when the gas is lighted—with the poisonous products of combustion. A feeling of oppressive closeness and heat is also generally experienced under such conditions.

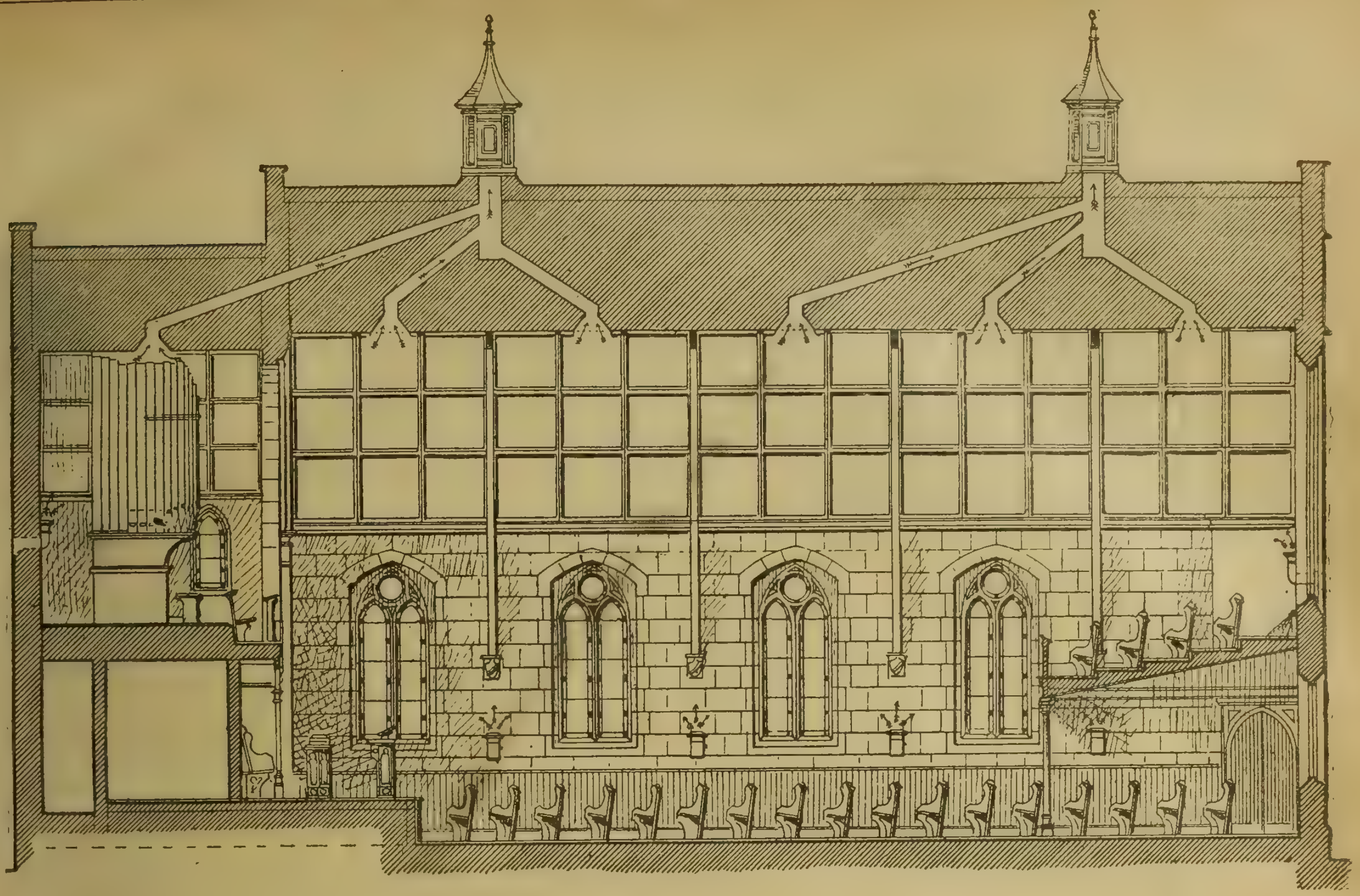
To the deleterious quality of the air found in so many churches is to be ascribed what is known as "clergyman's headache," and the feeling of lassitude and nervous irritation so commonly experienced during and after service. Badly-ventilated churches and halls are, more than any other cause, responsible for the dissemination of disease, and many people abstain from attending on that account alone, who would be only too glad to be present if the air was but in a healthy state.

All this might be avoided if proper means were employed to remove the vitiated air as fast as it was generated, and to provide a sufficient supply of fresh, pure air to take its place. This is now neither a difficult nor an expensive matter with the improved appliances which are in existence, and which utilise the natural forces ready to our hand to be our good servant if but properly managed. The immutable and beneficent laws of Nature, if but correctly understood and intelligently applied, will do all that is required—silently, continuously, and effectively. The vitiated air should be extracted at the highest part of the church, to where it naturally ascends, and the fresh air admitted at or below the breathing level in an upward direction, and at a low velocity through brackets or tubes distributed round the walls to secure more perfect diffusion and an equable distribution and movement of the air throughout the church. Where simple openings are made in the ceiling or the roof, and the air is admitted at the upper parts of the windows through glass hoppers, downward currents of cold air invariably result, which press down and return the acending expired air to be re-breathed, along with the products of combustion and other impurities. In cold weather downward currents of air may arise from the condensation of the warm air on the windows, walls, or open roof. This might to a great extent be overcome by thickly felting and double-boarding the roof, having the walls thoroughly warmed by means of radiant heat and the windows doubly glazed, or a radiator or hot-water or steam pipes placed underneath them to cause a counter upward current of heated air. Where extraction ventilators are employed, they are sometimes blamed for the down-draughts which arise from these causes. Hot-air should never be employed to heat a church, as it is injurious to health, owing to the high temperature required for effective heating, which deteriorates the oxygen required for the proper maintenance of health. Breathing warm air also enervates and lowers the tone of the system, rendering it more susceptible to disease.

An authority writing on the subject makes the following remarks with respect to the danger of hot-air heating:—"The teachings of scientists and sanitarians as to the healthiest mode of heating and ventilating buildings are now being recognised and conformed to by architects and engineers in a manner that augurs well for the future.

"The latest evidence submitted at the Royal Institute of British Architects, and at the International Congress of Hygiene, Budapest, has conclusively demonstrated that heated air employed for the double purpose of ventilation and warming is not only unhealthy, but fails as an efficient heating medium.

"Sir Douglas Galton, in a paper read at the Congress, strongly condemned this mode of heating and ventilating a building, stating that 'the method of warming the walls by means of heated air necessarily leaves the walls colder than the air of the room, and the heat of the body is radiated to the colder walls. Hence, if the walls are to be warmed by the air admitted to the room, the temperature of the warmed air must be raised beyond what is either comfortable or healthy for breathing, and thus, if you obtain your heat by



LONGITUDINAL SECTION OF A CHURCH FITTED WITH A NATURAL SYSTEM OF VENTILATION.

warmed air alone admitted direct to the room, discomfort in one form or the other can with difficulty be avoided.'

"Professor Corfield (Professor of Hygiene and Public Health, London University) said: 'Heating should be done by means of radiant heat, and not by means of air previously warmed. If air was previously warmed, it would lose a portion of its oxygen, and if we got air short of oxygen we had to breathe a greater number of times to supply the required amount, and that meant more effort.'

"M. Emil Trélat, who is recognised as the highest authority on the subject in France, declared that 'the solution of the problem of heating dwellings had absolutely no connection with that of their ventilation.'

"Mr. Thomas Blashill (architect to the London County Council), and others present at the Congress, expressed themselves in similar terms with regard to the unhealthiness of breathing warmed air, which was also employed for the purposes of heating."

Professor R. H. Smith, in an article on "Ventilation" which recently appeared in the *Engineer*, states that "a most instructive historical fact is the present gradual abandonment in the States and Canada of the hot-air system of house-warming, which was for so long popular, in favour of hot-water pipe and other 'radiator' warming. It is, in fact, impossible that the human body should absorb heat from the air in which it is immersed if that air be not made oppressively hot."

There has been some endeavour within the last few years to introduce downward ventilation in this country—forcing the air in at the top of a building, and expelling it at the bottom; but as this plan is opposed to the laws of Nature, it has not proved very successful where tried.

In the report of the Commissioners on Ventilation appointed by the United States Government, the following appears: "The relative merits of the upward versus the downward systems of ventilation may be estimated from the following considerations:—

"1. The direction of the currents of air from the human body is, under ordinary conditions, upwards, owing to the heat of the body. This current is an assistance to upward, and an obstacle to downward, ventilation.

"2. The heat from all gas flames used for lighting tends to assist upward ventilation, but elaborate arrangements must be made to prevent contamination of the air by the lights if the downward method be adopted.

"3. In large rooms an enormous quantity of air must be introduced in the downward method if the occupants are to breathe pure, fresh air, or about three times the amount which is found to give satisfactory results with the upward method.

"4. In halls arranged with galleries, the difficulty of so arranging downward currents that, on the one hand, the air rendered impure in the galleries shall not contaminate that which is descending to supply the main floor below, and, on the other hand, the supply for the floor shall not be drawn aside to the galleries, is so great that it is almost an impossibility to effect it.

"Perfect ventilation would not be obtained, for this would only provide for the *dilution* of the impure air, while in perfect ventilation the impurities are not so diluted, but completely removed as fast as formed, so that no man can inspire any air which has shortly before been in his own lungs or in those of his neighbour.

"For these and other reasons the Board are of opinion that the upward method should be preferred."

In a report on the ventilation of the Chamber of Deputies, Paris, M. Emil Trélat says:—

"The fresh air is delivered at the top of the room, and the currents of air are strong and varied, causing great discomfort.

"The air is delivered by fan propulsion at the ceiling, and is taken out at the floor, giving a downward system of ventilation.

"The apparatus is powerful enough to change the air in the chamber every six minutes; but it can only be worked slowly, owing to the draughts produced, and the air vitiated by respiration is brought back to be reinhaled."

The *Builder* very clearly points out the defect of this method of ventilation when it states that "it goes without saying that fresh air passing through a stratum in which gas-lights are burning cannot avoid bringing the carbon oxides, acetylene, and other products of combustion into the respiratory atmosphere. For English practice, therefore it may be regarded as incontrovertible that, save in a few exceptional instances, an upward current of fresh air is preferable."

The *Builder* further says: "There are also some statements and theories to which we take exception. One of these is the argument that because carbonic acid gas is 52 per cent. heavier than air, it is therefore desirable to ventilate by a downward current in a room rather than an upward one. The fallacy of this will be obvious to every one of our readers who smokes, if he will notice the course of the smoke after being exhaled. It is almost impossible in an ordinary room to make the smoke go down to the floor without a very violent effort. In all ordinary expulsion it would be noticed that the smoke ascends, and quickly becomes disseminated through the air in the room. The scientific fact is that air exhaled from the lungs is, at the moment of exhalation, equal in weight to pure air at a temperature of 90° Fahr. And until the exhaled air has parted with so much of its heat as to become heavier than pure air at this temperature, it will rise in a nominally pure atmosphere."

(*To be continued.*)

LIME AND MORTAR.

WHAT makes good mortar? Nine-tenths of your readers could not answer correctly, from a chemical point of view. They know well enough how to make good mortar, but of the actual conditions on which good mortar depends they know next to nothing. This is no cause for wonderment, as builders cannot be expected to be chemical. Builders, however, are frequently at a nonplus to understand the exact cause of a mortar turning out a poor one, or destitute of binding properties.

Now without going deeply into chemical questions, it is the purport of the writer to explain the causes of bad mortar, poor lime, &c., in such a way that all builders will, after reading the explanation, be able to know the cause, and find a remedy for any inherent defect they may find arise in the lime or mortar they use.

The requisite ingredients for producing good mortar are lime and sharp sand. The lime as it hardens contracts, and therefore by thus shrinking in bulk would cause mischief; hence the sand prevents the shrinkage to any perceptible extent, and not only prevents the shrinkage, but also affords a binding material with which the lime can combine, so that a homogeneous compound is produced. Again, good, fat lime when mixed with water, imbibes carbonic acid gas from the air, and thereby becomes converted, more or less, into a hard carbonate of lime. Consequently, instead of the mortar remaining a crumbling mass of powdery lime and particles of sand, it becomes a hard, compact mass, in which the particles of sand become surrounded with a hard film of carbonate of lime of a marble-like solidity; therefore, by reaching this condition the mortar does not shrink nor become reduced to powder. Anyone can prove this by attempting to crumble between his finger and thumb a piece of mortar of six months' age which has been made from fat lime and river sand. If the sand be not sharp, but smooth, then the grip of the film of carbonate of lime is not so strong. Whenever the lime has become converted externally into a film of carbonate it is practically waterproof, because water will not dissolve carbonate of calcium. Lime itself it will dissolve only very slightly (one part in 700 parts of water, at ordinary temperature). Now it stands to reason that mixing anything with mortar which will prevent or delay the formation of this film of carbonate will go far to tend to reduce the good qualities of the mortar, because, until the greater part of the lime has become carbonated, the mortar will remain a pulverulent mass. Garden mould, cinder ashes, road scrapings, or any other material known to jerry builders will prevent the formation of good mortar, and, as a result, any bricks laid in such mortar are held in place scarcely any firmer than if they were laid in a mass of flour-paste or any other non-hardening compound. This mud—it would be inaccurate to call it mortar—will not hold a nail securely; it will bear rubbing up to powder between finger and thumb, and so little adhesive power has it that any bricks laid in such mortar can be pushed out of place by the slightest blow, so to speak.

Now let us examine the nature and composition of the chief ingredient in mortar—viz., the lime. Lime is the name given to the oxide of the metal calcium. Such oxide, however, is never found in nature, but large quantities of carbonate of calcium, such as chalk, marble, and limestone are found, and it is from these bodies that the oxide of calcium (i.e., the lime) is obtained by artificial means. Chalk is a mass of calcic carbonate that owes its origin to the aggregation of a mass of shells of very minute organisms that lived in unknown ages ago. When first taken out of the quarries almost one-fourth of its weight is water. In actual composition a white chalk, such as is used for making a "fat" lime consists of the following constituents:—

Moisture	19·03
Sand and clay	0·93
Combined silicon dioxide	0·43
Sesquioxide of iron and aluminum ($Fe_2O^3 + Al_2O_3$)	0·48
Calcic carbonate ($CaCo_3$)	76 60
Magnesia carbonate	0·88
Alkalies, organic matter, and loss	1·65
	100·00

It is usual, however, to give the formula of chalk in $CaCO_3$—that means that it consists of 40 parts of calcium, 12 parts of carbon, and 48 parts of oxygen. These constituents are supposed to be present in two distinct bodies united together—viz., as calcium oxide (CaO) and carbonic dioxide (CO_2). Then $CaO + CO_2 = CaCO_3$.

Now, if the chalk be mixed with water, it will break down its mass and form a paste in the fluid, but it will not dissolve nor combine with the water. The pasty mass will still remain a mass of chalk, and, as every builder knows, chalk has no binding qualities like lime has. To convert the chalk into lime it is necessary to expel the carbonic dioxide (the CO_2), so as to leave the oxide of calcium or lime (the CaO) behind. The expulsion of the carbonic dioxide is effected by burning the chalk in kilns (limekilns), when the mass of chalk becomes converted into calcic oxide, or quicklime.

Now, lime that is just freshly burnt will readily imbibe carbonic dioxide gas from the air, and become thereby reconverted into calcic carbonate. This, however, is not wanted, therefore quicklime should be kept excluded from the air as much as possible. When quicklime is moistened with water, it combines therewith, and becomes converted into what is known as calcic hydrate, or hydrated oxide of lime ($CaOHO$)—that is, 40 parts of calcium, 16 × 2 = 32 parts of oxygen, 1 part of hydrogen. This calcic hydrate is called by builders "slaked" lime, and it is while the lime is in this condition that it is most ready to combine with carbonic dioxide, to become converted into carbonate of calcium, or carbonated lime. It is for this reason that the mortar-mixer first mixes the quicklime and sand together in the dry state, and then sprinkles the mixture with water so as to slake the lime, whereby the lime, as it unites with the carbonic dioxide from the air, will form a thin coating of carbonate around the particles of sand, and thus form a compact mass. Quicklime when moistened with water, or when slaked, swells up and increases in bulk one half its original quantity—viz., two measures of fat lime will make three measures of slaked lime. Now, if freshly-slaked lime be allowed to dry, it sets to a hard mass, which contracts, and therefore forms shrinkage cracks; but the admixture of sand prevents this. This first stage, or "setting," depends on the general property of very finely-divided amorphous substances—such as kaolin—of drying to a hard, caked mass. This change takes place each time; and then a further stage (hardening) occurs, due to the absorption of carbonic dioxide from the air, when the mortar becomes coated with the calcium carbonate, the insolubility of which makes the mortar permanent under ordinary weather conditions. In thick walls the air current rarely penetrates, and, as a consequence, the uncarbonated lime remains in the interior for many years. If the temperature of the air be low, the "setting" of the mortar is retarded. This is one reason for the abandonment of building operations during frost, the other reason being that the water in the mortar would become ice and expand, only, however, to become liquefied again on the return of a higher temperature; but by the solid ice becoming fluid water again, the mortar would become a pasty, non-setting mass of no adhesive qualities.

So far the above shows what good mortar should consist of; but the chief point to consider is the nature and composition of the limestone from which the lime is made. For example, if the lime contains a large proportion of magnesium carbonate, then it approaches the nature of dolomite, and, although useful as a building stone, it does not yield a good lime, but a poor one that allows building mortar to set very slowly. Lime obtained from such a source is better suited for making hydraulic mortar; it is, in fact, used only to make cement or hydraulic lime. If 5 per cent. of the magnesium carbonate be present, then the limestone is called dolomitic, and when 23 per cent. is present it may be ranked as dolomite. The burning of dolomite produces a material which is only fit for and used as a basic lining for furnaces. Besides carbonate of magnesium, limestone contains silicon and silicate of aluminum.

The following tables exhibit the relative proportions of the various constituents in (A) a typical pure limestone, (B) magnesium limestone, (C) hydraulic limestone, and (D) grey chalk—a kind of hydraulic lime:—

	A.	B.	C.
Calcium oxide (CaO)	55·54	27·22	44·84
Magnesium oxide (MgO)	0·22	16·85	1·15
Carbonic dioxide (CO_2)	43·68	37·62	33·70
Water (H_2O)	0·06	1·79	2 86
Sulphur trioxide (SO_3)	0·02	—	0·16
Insoluble siliceous matter	—	13·57	13·02
Combined silica	—	—	2·03
Sesquioxide of aluminum (Al_2O_3)	—	1·39	1·04
Sesquioxide of iron (Fe_2O_3)	—	1·56	1·C0
	99·52	100·00	99·80

	D.
Moisture	17·39
Sand and clay	4·85
Combined silica (SiO_2)	0·78
Sesquioxide of iron and aluminum (Fe_2O_3 & Al_2O_3)	0·53
Carbonate of lime ($CaCo_3$)	73·84
Carbonate of magnesium	0·66
Alkalies, organic matter, &c.	1·95
	100·00

Carbonate of lime, which is practically pure or free from siliceous matter, will yield a "fat" lime, but when siliceous and clayey matters are present then a "poor" lime results, which slakes slowly, and is more suited for making hydraulic mortar.

Another point of consideration in the ingredients used in making mortar is the method and manner in which the limestone has been burned. Some kilns are so constructed so as to burn by the aid of fuel mixed with the limestone. Other kilns are so constructed that the limestone is burned by producer gas. The relative merits of both methods are as follows:—

When carbonate of calcium (i.e., chalk, limestone, &c.) is heated to 752° Fahr., the carbonic dioxide (CO_2) begins to be expelled; but as the gas is very heavy it remains just above the limestone, unless carried away by a good upward draught of air by properly-constructed flues. If it be not quickly removed, the oxide of calcium that removed after the expulsion of the CO_2 will reabsorb the carbonic dioxide and become converted into calcium carbonate again; but the calcic carbonate so produced will differ in physical appearance from the original carbonate; it will, in fact, be more like marble. From these facts it will be noted that the temperature at which the limestone should be burned should exceed the above; in some kilns it reaches as high as 1494° F., which temperature yields the best results. As regards the methods of burning, the lime from the kiln in which producer gas has been used is the better of the two, because it is freer from ash, which is usually of a siliceous nature. Lime of commercial good quality should contain 83 to 90 per cent. of free CaO (calcic oxide), the remainder being calcium carbonate left unburned or reformed by exposure to air, calcium hydroxide ($CaOHO$) from absorption of moisture after burning, and calcium silicates and aluminates produced by the action of the lime on the siliceous constituents of the limestone and fuel ash. Magnesia is also commonly present, and when occuring in as high a proportion as 25 to 30 per cent., it renders the lime useless for ordinary purposes. The slowness of the hydration of magnesia causes such lime to slake feebly and imperfectly. In slaking lime, good "fat" lime slakes with so large and rapid evolution of heat that the temperature of the mass may rise as high as 302° F. "Poor," "overburned," or "dead-burned," lime is that which slakes slowly and with little evolution of heat, and yields a slaked lime less smooth and pasty than that formed by fat lime. The more silicon and clayey matter a limestone contains, the more liable it is to be overburned, and to yield a poor lime; the reaction between the lime and the siliceous matter (producing calcic silicates and aluminates, which become hydrated slowly and with little evolution of heat) takes place only at a comparatively high temperature; consequently the production of a "poor" lime from limestone containing these constituents may be avoided by cautious burning. The chemical composition of lime slaked in the air is approximately $CaCO_3 \cdot Ca(OH)_2$. This formula proves that the carbonate of calcium ($CaCO_3$) is united with calcium hydrate $CaO(H_2O)$ $Ca(OH)_2$. In other limes there is present—

80	parts of calcium (40 × 20 Ca)
12	,, ,, carbon (C)
80	,, ,, oxygen (16 × 5 O)
2	,, ,, hydrogen (1 × 2 H)
174	

If more water than the above be present, the slaked lime remains too fluid, while if less be present, it is too friable. If the slaking be done some time before the lime is to be used, most of its good chemical qualities, as regards being useful for mortar-making are lost, because the slaked lime will absorb CO_2 from the air, and thus become carbonated. The object sought after in making good mortar is to bring about the carbonation of the lime during the setting of the mortar so as to effectually inclose the particles of sand in the calcic carbonate as it is formed. H. C. S.

MANCHESTER GRATES, STOVES, AND VENTILATORS.

MESSRS. E. H. SHORLAND AND BROTHER, warming and ventilating engineers, of Drake-street Works, Manchester, the makers of the well-known and highly-appreciated Manchester grates, draw attention in their new illustrated catalogue to many new designs of their patent projecting Manchester grate, the firebox of which is lined with fire-tiles. The back portion being made to project over the fire greatly increases the radiating power, and also assists to consume the smoke. This back is applicable to any design of grate which has a canopy. The illustrations given of this grate show how effectively the fuel and smoke are consumed. A cold-air inlet below the floor-level at the back admits to a warm-air chamber at the back of the projecting fire-tiles, and warm-air pipes 4½in. diam. of socketed drain-pipes are carried up the chimney-breast, with an inlet below ceiling. The advantages of this system of warming and ventilation have been described by Professor Carnelly, D.Sc., several inspectors of schools, and a list of places is given where the patent grates, stoves, &c., are in use. Several excellent designs are shown, as Nos. 101, 104

984, 985, 106, 110, with the improved projecting back and canopy, and with special faïence chimneypieces round them. The registered designs on pages 14 and 15 are elegant adaptations of the principle, and the chimneypiece is plain and effective of glazed faïence with tiled hearth and faïence curb fender. These are very neat, and worth the architect's attention, and the prices quoted are very moderate. Nos. 107, 108, and 393 designs are very effective; the canopies in some cases are of polished *repoussé* copper or brass. Various illustrations of Shorland and Brothers' patent, showing the arrangements of warm-air pipes, are given on subsequent pages. Many exceedingly good examples of Shorland's Manchester stoves, double and single fronted, with either ascending or descending smoke flues, and Shorland's "Combination" open fireplace Manchester stove are illustrated. These are now made in ornamental glazed faïence, as well as in iron. We also notice a number of new designs of this firm's patent exhaust roof ventilators, inlet tubes and panels, all made by special machinery; they are exceedingly strong and well finished. Many thousands of the open fireplace stoves are in use in hospital wards throughout the country, and they are considered as the best stove for hospital use. The sections of this useful catalogue are printed on three different toned papers, which greatly assists reference. We recommend our readers to get a catalogue, as many new designs of grates appear.

THE SANITARY INSTITUTE AT SOUTHAMPTON.

THE eighteenth annual congress of the Sanitary Institute is being held at Southampton this week, and some 1,700 to 1,800 delegates have been present at the meetings. The proceedings were opened on Tuesday by a reception by the Mayor in the Hartley Institute in the morning, followed by a luncheon in the Royal Pier Pavilion. The Mayor proposed "The Sanitary Institute," to which Mr. H. Law, chairman of council, responded. He said that the Institute had held 1,700 examinations. There had been 7,000 candidates, and 2,300 had passed. In the afternoon Sir W. H. Preece, the president for the year, delivered his inaugural address at the Hartley Institute. He observed that Moses was the greatest sanitary engineer the world had ever known, and that the Book of Leviticus was a treatise on hygiene. Its doctrines were the objects of sanitation to-day—pure air, pure water, pure food, pure soil, pure buildings, pure bodies. Sir W. H. Preece set forth the principles and practice of modern science for the attainment of these ideals, and pointed out that electricity was performing a useful part in improving the sanitary conditions of houses, in facilitating the circulation of pure air without draught while withdrawing foul air. For a supply of pure water the authorities must rely on regular and active inspection. The Thames Valley, even with the present works, would be equal to the supply of London for fifty years to come, and the fact of the death-rate in the Metropolis being below the average was evidence of the purity of the water.

In the evening a health exhibition in connection with the congress was opened by the Mayor of Southampton, and will remain open until Saturday, the 23rd inst.

Wednesday was devoted to conferences, of which seven sat in the various lecture and class-rooms of the college; while at the council chamber and municipal offices a conference of ladies discussed questions of domestic hygiene, occupations suitable for women, &c., the Mayoress of Southampton, Viscountess Harberton, Mrs. Constance Patey (president), Lady Kathleen Eliot, and the Hon. Mrs. Eliot Yorke, and other ladies taking part in the proceedings. A conference, meeting for the first time at these congresses, that of medical officers for schools, dealt with the hygiene of school life and school buildings, and sat again yesterday (Thursday).

One of the most interesting of the eight sections which met on Wednesday was that of Health, which met in the Municipal Buildings, under the presidency of Mr. Alderman Thomas Walton (Chairman of the Health Committee of Southampton), who in his address dealt in detail with the methods adopted in that town to bring about an efficient system of sanitation. The housing of the working classes from an architect's point of view was discussed by Mr. Charles J. Hair, of Southampton, who, in a paper well illustrated by diagrams, said the system of lodging-houses which had been established was the nearest approach to rehousing the poor which had been made. That was chiefly due to the fact that everything was concentrated, and that there was a general kitchen, living-room, and scullery common to all the inmates. The provision of artisans' dwellings was, perhaps, the most popular form of rehousing the working man, as it provided separate dwellings for each family. There were two kinds of artisans' dwellings—the self-contained and the associated—and he believed the former to be the most successful plan. A paper was also read by Mr. Thomas Blashill, late superintending architect to the London County Council, and a discussion followed, in which various forms of houses for the working classes were suggested.

Mr. E. P. Hooley (Nottingham) presided over the conference of engineers and surveyors, and spoke of the difficulties of public life, especially in regard to the position of a surveyor under one or other of the present councils.

In the conference of sanitary inspectors, Mr. H. H. Spears, chief sanitary inspector, West Bromwich, stated that the conditions under which sanitary officers worked were unfair and harassing, and salaries were being paid which would be derided by the average day labourer. He deprecated the insecurity of tenure and the lack of independent power of action of sanitary inspectors, and urged that the administration of the Public Health Acts should be taken out of the hands of the local authorities altogether, and vested in the State. He did not, however, desire to see the duties vested with the Local Government Board as at present constituted, but there should be a Minister of Public Health. Mr. S. Fairchild said it would be of considerable advantage if by-laws were more uniform and definite throughout the country. By-laws should be adopted dealing with the general state of repair and cleansing of dwelling-houses, and it should be an offence to construct, amend, or alter any drain or fitting in connection with water supply or sanitary appliances without giving notice to the local sanitary authority. Mr. H. Alexander, chief sanitary inspector, Shoreditch, read a paper in which he pointed out the importance of safeguarding cisterns from impurity.

An attractive feature of the ladies' conference was the address by Viscountess Harberton, who read a paper on the hygiene of dress, in which it was contended that it was a delusion to think that women's dress could not be made on a different principle from that at present adopted, and still look beautiful. Women should adopt a method of dressing which would be a physical help, instead of being the impedimental and disease-producing monstrosity of the 19th century.

The meetings yesterday and to be resumed to-day (Friday) are being held in three sections: (1) Sanitary Science and Preventive Medicine, with Sir Joseph Ewart, M.D., as president; (2) Engineering and Architecture, Mr. James Lemon, F.R.I.B.A. (ex-Mayor of Southampton), engineer and architect, presiding; and (3) Physics, Chemistry, and Biology, over which Professor Percy Frankland is presiding. The entertainments provided by the Reception and Hospitalities Committee include excursions to Lyndhurst and the Rufus Stone in the New Forest; a water trip round the Isle of Wight, given by the directors of the London and South-Western Railway; a trip to Bournemouth, and other excursions.

THE ORDNANCE SURVEY.

A REPORT of the progress of the Ordnance Survey to March 31 last has just been issued. It is stated that the actual work of revising the original 1-2,500 maps of England and Wales was not begun till 1894. Since that year the following counties have been resurveyed:—Bucks, Cheshire, Durham, Essex, Flint, Hants, Herts, Kent, Middlesex, Northumberland, Surrey, Sussex, and Westmoreland. The revision of the following counties is in progress:—Anglesey, Berks, Carnarvon, Cumberland, Denbigh, Derby, Glamorgan, Monmouth, Northampton, Notts, Oxford, Stafford, and Wilts. During the same period 1-2,500 maps have been prepared of London, Plymouth, and the Tyneside district, and also of all towns in the districts under revision. The total area of which maps have been published is 13,988 square miles, of which 4,752 square miles were published in the year 1898-99.

The 6in. to the mile maps of the revised counties of England and Wales, are, as a rule, being reduced from the revised maps on the 1-2,500 scale, and are published by heliozincography. In uncultivated districts the revision is made direct on the original 6in. maps. The total area published is 10,010 square miles, of which 6,222 square miles have been published during the year ended March 31 last.

In accordance with a recommendation of the departmental committee which sat under the chairmanship of Sir John Dorington, M.P., and reported on the survey of 1892, the Treasury in 1893 sanctioned the principle that the 1in. map should be revised every 15 years independently of the revision of the maps of Great Britain on the larger scales. This sanction at first applied only to the maps of a part of England and Wales, but it was subsequently extended to the whole country, as there were very few sheets of which at least part was not surveyed more than 15 years ago. The field work of the revision was begun in 1893. Since that year the whole of England and Wales has been revised on the ground. The revised maps of 54,594 square miles have been engraved and published, of which 26,289 square miles have been published during the year. This revision will be completed this year. Before the revision of the 1in. map began, the details which should appear on it were carefully considered, and various changes have been introduced during the revision with the view of adding to the value of the maps for military purposes and for the use of travellers, without diminishing their value for civil purposes. The principal features of the new as compared with the unrevised maps is that the former distinguish metalled from unmetalled roads, and double-line from single-line railways. It was a marked defect of all the 1in. maps of the United Kingdom which were published before the last few years that, although they showed unmetalled tracks of all kinds, as well as roads fit for wheeled traffic, they showed no distinction between them. The general result to be obtained by the revision is that in 1899 there will for the first time be available to the public a 1in. outline map of the whole of the country, prepared on one uniform system, and with its principal details nearly up to date. There has been a considerable demand by the public for the sheets already issued.

The revision of the 1-2,500 maps of Scotland began in 1894, and the following counties have been completed:—Argyll, Ayr, Bute, Berwick, Dumbarton, Dumfries, Lanark, Linlithgow, Peebles, Renfew, Roxburgh, Selkirk, and Stirling. The survey of the counties of Aberdeen, Clackmannan, and Perth is in progress of revision. Revised maps of Glasgow on the 1-2,500 scale have also been prepared. The publication of the revised 6in. maps of Scotland is somewhat in arrear. The revision of the 1in. outline map has been completed.

The resurvey of Ireland on the 1-2,500 scale has been delayed, owing to the extreme closeness of the detail in parts of some countries. There are many plans on which the inclosures are of less average area than one acre. The counties of Clare, Kerry, Mayo, and the southern half of Roscommon have been completed. The work is proceeding in Cork, Galway, Kilkenny, and Limerick. Revision of the Irish 1in. scale map on the same system as in Great Britain has been begun.

The sum allotted to the Ordnance Survey for 1898 99 was estimated at £233,955, and the expenditure has been £233,182.

EXCAVATIONS AT HAILES ABBEY.

THE ruins of the Cistercian Abbey of Hailes, about a mile and a half from Winchcombe, are being excavated under the direction of the Rev. W. Bazeley (hon. secretary of the Bristol and Gloucestershire Archæological Society) and Mr. St. Clair Baddeley. The site of the abbey originally covered some five or six acres, and since the excavators began their work several interesting discoveries have been made. The abbey was founded in 1246 by Richard, Earl of Cornwall, the brother of King Henry III. The building cost the earl some 10,000 marks, and was consecrated on November 5, 1251, in the presence of Henry III. and his Queen, when it is recorded that thirteen bishops said Mass simultaneously at thirteen altars, and this has led the excavators to believe there were nine altars in a row from north to south at the end of the presbytery, it being known that there were also four altars on the east side of the transepts. Exactly 20 years later fire consumed a large portion of the monastic buildings, and the Earl of Cornwall, then King of the Romans, gave the monks 8,000 marks towards the restoration. The same year (1271) the Earl's son Henry was murdered while at prayer in the church of San Sylvestro, at Viterbo, by Guy and Simon de Montfort, sons of the great Earl of Leicester, as an act of vengeance. The heart of the prince was, as Dante mentions, placed in a golden vase and sent to the shrine of Edward the Confessor at Westminster, his flesh was buried between the remains of two Popes in the Cathedral at Viterbo, and the bones despatched to Hailes Abbey, where they were buried in front of the church altar. Earl Richard died six months later, and was buried at Hailes Abbey, which also afterwards became the sepulchre of his Queen, Sanchia (a sister of the Queen of Henry III.), and a number of other leading scions of the nobility.

At the dissolution of the monasteries in 1539, the abbey and all its possessions were surrendered to the commissioners of Henry VIII., who condemned as useless all the buildings except the abbot's house and a few adjoining kitchens, &c., which were occupied by the Lords Tracy until about 1686, since when they have rapidly fallen to ruin, until only the three arches on the inside of the cloister walk remain.

Bearing in mind the plans of other Cistercian abbeys, such as Tintern and Beaulieu, the excavators at Hailes have been able, says a correspondent of the *Times*, to make out all the parts of the old monastery, and their object now is to clear the walls which remain of the cloisters and to strengthen the arches which are now in danger of falling, after which each part of the abbey will be explored. On the north side of the cloisters have been found the remains of five carrels similar to those on the south walk of the cloisters of Gloucester Cathedral, where the monks copied MSS. and did illuminations, and three of the five are in a fairly good state. One the north-east corner of the cloisters is a beautiful Early English processional door leading into the south aisle of the church, and in an angle of the cloister adjoining is a corbel carved in the form of an angle, from which springs the 15th-century vaulting of the cloisters. The west wall of the south transept is gone; but at the south end is an archway with two trefoils and a quatrefoil leading into the sacristy. Next to this is the chapter-house, the vaulting of which (dating from 1271-77) has fallen down bodily, and lies beneath the soil. The excavators have already unearthed a large portion of it, and amongst the remains brought to light are a couple of Early English bosses, richly carved, which, according to Mr. Bazeley, rank among the finest productions of 13th-century work. Next in order come the monks' parlour, the undercroft of the great dormitory (the remains of the staircase to which have been discovered), the calefactory or warming parlour, and a lavatory in a large recess. There are indications that the door leading to the refectory was a remarkably fine example of Early English work; but its perfect marble shaft, bases, and capitals were ruthlessly cut away by the 15th-century builders. It is thonght that the timber roof of the refectory is at Bisley, near Stroud. Local tradition lends colour to the view that the roof was removed bodily, and the measurements already taken agree with those of Bisley.

One of the most valuable discoveries up to the present time was made while the west walk of the cloisters was being being excavated. The whole of the stone vaulting was unearthed and in addition were found six stone bosses, each in an unusual state of preservation and bearing the coats-of-arms of Sir John Huddleston, Lord of Southam (a village four miles away), of Henry, Lord Percy, and of Sir William Compton, who flourished in the early years of the 16th century, which leads to the supposition that the cloister walk was built in the time of Abbot Stafford. Another finely-carved boss bears the arms of the abbot, while the identity of some others has not yet been fully established. Near the site of the Early English processional door, where the monks entered the church, a corner-stone was unearthed, and the bases of seven single columns, 17ft. apart, were also laid bare. In the south transept were uncovered a number of tiles, some of which displayed the coats-of-arms of FitzWarren, of De Clare, and of Eleanor of Castile (mother of Edward III.). Another discovery is the head of a double trefoil-headed door leading into the chapter-house. The coat-of-arms of the Abbot, in which three mitres and a double shackle are prominent, indicates that he had a seat in the House of Lords. It is believed that the monastery must have been very rich, not only on account of its Royal foundation, but also from the large number of pilgrims who annually flocked thither to see the "Blood of Hailes." Pilgrims from the North Country flocked along the Foss-way to see the precious phial which was supposed to contain a portion of the Holy Blood. It is said that the blood was procured by the Earl of Cornwall about 1271, and that he gave a portion of it to Hailes Abbey and the remainder to the Augustinian Canons of Ashridge, in Hertfordshire. The portion given to Hailes was famed throughout the country, and in Bishop Latimer's letters are to be found references to it.

The work undertaken by the society has been delayed owing to the want of funds, and the council of the society are, therefore, making an appeal for another £200 with which to excavate the site of the cloisters, the church, the infirmary, and detached buildings. The treasurer is Mr. G. M. Currie, 26, Lansdown-place, Cheltenham.

MINIMISING RISKS OF FIRE IN LARGE STORES.

The following sensible recommendations form the conclusions of a paper by Mr. E. U. Crosby, recently read before the U.S. National Fire Protective Association, under the title of "Department Store Fire Hazards." 1. There should be no light-well. (*a*) The loss of illumination due to the abandonment of the light-well can be more than made up by a proper use of the wonderful Luxfer prism glass in wall windows, helped out in specially deep or angular buildings by the modern artificial white light. (*b*) Where such a well is allowed to exist, it should be shut off from communication with each story by "wire" or "prism" glass partitions, set in non-combustible frames, permanently secured in position. First story to be shut off from well by similar horizontal partition at ceiling level. For deep wells a certain arrangement of Luxfer prism glass is suggested. (*c*) So long as light-wells are allowed to remain in violation of *a* and *b* above, they should not be used for display of goods or of any inflammable decorations. No temporary structures should be allowed therein. Where an exception is made for the display of goods on first-floor counters, automatic sprinklers should be placed directly over said goods on level with ceiling of first story. These can be fitted to brass pipes in a manner quite decorative, and are in addition to the sprinklers otherwise called for in well by the sprinkler regulations.

2. Stairs and elevators should be in brick shafts, with spacious entry-way on each floor within each shaft. A standard slide fire-door should be hung at shaft side of each opening into entry-way, permanently secured open by a 600° Fahr. solder releasing device. This is to insure that door shall not be closed by hand in time of panic, and yet will close automatically at a high temperature. There would be two or more door openings from each floor into each shaft. They would extend but part way to ceiling, thus reducing the tendency of smoke to escape in that direction. The normal draught would be towards the ventilating ducts, and would suffice to reduce the danger of hot-air and smoke explosions. The placing of doors at shafts is open to criticism, inasmuch as they might be closed while people were yet alive within the burning room. We believe this can be met by concealed sliding doors operated by an automatic device located near the floor and requiring as high a temperature at that point as would be obtained by the presence of flames. These shafts, with glazed brick, tile, or mosaic walls, should present a pleasing appearance, and, above all, afford a sense of security to the customer which some day may be a feature in the popularity of a store.

3. Ventilation should be obtained by forced draught through specially constructed brick ducts, with openings from same to rooms arranged to prevent passage of smoke back into rooms. We are informed that light-weight (mica) check-valves have for years accomplished this purpose, as used in chimneys of English houses. Some such system is essential, in order to obtain correct ventilation, if for no other reason.

4. With the other requirements observed, it may not be necessary to consider the question of area. Yet "division" or even "curtain" walls are recommended. In any event, it is more essential to "stop" vertical openings with their attendant fire-spreading draughts than to restrict ground area.

5. Walls, floors, roofs, and partitions to be of the best "fireproof" type which (vertical openings not being allowed) shall be capable of confining a fire within the story where it may originate.

6. Last, and of the greatest importance: A complete standard automatic-sprinkler system should be installed, having supplies capable of delivering water for long periods at high pressure. This system should be kept under rigid inspection. On it a constant burden rests, for the sprinkler must ever be on duty to perform its work by day or night. In it the greatest power lies, as, when the smoke is thick and men stand back, when the hose-jet would pierce the window only to be scattered by the first obstruction, the sprinklers far within the building are quietly surrounding the fire and are holding it firmly in check. By it alone does the department-store of to-day exist, for, had the fires controlled by automatic sprinklers during the past seven years been combated only by other existing appliances, we believe the loss of values and, perhaps, of life, would have been so materially increased as to have provoked many stringent regulations not now in force.

CHIPS.

The Congregational Chapel at Sawston was re-opened last week after renovation, carried out by Messrs. Webster and Co., of Cambridge.

A new organ recently erected in Bathgate parish church, Edinburgh, by Messrs. Bishop and Sons, London and Ipswich, was inaugurated on Friday.

The first ordinary meeting of the session 1899-1900 of the Royal Institute of British Architects will be held on Monday evening, November 20, when a paper on "The Buildings of the Paris Exhibition of 1900" will be read by M. Charles Lucas, of Paris, hon. corresponding member. The presidential address will be delivered by Mr. W. Emerson a fortnight previously, Nov. 6th.

An action was brought in the Holt County Court last week by Mrs. Mary Elizabeth Newman, as executrix of her husband, a Cromer builder, to recover £68, the balance of an account for building some houses, from Mr. Gilbert Mayes Bultitude, shoemaker and saddler, of Cromer. It was contended by defendant that the amount had been paid. After a lengthy hearing judgment was given for plaintiff for the full amount.

Lady Johnson laid at Upton-on-Severn on Friday the foundation-stone of a new chapel for use in connection with the workhouse. The cost—about £450—has been met by public subscriptions.

On Wednesday week, at Blackpool, Colonel W. R. Slacke, R.E., a Local Government Board inspector, held an inquiry into the application of the corporation for sanction to borrow £9,156 for works of private street improvement. There was no opposition. The money is to be devoted to making new streets, which are already sewered and built upon.

Lord Kitchener reached the Atbara on Saturday morning, and formally opened the Atbara bridge. The ironwork has been supplied by an American firm, and the piers have been built by Messrs. Thomas and Co. Lord Kitchener remarked that it was not until 1896 that railway communication was commenced in the Soudan, yet to-day they had 589 miles of line actually working north of the bridge, and 122 miles completed to the south, thus leaving 75 miles before they reached their goal, which was Khartoum.

In consequence of the overcrowded state of the county asylum at Brookwood, the Surrey County Asylum Board have sanctioned additions to Brookwood Asylum to provide accommodation for the normal increase in lunacy for the next few years, and they have also purchased the Netherne estate for the purpose of erecting a second asylum.

A few months ago the Corporation of Glasgow acquired from Mr. William Simpson, R.I., whose death was recorded by us last week, a series of water-colour drawings, illustrative of the aspect of Glasgow in the "forties." The drawings have now been mounted, and the complete series is exhibited in the People's Palace. The drawings, which number 55, form an accurate record of many building sites and scenes which since have been either swept away or changed beyond possibility of recognition. Advantage has been taken of the opportunity of showing these drawings to bring together the whole collection of views and drawings of Old Glasgow in the possession of the corporation.

OBITUARY.

Mr. Andrew William McKay, who died at Aldeburgh on Sunday last at the age of 78, was for many years the head of the firm of P. and D. Colnaghi and Co., of Pall Mall East. He had an excellent knowledge of old prints, and had been instrumental in forming several of the chief collections made by English amateurs of the last generation, as well as in compiling such catalogues as those of the Buccleuch and Holford sales. He was also the compiler of the catalogues of miniatures and pictures in the possession of the Duke of Buccleuch, and helped Dr. Hamilton in preparing his classical "Catalogue of the Engraved Works of Sir Joshua Reynolds." Mr. McKay retired from business some years ago, when the firm was reconstructed.

We regret to record the death from blood-poisoning on Monday week, at his residence at Redhill, of Mr. John E. Harley, architect and surveyor, of 12, Paternoster-row. He leaves a wife, one son, and four daughters. Mrs. Harley, who is the daughter of Mr. J. B. Horner, is best known as Fanny Eden, the authoress of many of "Horner's Penny Stories." The funeral took place on Thursday in last week, at Reigate.

CHIPS.

At the last meeting of the urban district council of Pembroke, near Dublin, the surveyor, Mr. Farrell, was instructed to prepare plans and estimates for a scheme of about 100 dwellings of different classes to be built on a site at Ringsend, given to the council by the Earl of Pembroke and Montgomery.

On Tuesday week Colonel W. Langton Coke, M.Inst.C.E., one of the inspectors of the Local Government Board, held an inquiry at the Town-hall, Northampton, in respect to the application of the town council for permission to borrow £13,392 for sewerage and sewage disposal in connection with the borough. Mr. W. D. Gibbins, borough engineer, explained the plans.

New British Schools in Stanley-road, Pokesdown, Bournemouth, were opened last week. They accommodate 362 children, and have cost £2,600.

Coke concrete has recently been investigated in the United States to determine its usefulness for places where light weight is desirable, such as foundations for pavements on bridges. The work was done by Mr. W. H. Vance, and it appears that coke makes concrete 40 per cent. lighter and 45 per cent. weaker than similar material in which broken stone is used. The best results were obtained with dry coke, an anomaly for which no explanation is given.

For some time past the Great Eastern Railway Company has been doubling its line between Lynn and Wolferton and erecting a new station at Lynn. The works are now completed. There are up and down platforms, to each of which are attached Royal waiting-rooms, with cariage-drives distinct from the public portions of the premises. The Midland and Great Northern Joint Committee is spending a large sum of money in improving its stations and doubling certain portions of its line in Norfolk. New stations are to be opened at Weybourne, Sidestrand, and Overstrand, on the Norfolk coast, on the line of the authorised Mundesley and Cromer direct railway.

Over £8,000 has been spent at Chatham during the last few years upon the chancel, side chapels, tower, and bells of the parish church, and it is now desired to rebuild the nave, which is "leaky, dilapidated, and most unsightly." Sir Arthur Blomfield, A.R.A., the architect for the works already completed, has been consulted, and his estimate of the cost of the proposed restoration amounts to about £6,000.

The Grimsby Corporation have accepted a tender to erect a fever hospital at a cost of £1,036 on a field of eight acres belonging to Sir Walter Gilbey, in Little Coates parish. The total amount authorised for expenditure, including the contract, was £1,500.

The Lord Chancellor will open the new Central Public Library erected by the Hornsey District Council in Tottenham-lane, Hornsey, on Oct. 26.

An architect in one of the large Canadian cities advertises his work in this peculiar way: "It is a delicate compliment to the cook when you call for a second plate of the same dish. This kind of compliment has been paid this office by clients, not the second time, but time and time again."

At the meeting of the Stamford Board of Guardians on Monday, the contract of Messrs. Walker and Slater, of Derby, of £23,150, for the erection of the new workhouse was accepted. The architect's estimate was £15,000, and he explained that the difference in the figures was due to the rise in the price of materials.

Building Intelligence.

Arklow.—The new church of St. Saviour, Arklow, built at a cost of nearly £30,000, borne by the Earl of Carysfort, was consecrated by the Archbishop of Dublin on August 12. Sir Arthur W. Blomfield, A.R.A., was the architect of the church, which consists of nave, aisles, transepts, chancel, chancel aisle, vestry, and organ-chamber, and is built of granite in the Early English style. The tower is 150ft. in height. A carved representation of the Last Supper is over the Communion-table, and above it a stained-glass window. The open roofs and ceilings are of oak, that of the nave being vaulted with carved bosses at the intersection of the groined ribs. The chancel ceiling is formed with a series of carved, moulded panels, supported on moulded and carved brackets, and enriched with carved bosses. The fittings, including the seats, clergy and choir stalls, pulpit, organ-case, Communion-table, and rails, are made in walnut; the screen and internal lobbies are of oak. The reredos is of Corsham stone, with Connemara marble shafts and mosaic panels. The sculptured panel of the "Last Supper" is the work of Mr. Thomas Nicholls.

Edinburgh. — The buildings and plant at Lochrin, Edinburgh, which have been erected by the Edinburgh Ice and Cold Storage Company, Limited, for the manufacture of ice and for cooling and freezing purposes, are rapidly approaching completion. The ice is to be made entirely from water from the Edinburgh mains, and in order to insure its purity it is passed through a distilling process. The plant is guaranteed to produce over 3,000 tons of ice per annum, and storage is provided for over 250 tons of the material. The main building consists of three flats of cold chambers, those on the platform level being intended for carcases of bullocks, sheep, &c., and are fitted with rails with running pulleys. The two upper flats are intended for the storage of all kinds of perishable commodities, and are kept cool by a constant draught of cold air. The machinery for freezing and cooling is on the Linde ammonia compression system. The boiler is of the new Hornsby type, the first of the kind in the district. Electric motors are used for driving the auxiliary machinery. The premises, which are lit by electricity throughout, are adjacent to the Edinburgh slaughterhouse, and from the slaughterhouse carcases can be run into the cold chambers on rails. Messrs. Cooper and Taylor, George-street, were the architects.

Glasgow.—At a special meeting of Glasgow Parish Council held on Friday, a report by the Finance Committee on office accommodation, recommending the erection of new offices in John-street, was agreed to. A report was then submitted by a special committee on poorhouse and hospital accommodation, which made the following recommendations:—(1) That a general hospital or infirmary be erected to accommodate 1,200 patients, including a sanatorium for cases of consumption, wards for epileptics, and for homeless poor persons discharged from the asylums; the grounds thereof to be of such extent as to afford room for the erection of cottages or other buildings for aged married couples; and (2) that two district hospitals, to accommodate 200 patients each, be erected, for the treatment of acute cases in the east and west ends of the city respectively. That one of such hospitals be increased in accommodation over the others by fifty beds for the care and observation of cases of mental disorder. The report also advised the sale of the city poorhouse and ground attached thereto in Parliamentary-road. The valuation of the building and land of this poorhouse was £99,100 sterling, after deducting yearly feu-duty, amounting to over £400. After discussion lasting over an hour and a half, the report was adopted by 21 votes to 4, and the committee appointed was authorised to take steps towards arranging for the purchase of the necessary land, and to procure information to lay before the council.

Lincoln's Inn.—The old gate-tower in Chancery-lane, which forms the principal entrance to Lincoln's Inn, is now undergoing renovation and repair. The work, which is being carried out under the direction of Mr. Dennett H. Barry, the surveyor to the Honourable Society of Lincoln's Inn, will include the taking down of about 4ft. of the stone coping and parapet walls of the two towers facing Chancery-lane, the repointing of the brickwork, and the repair of the original old oak gate, which is closed to the public every night. Great care, however, will be taken that no structural alteration or change will be made in the appearance of the old tower, which is stated to be structurally strong and likely to last for many years to come. This old tower was built in the reign of Henry VII., and it is stated that in the rooms over the gateway Oliver Cromwell once occupied chambers. The wall of Lincoln's Inn was commenced in the reign of Queen Elizabeth, and it is said that Ben Jonson the dramatist worked thereon as a mason. Prior to the erection of this wall, the site of which is now occupied by chambers, Lincoln's Inn was separated from Chancery-lane by an embankment of clay only.

Louth.—The new Technical School at Louth was opened on Thursday in last week. The building is in the Queen Anne style. On the ground-floor are two lecture-rooms, measuring 27ft. by 17ft.; also a room for manual instruction, the dimensions being 27ft. by 19ft. There are also the head master's room and various offices. Upstairs is the art-room, measuring 41ft. by 27ft. There are also a chemical laboratory, 26ft. by 13ft.; a lecture-room for chemistry and electricity, 27ft. by 19ft. The building is heated throughout with hot water, low-pressure system, and there are radiators in the several rooms. The contractors are Messrs. Mawer Bros. The school is lighted throughout by incandescent burners. The total cost is about £1,452.

Norwich.—It is probably, says the *Norfolk News*, a long time since Norwich was the scene of so many extensive building enterprises as are now in progress. The cottage builder is singularly active just now, especially in the neighbourhood of Catton, Sprowston, and Eaton, and there are several big building schemes afoot of a more or less public character. One of these is the erection of the new Technical School. Another municipal enterprise is the fire station in Pottergate-street. Next in order of importance come the new Jenny Lind Infirmary on Unthanks-road, the tramway company's generating station in Duke-street, and the extensions which the Electricity Company is making to its works on the opposite side of Duke-street. Among private enterprises should be mentioned the rebuilding of the burnt-out side of Dove-street, where Messrs. Chamberlin, Sons, and Co., have the builders busily at work, and the erection of a line of shop frontages in Red Lion-street, opposite the spot at which the old Goose and Gridiron block was lately demolished. Then there are the extension of the isolation hospital, tenders of which will be let soon, and the erection of the new theatre in St. Giles's. The Technical School in Bridge-street is making excellent progress, the intention of the contractors being to get the roof on before winter. The work already finished comprises the basement and the ground and first floors. The joists for the second floor, where the art rooms are situated, have just been put on. The cornice of the second floor is in its place, but it is at present obscured from view by the scaffolding, which will presently be carried higher, in order that the men may get to work on the Costessey dressings with which the upper part of the building will be adorned. The ornamental portions of the upper exterior have yet to be taken in hand. The roof is being prepared mainly in Manchester. The extensions which the Electricity Company is making in Duke-street have been undertaken with a view to the requirements of the future. The engine-room is being extended, and an additional boiler-house is being built providing accommodation for twelve boilers and seven large engines. For these purposes the premises lately vacated by Messrs. Riches and Watts have been utilised, and a red-brick frontage to Duke-street is being built in a style uniform with that of the already existing offices. At present it is intended to cover in only about half of the new boiler-house and engine-house, leaving the remainder to be completed as occasion arises. The present works include the building of a new shaft, which will run to a height of 150ft, and a new suite of business offices.

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Work upon the monument of Oliver Cromwell in Westminster Hall Gardens, adjacent to the Houses of Parliament, is proceeding apace. The pedestal is of Portland stone, and reaches a height of about 10ft., the top being level with the adjoining roadway. Mr. Hamo Thorneycroft, R.A., is putting the finishing touches to the bronze statue, which represents the Lord Protector in a standing position, and wearing the undress military uniform of the Commonwealth.

Engineering Notes.

Seaham Harbour.—At this South Durham port on Saturday, the foundation and coping stones of new docks were laid, and the first sods of two additional pits were cut, as part of the celebrations of the coming of age of Viscount Castlereagh, eldest son of Lord Londonderry. As a result of these improvements in the port and the commencement of new collieries, it is anticipated that Seaham Harbour will in the future ship between two and three million tons of coal per annum, as against 500,000 tons now shipped each year. For the purpose of developing the port the Seaham Harbour Dock Company was formed some time ago, with an authorised share capital of £150,000. The new works embrace the construction of two protecting sea piers on foundations which have been ascertained to consist of rock, the deepening of the entrance channel, the formation of a new deep-water dock on the sites of the present south dock and tidal harbour, and the provision of additional coal-shipping appliances. The present water area covers barely twelve acres, whereas the total area of water space inclosed by the piers and docks when the works are completed will be about 41 acres. The present docks have an area of $2\frac{3}{4}$ (north) and $2\frac{1}{2}$ acres (south) respectively, but the new dock when constructed will cover ten acres. It will have a depth of $27\frac{1}{2}$ft. The width of the entrance is to be 65ft., and the depth on the sill at high water of ordinary spring tides will be $25\frac{1}{2}$ft. The new dock will accommodate vessels up to 5,000 tons burden, and there will be 23 coal spouts, equipped with appliances of the most approved type. The deep-water dock will be ready for the reception of vessels in about two and a half years. The construction of the piers will require at least four years. The works have been designed by Mr. H. H. Wake, chief engineer to the River Wear Commissioners. Messrs. S. Pearson and Son, Limited, of London, have been intrusted with the carrying out of the works, under the supervision of Mr. P. W. Meik, of Westminster. The contract price is £378,000. This includes the provision of shipping staiths and spouts, lighthouses, dock-gates, hydraulic machinery, &c.

Widening the Highland Line.—Considerable progress is being made with the doubling of the Highland Railway between Blair Atholl and Dalnaspidal, and the work is to be completed in time for next season's traffic. The doubling of this portion of the line was begun fully a year ago, and after this has been completed, the line will also be widened south between Blair Atholl and Stanley, in order to cope with the increasing traffic to the north. The work being carried out at present between Blair Atholl and Dalnaspidal—a distance of eighteen miles—is of a very heavy description. Part of the line winds to the summit of the Grampians at a gradient of 1 in 70, until it attains an altitude of 1,484ft. above sea-level, which is the highest point of any railway in Britain, with the exception of the toy line which runs to the summit of Snowdon. The work is being carried out in two divisions of nine miles each, termed the Struan and the Dalnaspidal contracts respectively. In the former contract there are 33,000 cubic yards of soft excavation, and 32,000 cubic yards of rock excavation, while the Dalnaspidal section entails 75,000 cubic yards of soft and 18,000 cubic yards of rock excavation. The doubling of the line has necessitated the widening of fifty-five bridges, the masonry of which is in a forward condition. Those most difficult to negotiate are the viaduct at the south end of Struan station and the 60ft. arched bridge over the river Garry at Dalnaspidal. The former is being extended from 140ft. to 190ft., there being one girder span of 150ft. and one of 40ft. About six miles of permanent way have been already laid down. There are over 400 men employed on the work, which is estimated to cost £100,000, the contract being let to Mr. John Best, Edinburgh.

* * *

The Department of Works has commenced to take in hand the alterations that are to be carried out in order to adapt the Imperial Institute to its new purpose of housing the University of London.

Alterations are being made to the Welsh Chapel, Holloway, from the designs of Messrs. Owen and Payne, John-street, Bedford-row, W.C., and especial consideration has been given to the ventilation, which will be carried out on the Boyle system.

PROFESSIONAL AND TRADE SOCIETIES.

Architectural and Archæological Society of Northumberland.—A meeting of this Society was held at Corbridge and Hexham on Friday. At Corbridge Church the party was received by the vicar. Mr. R. O. Heslop gave a sketch of the parish church, and made reference to the fact that a large Roman station was at Corbridge. Mr. C. C. Hodges described the architecture of the church. At Hexham the visitors were welcomed by the rector in the Abbey, the choir of which was well filled. Canon Greenwell, the President of the Society, then gave a lengthy address on the early history of Hexham, mentioning that in his opinion Hexham had not been the site of a Roman station, although many Roman stones had been found in the Abbey and other buildings of the town. He also referred to St. Wilfred and his connection with the See of Hexham, and to his building of a church there, said to have been "the finest on this side of the Alps." Towards the close of his address, in his capacity as a member of the Hexham Abbey Restoration Committee, Canon Greenwell effectively replied to the criticisms which had been advanced upon the scheme for improving and extending the church by the Society for the Protection of Ancient Buildings. He expressed his warm approval of what was proposed to be done, and trusted the appeal of the rector for the necessary funds would meet with a generous response. The Abbey and its attendant buildings—the Moot Hall and Manor Office—were afterwards fully described by Mr. C. C. Hodges, the architect, who, in conjunction with Mr. Temple Moore, of London, has been intrusted with the carrying out of the rector's scheme for the reparation and improvement of the Abbey Church.

Cumberland and Westmoreland Antiquarian Society.—The second meeting for the season was opened at Workington on Thursday afternoon in last week. About fifty members were present, and the excursions were conducted by the President (Chancellor Ferguson) and Mr. J. F. Curwen. Burrow Walls, the site of a Roman camp on the fringe of the town, was first visited. Only the ruins of the original tower are now standing. The President suggested that useful work might be done by digging a few trenches. The members next proceeded to a square tower on the seabrows, known as St. Michael's Mount. The President stated that it dated from the 12th century. Later, it was one of the eleven beacons of Cumberland, and fires were kindled on the top to give notice of the approach of invaders. The tower is now used as a magazine by the Artillery Volunteers. After calling at St. Michael's Church, and inspecting the quaint carvings in wood and stone, the party brought the day's work to a conclusion by visiting Workington Hall, the seat of the Curwen family. Among many items of historical interest examined was a travelling clock and an agate cup presented by Mary Queen of Scots, who slept at the hall on her way from Kirkcudbright to Cockermouth, and a silver snuff-box presented by Cromwell to General Fairfax, who, according to legend, was madly in love with a Miss Curwen.

Leeds Master Builders' Association.—The annual picnic of the members of this Association took place at Harewood on Friday. After taking luncheon together at the Builders' Exchange Club, the members drove to Harewood viâ the Wetherby-road, Collingham, and the Avenue. Between Collingwood and the Avenue the party had a glorious view of Wharfedale, bathed in a bright afternoon sun. On Arriving at the Harewood Arms, the annual meeting of the association was held. Mr. W. H. Dews, vice-president, occupied the chair, in the absence of Mr. W. Nicholson, the president. Mr. W. C. Ellisdon, the secretary, read the annual report, which stated that the membership had increased by 28 during the year, and that the treasurer had an increased balance in hand. It was further stated that cordial relations existed with the masons, and that that branch of operatives had co-operated with the employers in the formation of a Joint Committee, to which future disputes were to be referred for settlement. The adoption of the report was moved by the Chairman, who referred to the loss which the association had sustained through the deaths of two of its members, Mr. E. Wray and Mr. G. Burnell. He alluded with satisfaction to the amicable arrangement that had been arrived at with the masons, observing that it was always a pleasure to meet their representatives in conference. As to the dispute with the London Order of Bricklayers, he said he saw no immediate prospect of a settlement. He had hoped that with the withdrawal of the Yorkshire lock-out the London Order would have returned to work on the old conditions, which seemed to have proved acceptable to the Manchester Order. So far as the masters were concerned, the season of the year was now approaching when building operations would cease to be profitable, and unless, therefore, a speedy settlement was effected, he feared the dispute would continue for a considerable time. Mr. William Irwin seconded, and Mr. E. Umpleby supported, the resolution, which was adopted. On the resolution of Mr. Irwin, seconded by Mr. J. T. Wright and supported by Mr. Umpleby and Mr. Hutchinson, Mr. Dews was elected president, and the other appointments were made as follows:—Vice-president, Mr. J. T. Wright; secretary, Mr. W. C. Ellisdon; committee, Messrs. Irwin, Myers, Nicholson, Rhodes, Umpleby, Pickard, Hutchinson, and Oakes. A special vote of thanks was accorded to Mr. Nicholson, the retiring president, for his services to the association and to the building trade generally. The party then visited Harewood Park, taking the opportunity that offered of inspecting the art treasures which the Mansion House contains, as well as the gardens and conservatories. The members returned in the late afternoon to Leeds, where, in the evening, the annual dinner was held at the Queen's Hotel, Mr. Dews, the president-elect, occupying the chair.

ARCHÆOLOGICAL.

East Riding Antiquarian Society. — An excursion of the members of this society took place on Thursday in last week. The members met at Withernsea, and proceeded in carriages to Kilnsea, a distance of some nine miles. The object of their visit was to see the foundations of the old church now under water, but which are visible twice a year, when the tide is at its lowest. Only the base of the tower remains. People still living remember the church in a fair state of preservation, for it was not till 1826 that it was dismantled and the roof taken off, after which the sea was allowed to work its will. The Rev. E. M. Cole said that in 1776 the church was 95 yards distant from the cliff, but in 1833 it was only four yards. After a brief visit to the kitchen-midden on the Humber shore, the members next proceeded to Easington, and inspected a 15th-century tithe-barn, its age being fixed by its carpentry, which is entirely innocent of even an iron nail, everything being pieced together by wood. It is said to be the only tithe-barn in England which has aisles, and at a pinch it would have served as a church. On their return journey the party stopped at the ruins of Out-Newton Chapel, which ten years ago Lord Hawkesbury, now President of the society, measured, and found to be 38 yards from the edge of the cliff; yesterday it was 19 yards, showing an erasion of the coast of 6ft. a year.

CHIPS.

The Board of Trade has confirmed the order for the construction of a light railway, which, joining the Great Western Railway at Marazion, near Penzance, will extend railway communication to the Land's End.

The War Office authorities have notified the Pembroke Town Council that steps will be taken to proceed with the erection of new infantary barracks at Pembroke Dock (the estimated cost of which is £88,000) as soon as the council is in a position to supply the contractors with water.

A carved oak altar and retable has been erected in the chancel of the parish church of Pagham, Sussex. The sanctuary floor has been raised, and the altar placed on the marble steps. It was designed by Mr. George P. Allen, architect, London, and was built by Mr. Foster, of Bedford.

New brickworks, on an extensive scale, were commenced at Blyth on Monday, by the Albion Brick Company, Limited, to work a seam of clay on the outskirts of Blyth, near the Cowpen Colliery. The royalty comprises 20 acres, leased from the Thornton and Croft trustees, and the seam of clay, which is 20ft. thick, and of good quality, lies only a few inches from the surface. The works are equipped to produce a daily output of about 20,000 bricks.

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ILLUSTRATIONS.

METROPOLITAN TABERNACLE, NEWINGTON BUTTS, AS REBUILT.—GRAND THEATRE, LUTON.—HOUSE AT EDWALTON.—A GARDENER'S COTTAGE IN KENT.—NATIONAL BRONZE MEDAL DRAWINGS: STUDIES OF BIRDS FROM LIFE.—"BUILDING NEWS" DESIGNING CLUB: A PAIR OF SEMIDETACHED VILLAS.

Our Illustrations.

THE METROPOLITAN TABERNACLE.

THE rebuilding of this large chapel after the late fire is now in progress, and we illustrate the plans and section of the work. The original front substantially remains as before. To obviate the great inconvenience to the congregation of being deprived of their building, the architects, Messrs. Searle and Hayes, of Ludgate-hill, E.C., suggested the idea of covering in the basement story, and finishing it so that it might be used for services. This has now been completed; the basement floor was lowered, new approaches formed, giving ample and convenient access, the roof being of iron and concrete, covered with asphalte, upon which the wood-block floor of the Tabernacle will be laid. By this means a lofty, well-lighted hall has been obtained, capable of seating some 1,800 people. The works were carried out by Messrs. Higgs and Hill, Ltd., at a cost of about £7,000. In reconstructing the superstructure, the contract for which is now in hand, the architects have been desired to adhere as closely as possible to the form and detail of the original building, which was designed by Mr. W. Willmer Pocock.

THE GRAND THEATRE, LUTON, BEDFORDSHIRE.

THIS theatre has been erected in Waller-street, in the centre of the town of Luton, for Mr. Reginald F. Turner, from designs and under the superintendence of Mr. Charles Herbert Shoppee, F.R.I.B.A., of John-street, Bedford-row, London, by Mr. W. G. Dunham, builder, Luton, and affords accommodation for an audience of about 1,500 persons. The theatre is constructed with fire-resisting material, is fitted with hydrants and sprinklers, and is heated throughout. The lighting is by gas, there being no electric system of lighting in Luton. It is faced externally with grey Luton bricks, relieved with quoins and dressings of red bricks and St. Aldhelm box ground stone for the cornices, strings, &c., and for the gable. The lower story is faced with dark-brown glazed bricks. The fibrous-plaster decorations internally are finished in white and gold, and were executed by Messrs. De Jong and Co., of London; the furniture and fittings were provided by Messrs. Broadbridge and Sons, of Brighton, the iron and steel work by Messrs. R. Moreland and Son, Ltd., of London, the lighting and heating apparatus by Messrs. Strode and Co., of London, the hydrants and fire-resisting curtain by Messrs. Merryweather and Sons, and the stage (which is fitted with all the latest improvements) by Mr. J. W. Cawdery, of London.

NEW HOUSE, EDWALTON.

THIS pencil drawing shows the garden front of Mr. W. Wright's house at Edwalton, near Nottingham, of which we gave a plan and view of the entrance side on November 18, 1898. Mr. William Smith, of Newark, was the builder, and Messrs. Brewill and Baily, of Nottingham, were the architects. The three reception-rooms overlook the gardens, as will be seen by reference to the plan. The staircase is in oak, and a good feature is made of the hall, which is unusually large.

GARDENER'S COTTAGE, KENT.

THIS cottage was designed for the late Dr. Barry. Red brick, oak half-timber, and Broseley tiles are combined in picturesque conjunction. Mr. W. E. Barry, of Scarborough, was the architect.

NATIONAL BRONZE MEDAL DRAWINGS OF BIRDS.

THIS sheet of bird studies illustrates the subjects so far conventionalised as to adapt them to decorative purposes, and with this effect in view, colour tones and light and shade are, to some extent, sacrificed. The drawings were made from life, and were executed in an aviary. The selection comprises the Siberian bullfinch, a series of budgerigars, and studies of the blue mountain lory. Mr. Harry Wanless, of Scarborough, the author of these two sheets reproduced by us today, obtained a National Bronze Medal for them, and one other sheet in which the thistlefinch was shown. The Hungarian Government bought that sheet when it was exhibited last year at the Buda-Pesth exhibition.

"BUILDING NEWS" DESIGNING CLUB: A PAIR OF SEMIDETACHED VILLAS.

(FOR description and awards see p. 255.)

CHIPS.

The new municipal hall at Rondebosch, Cape Colony, was opened by Sir Alfred Milner on July 17th. It has cost, with site, £13,000, and is a simply-treated building faced with stone from the Saldanha Bay Eureka Quarry. Mr. Alexander was the architect, and Messrs. Small and Morgan, of Cape Town, were the builders.

On Saturday the foundation-stone of the Oddfellows' Hall, which is being built in Tain by the Brethren of the St. Duthus Lodge, was laid with ceremony. Mr. James Maitland is the architect.

Redruth Urban District Council on Saturday appointed Mr. T. C. Jones, of Neath, surveyor and sanitary inspector, at a salary commencing at £110.

There was a dearth of business in the estate market during last week, the property sales amounting to £10,000 less than the corresponding week of last year.

Directions have been given for the preparation of a scheme for the reconstruction of the hospital quarters at the Tower of London.

New village schools to accommodate 224 children are being built at Park-street, Herts. They will comprise a mixed schoolroom for 96 children, 45ft. by 21ft. 6in.; a classroom for 48 children, 22ft. by 21ft. 6in.; and a schoolroom for 80 infants, 30ft. by 24ft., together with cloakrooms and offices. The work is being executed by Messrs. Boff Bros., of Park-street, in accordance with plans prepared by Mr. Frederick Waller, of 96, Gower-street, N.W., the surveyor for the St. Pancras district.

At Manchester two fresh open spaces were formally opened on Friday—a recreation ground in George-street, Openshaw, and a new park in Oak-road, Crumpsall. The former has an area of seven acres, and has cost the city corporation £13,000. When taken over the ground had a very irregular surface and was full of old clay pits. These had to be filled up by the slow process of "tipping," and then time had to be given to the new stratum to settle before it could be drained and trimmed off. Crumpsall Park is 12 acres in extent, and has cost in all £24,000.

A lecture on the history and antiquity of the church and rood screen of Ranworth was delivered in that church by the Rev. Canon Jessopp on Thursday in last week. The proceeds were in aid of the restoration of Ranworth church, which contains the finest rood screen in East Anglia. Mr. J. T. Micklethwaite, F.S.A., of Westminster, is the architect for the restoration.

The fourth Church Congress Exhibition of the Clergy and Artists' Association will be held at the studio of Leighton House (the residence of the late Lord Leighton), Holland Park-road, Kensington, W. The exhibition will remain open during congress week, and will include, in addition to the examples of work executed under the auspices of the association and by its members, representative examples of the work of individual artists and craftsmen working in churches. The Arab Hall and the collection of the late Lord Leighton's sketches and studies will be on view to visitors to the exhibition.

COMPETITIONS.

ALDERSHOT.—In our recent notice as to the decision in the Masonic Hall Competition at Aldershot, in respect of which Mr. Edwin O. Sachs in his report as assessor advised that no second premium could be awarded, as no one design showed sufficient superiority over the remaining to merit this distinction, it should have been added that Mr. Sachs in his report recommended that the second premium should be divided equally between the authors of the designs "Red Star" (mark) and "Mother Lodge," in recognition of the trouble expended on the elevations, and that the Directors of the Hall have now agreed to this proposal.

LEEDS.—Some time ago the Leeds Markets Committee invited architects to send in designs, plans, and estimates for the erection of a new Market Hall on the site of the present dilapidated-looking structure in Vicar-lane. In response to the advertisement, in which premiums were offered for the three best designs, a number of sketches and plans were received. These were submitted to the President of the Royal Institute of British Architects for his report and adjudication. He has sent his report containing his awards. The document was read at a meeting on Monday of the Markets Committee, who, after inspecting the plans, confirmed the decision of the assessor. To whom the premiums will be paid is not yet known, even by the committee, the plans not having been signed by the architects. The city engineer, Mr. T. Hewson, telegraphs that the names of the authors are still under seal. The design placed first is estimated to cost for erection £73,000. The second plan would require £55,000, and the third £43,000. The committee much preferred the first one, but have resolved to request the architect to reduce the estimate by £15,000 or £20,000.

CHIPS.

Mr. J. H. Bethell has received a letter from Mr. J. Passmore Edwards offering to give the sum of £4,000 for the erection of a hospital at the corner of Shrewsbury-road, East Ham.

Workmen are busily employed in clearing the site for the new library for North Bristol, which will be erected exactly opposite the Colston Girls' School in Cheltenham-road. The new building was designed by Mr. W. V. Gough, of Bridge-street, Bristol, and the contractors are Messrs. Wilkins and Sons, of the same city.

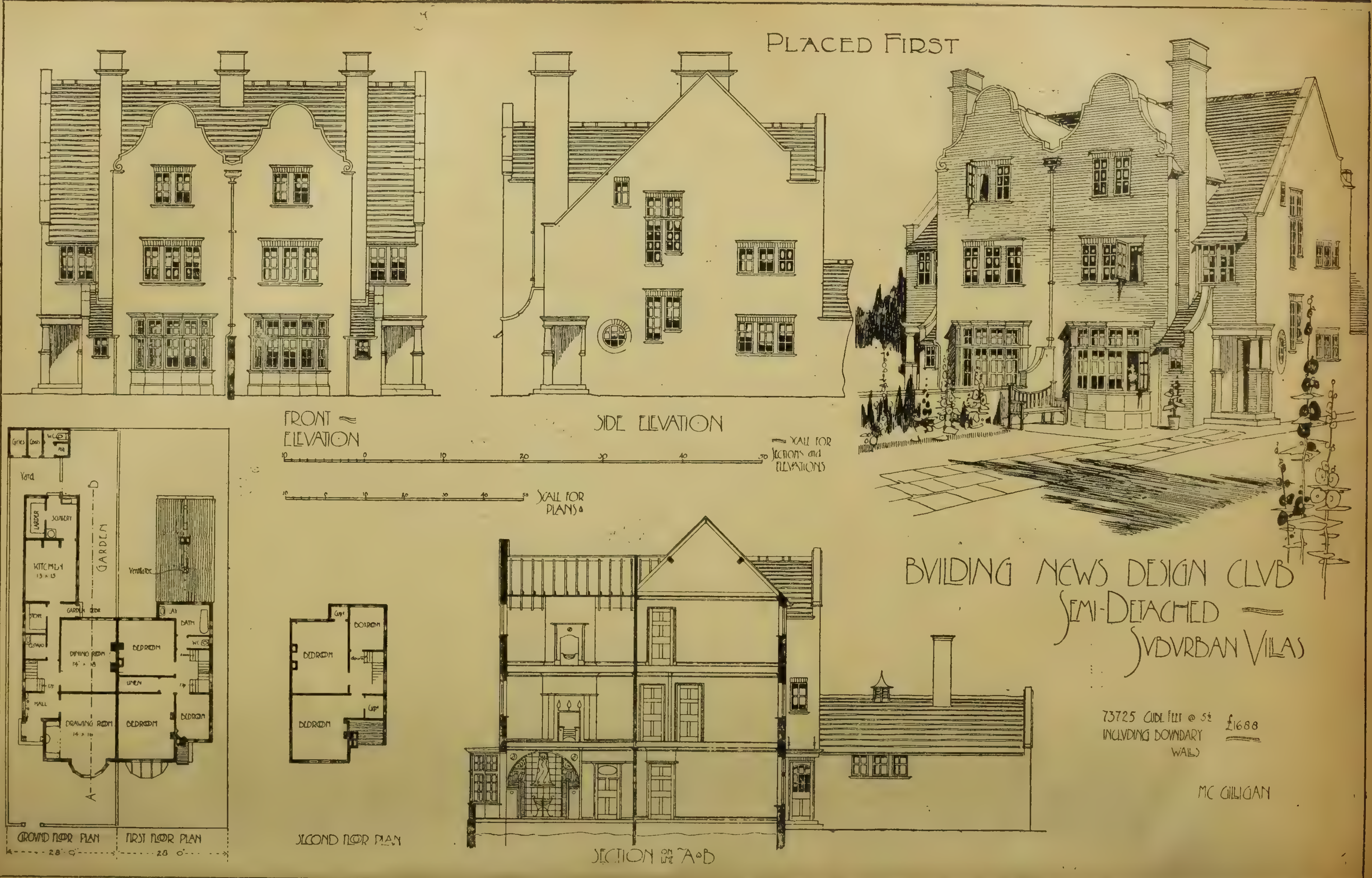
In the foundations of the new Chicago Post Office piles have been driven to a depth of over 75ft., these being surmounted by broad timber caps covered with a deep bed of concrete, which forms bases for the stone piers, which in turn support the 208 steel columns carrying the building. It is said that in this foundation, when completed, there will have been used over 5,000 piles, nearly 800,000ft. board measure of timber capping, 150,000c.ft. of concrete, and over 350,000c.ft. of stone.

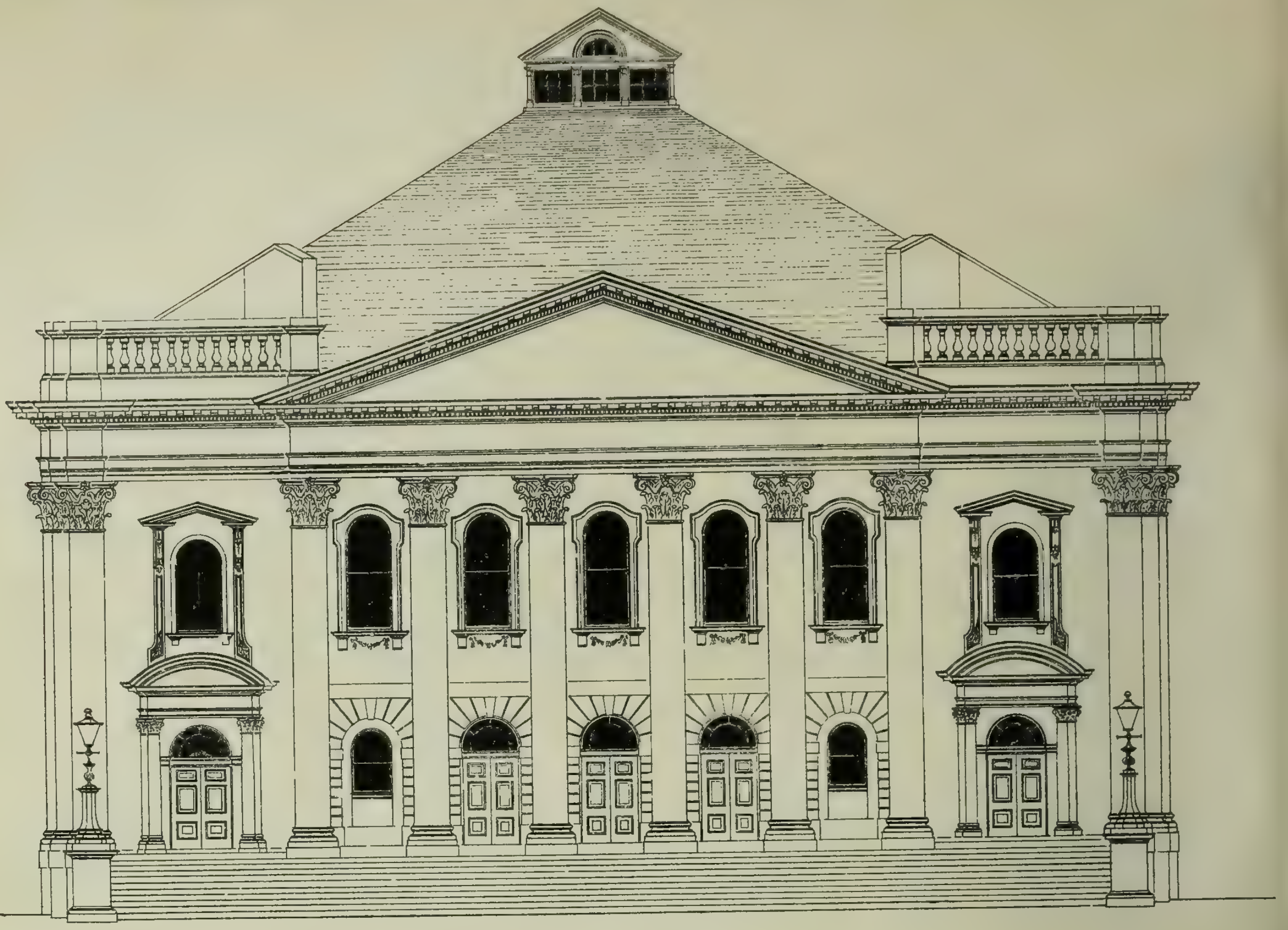
During the course of operations in demolishing the old buildings in Exchequer Row area, Aberdeen, the corporation workmen have made some interesting discoveries of relics in the house which in the 17th century was the mansion of the Burnet family, the ancestors of the Burnets of Monboddo, the Burnets of Crathes, Sheriff Burnet, Aberdeen, and others. The town council have agreed to grant a request of Sir Thomas Burnet of Crathes that the arms of the Burnet family on a finely-sculptured stone should be handed over to him.

A stained-glass window has been placed in St. Clement's Church, Greenheys, Manchester, to perpetuate the memory of Mr. Jackson, who was for many years a warden. The subject is "The Good Samaritan," and the artists were Messrs. Wailes and Strang, of Newcastle-on-Tyne.

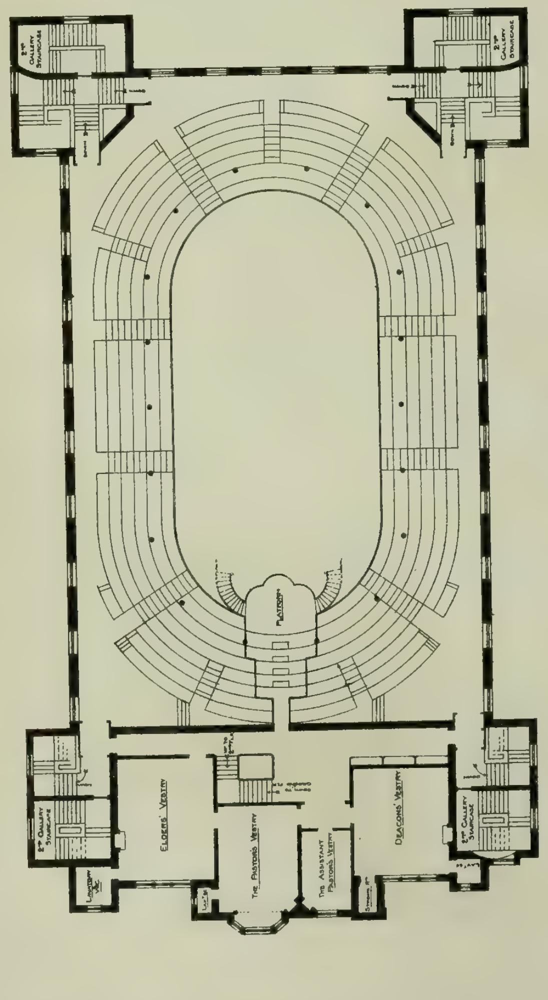
It will be remembered that the Town-hall of Pietermaritzburg, Natal, was destroyed by fire on July 12 last year. Plans have been prepared for the reconstruction of the building by Mr. Street Wilson, the tender of Messrs. Mowat and Still has been accepted for the contract, and on Saturday, July 9, the mayor of the town laid the foundation-stone of the new work. Mr. McAuslin is the contractor for the masonry work, Mr. D. Mackay, of Durban, contractor for the plastering work, and Messrs. Collins and Co. have charge of the decorating.

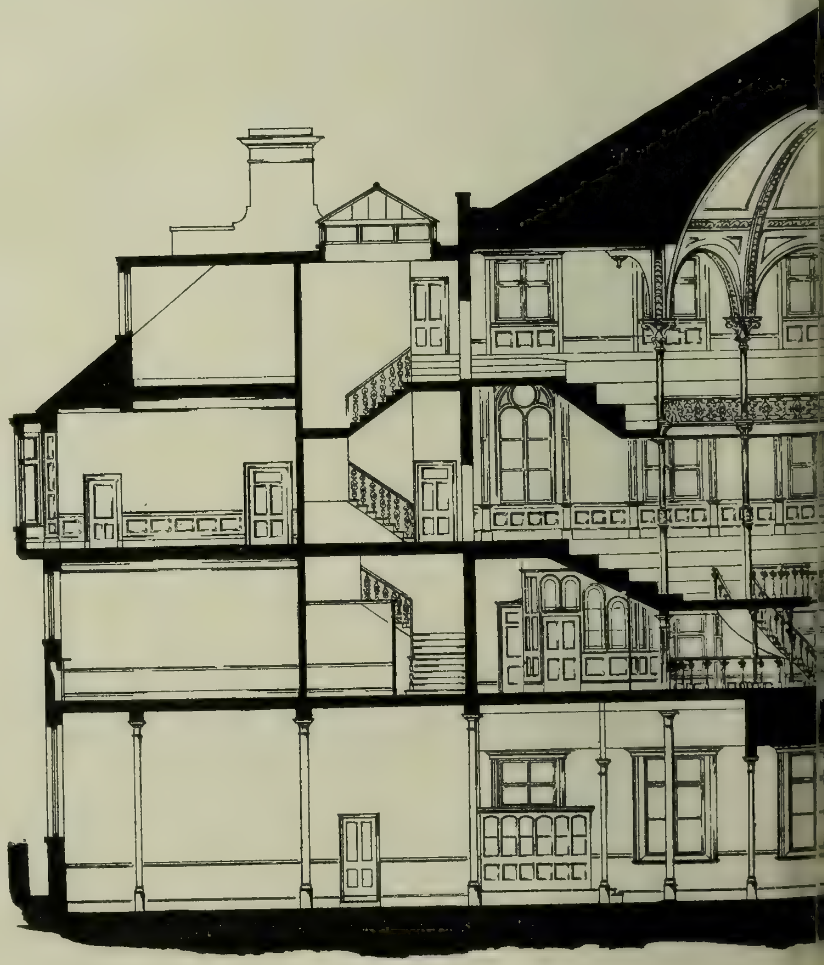
At the last meeting of the election committee of the Institute of Sanitary Engineers the following new members were elected—viz.: Fellows, T. R. Nash, London, and C. Dunkley, Higham Ferrers. Members, W. H. Baker, Bristol; J. S. Hammond, Romford; and T. W. Deadman, St. Margaret's. Associates, H. E. Brown, Peckham, and J. W. Hammond, Romford.


PLACED FIRST
FRONT ELEVATION
SIDE ELEVATION
SCALE FOR SECTIONS and ELEVATIONS
10 0 10 20 30 40 50
SCALE FOR PLANS
BUILDING NEWS DESIGN CLUB
SEMI-DETACHED SUBURBAN VILLAS
73725 CUBE FEET @ 5½ INCLUDING BOUNDARY WALLS
£1688
MC GILLIGAN
Yard
Grtes
Coals
W.C.
Ash
LARDER
SCULLERY
KITCHEN 13 × 15
GARDEN
GARDEN DOOR
STORE
CLOAKS
DINING ROOM 14' × 18
DRAWING ROOM 14 × 16
HALL
UP
A
B
Ventilator
BATH
W.C.
BEDROOM
LINEN
UP
BEDROOM
BEDROOM
GROUND FLOOR PLAN
FIRST FLOOR PLAN
28' 0"
28 0"
Cupd
BOXROOM
BEDROOM
down
Cupd
BEDROOM
SECOND FLOOR PLAN
SECTION ON LINE A.B

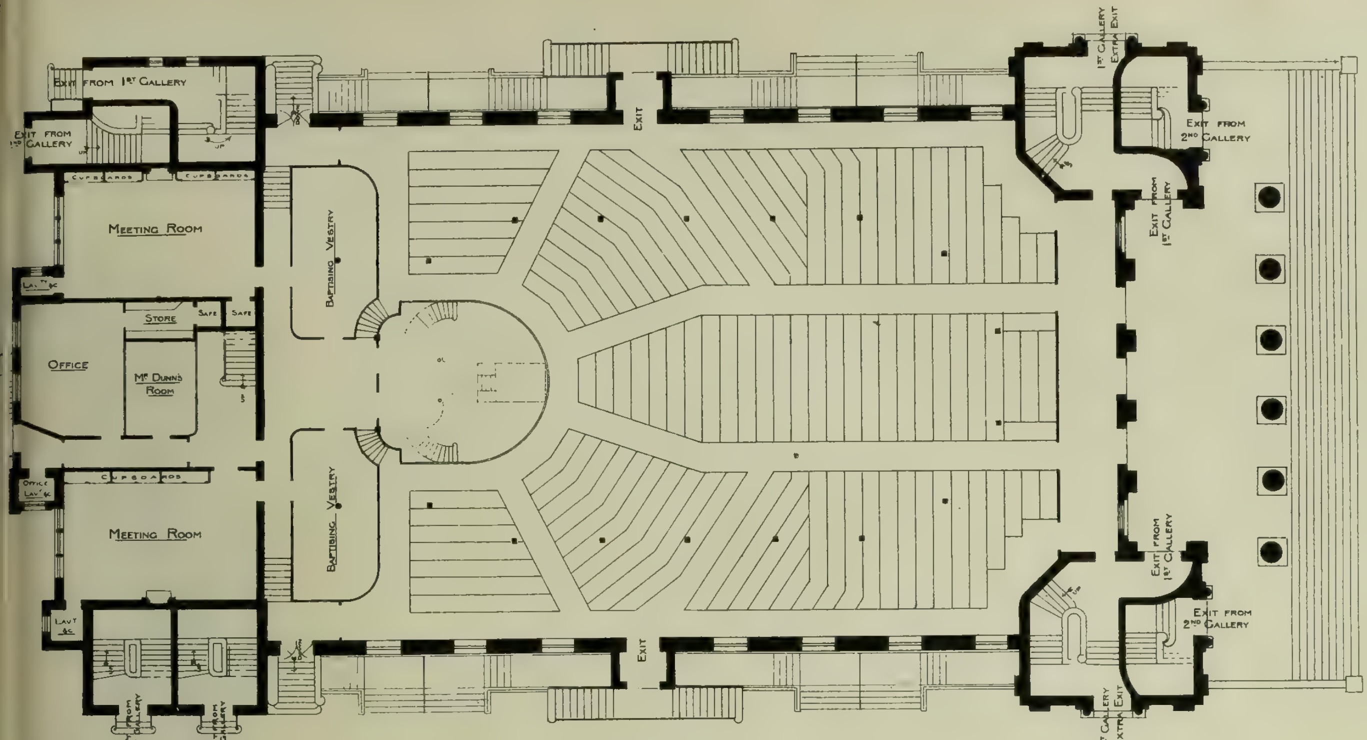


— East Elevation —

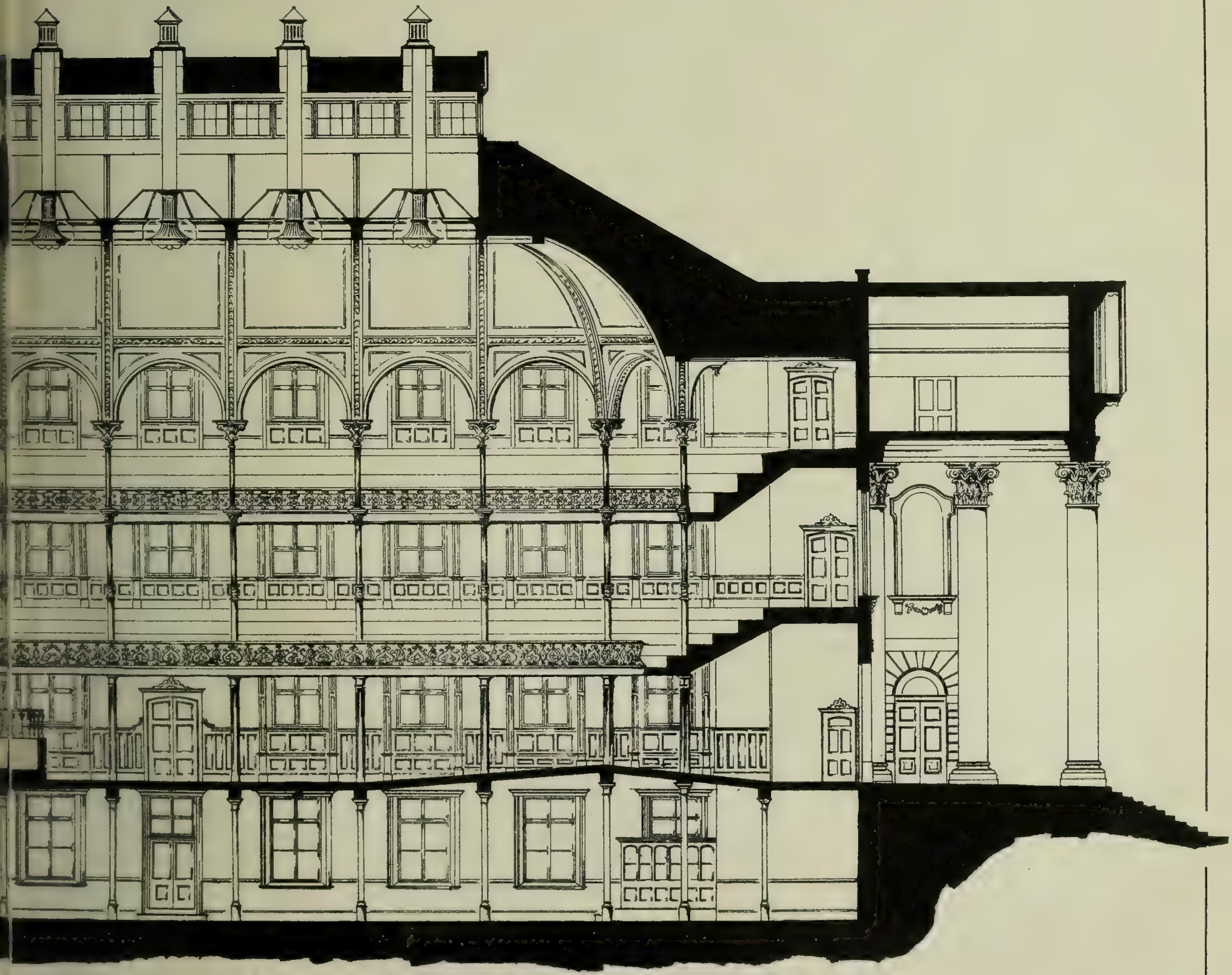




THE METROPOLITAN TA
SEARLE



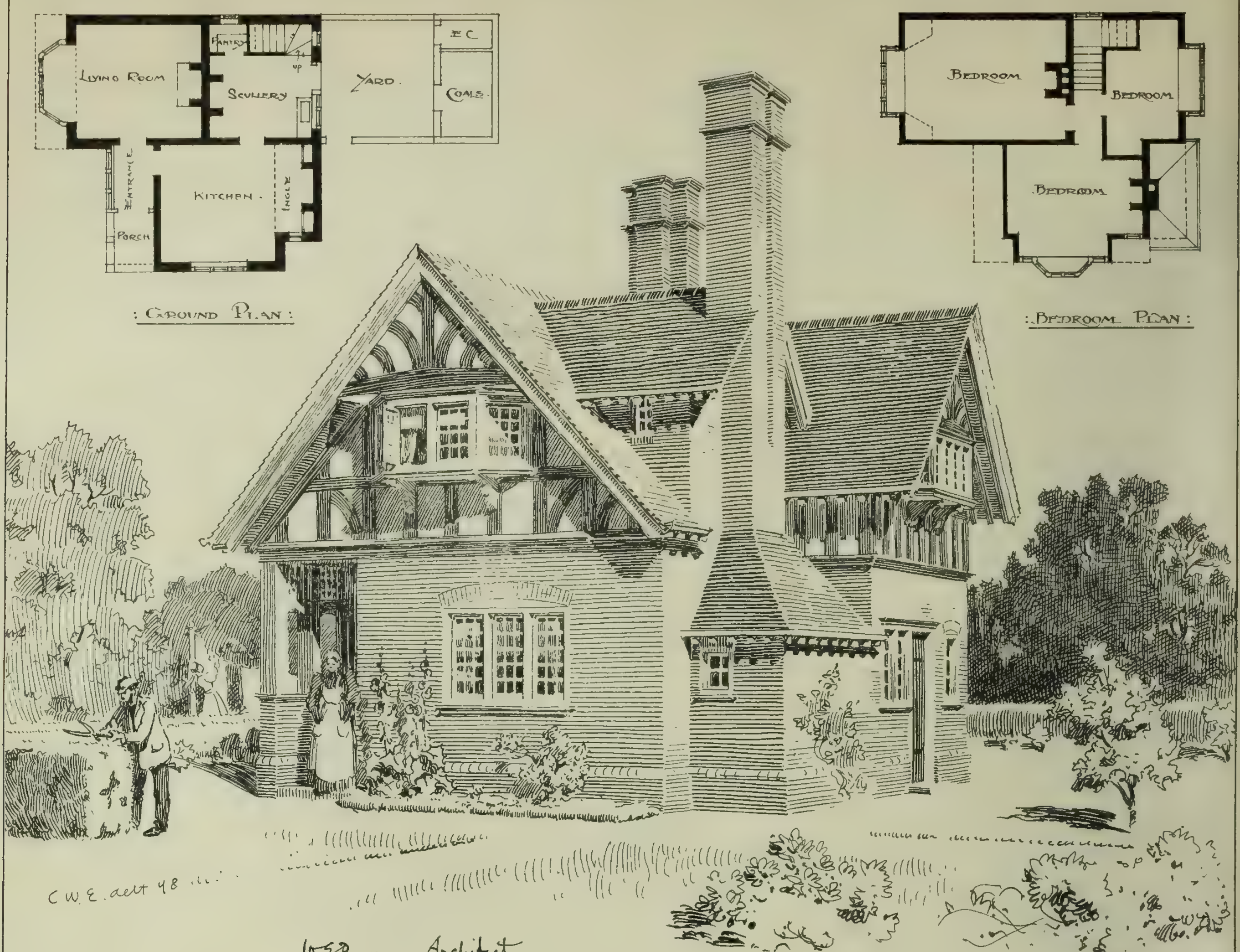
GROUND FLOOR PLAN



ACLE NEWINGTON BUTTS

AES ARCHTS

Photo-Lithographed & Printed by James Akerman. 6, Queen Square, W.C.



W. E. Barry - Architect.

: A Gardeners Cottage :
: Kent :

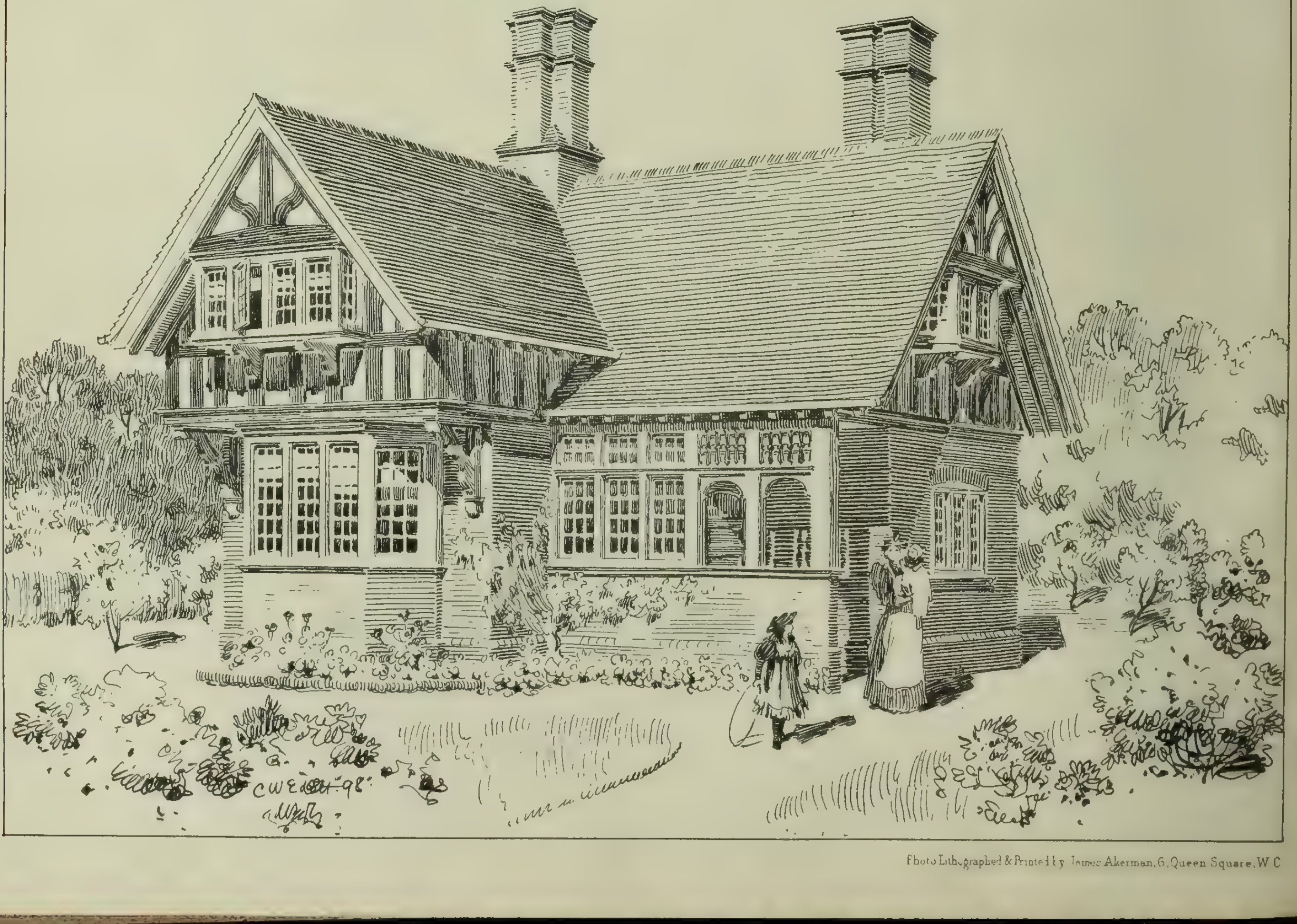
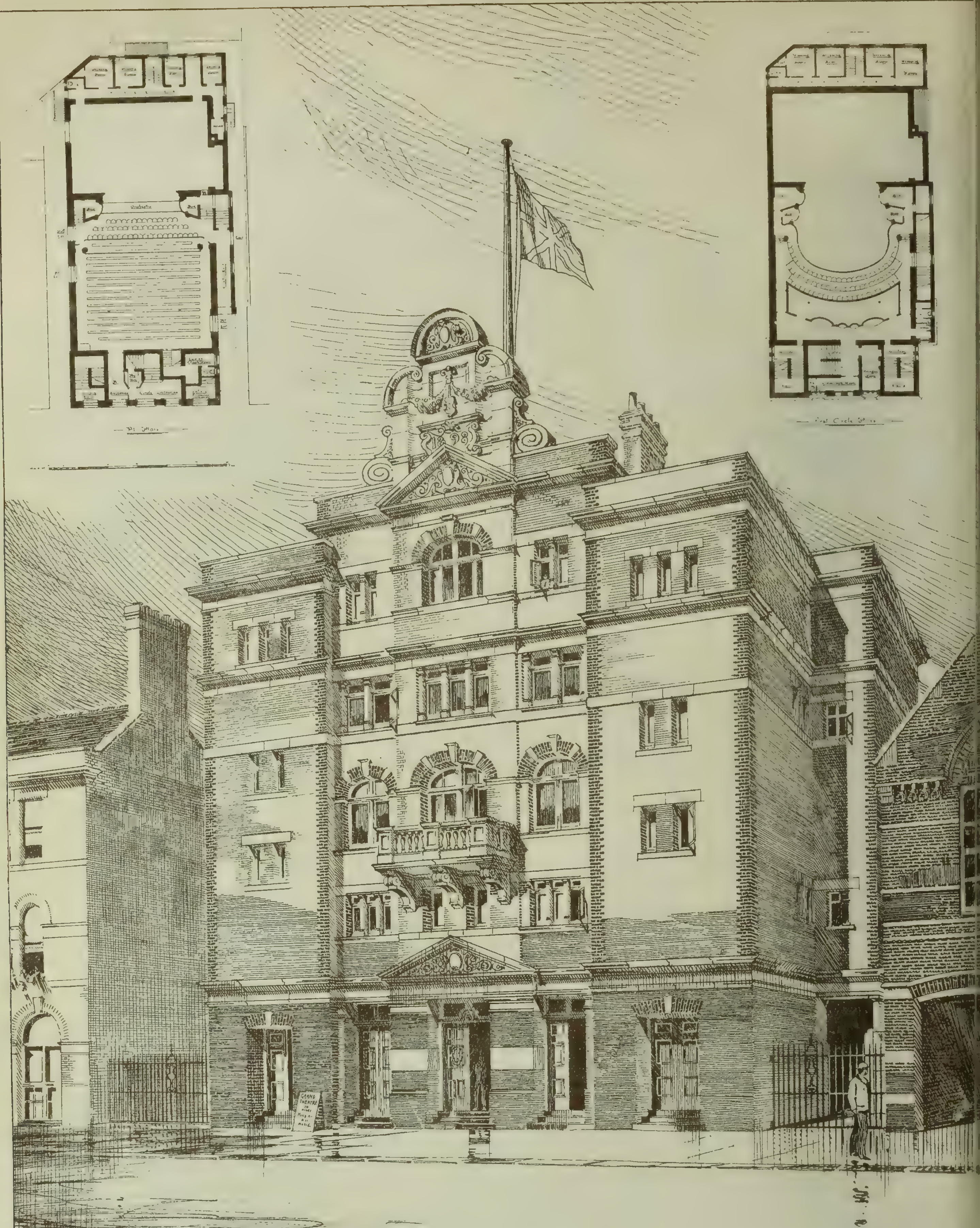


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



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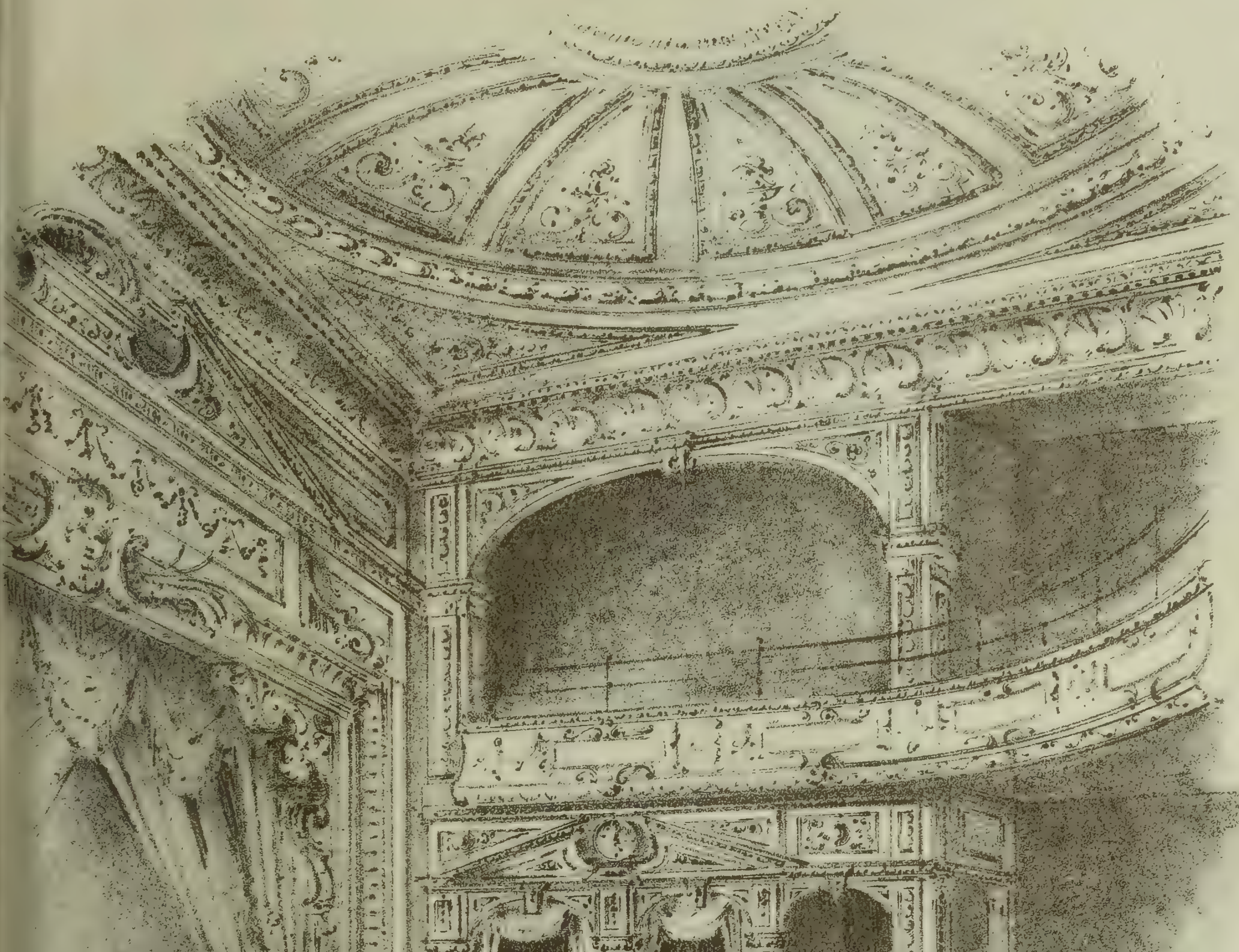
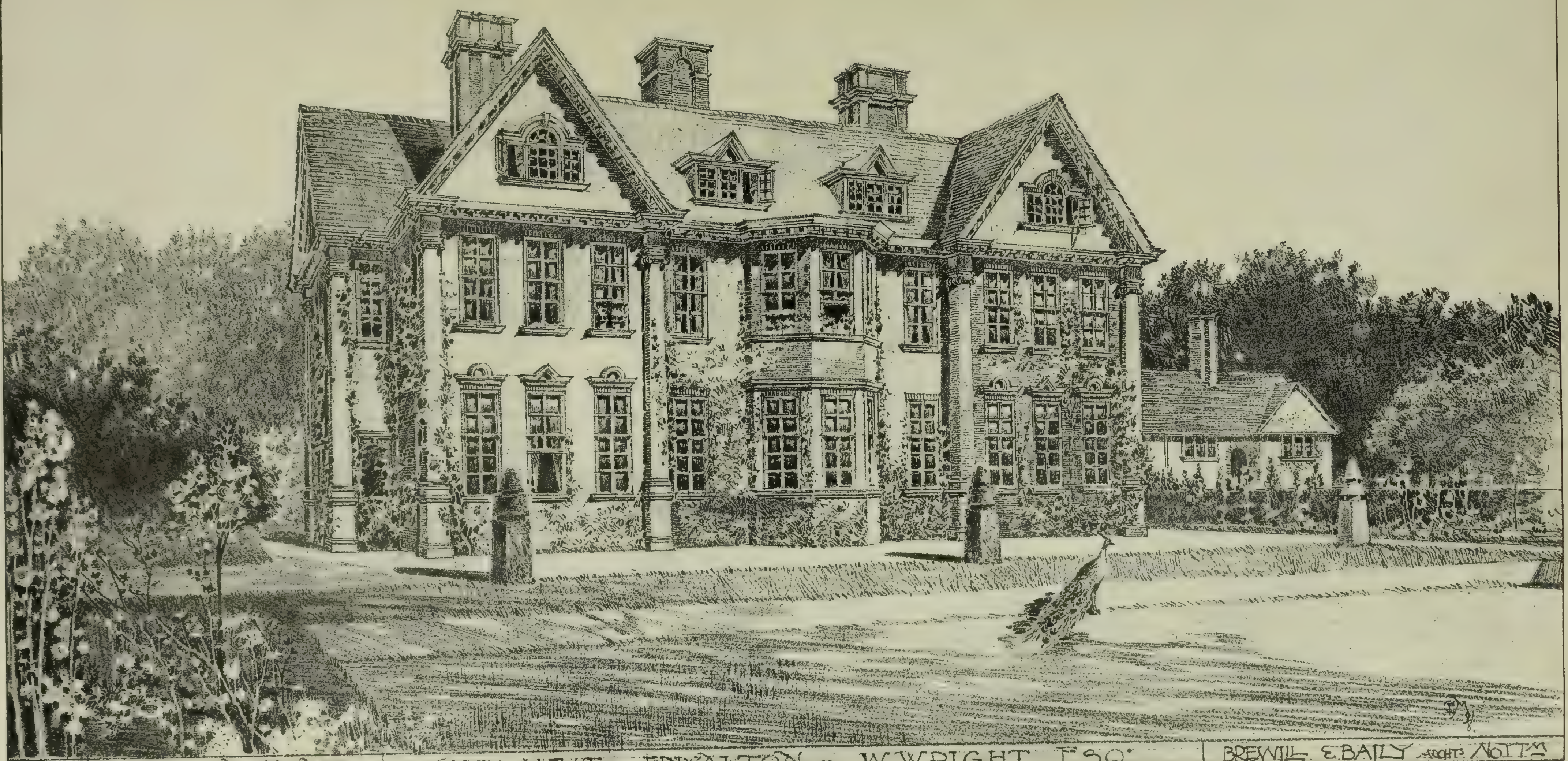


ATRE LVTON

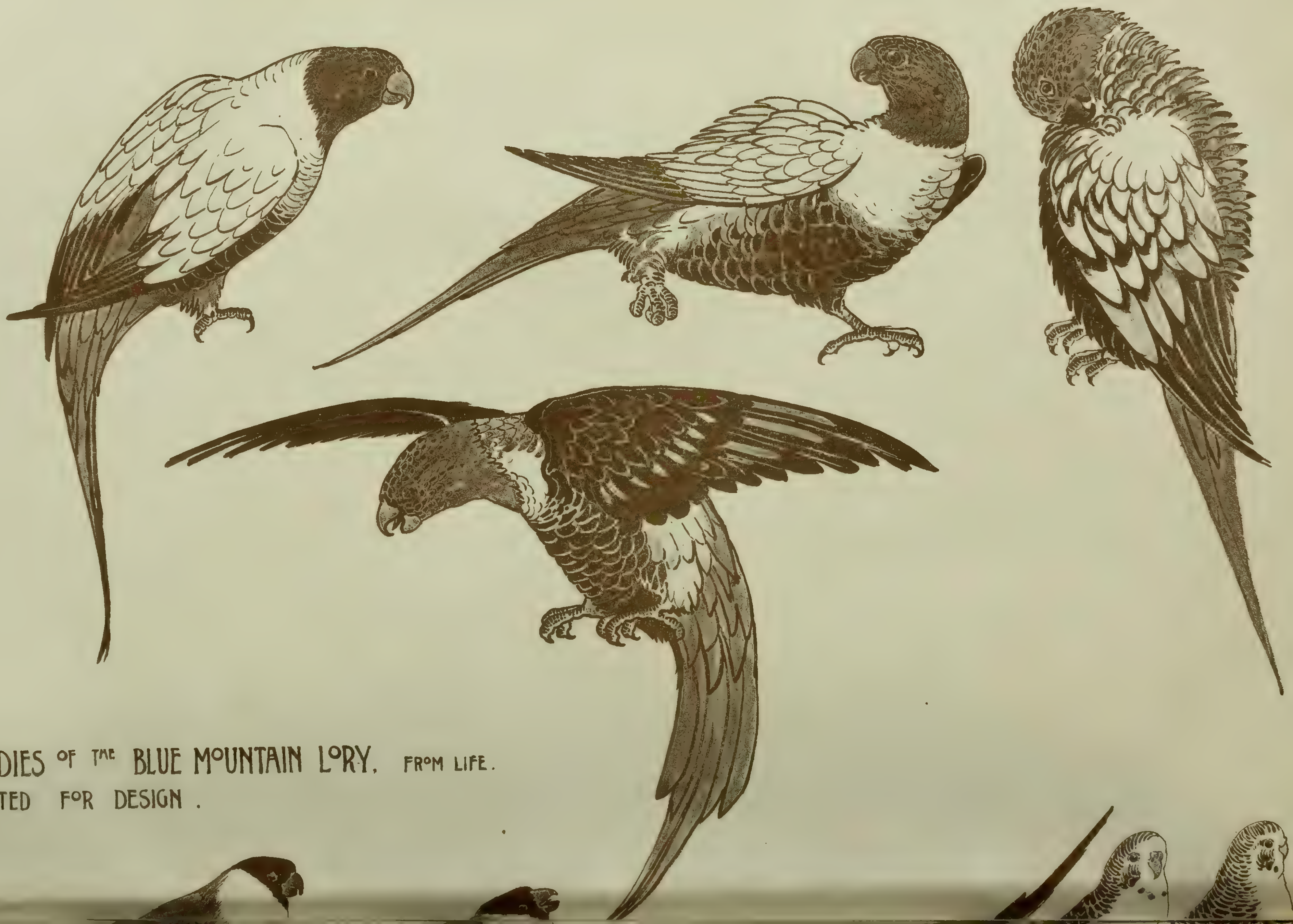
CHAS. HERBERT SHOPPEE F.R.I.B.A
ARCHITECT.

"PHOTO-TINT" by James Akerman, Queen Square London W.C.

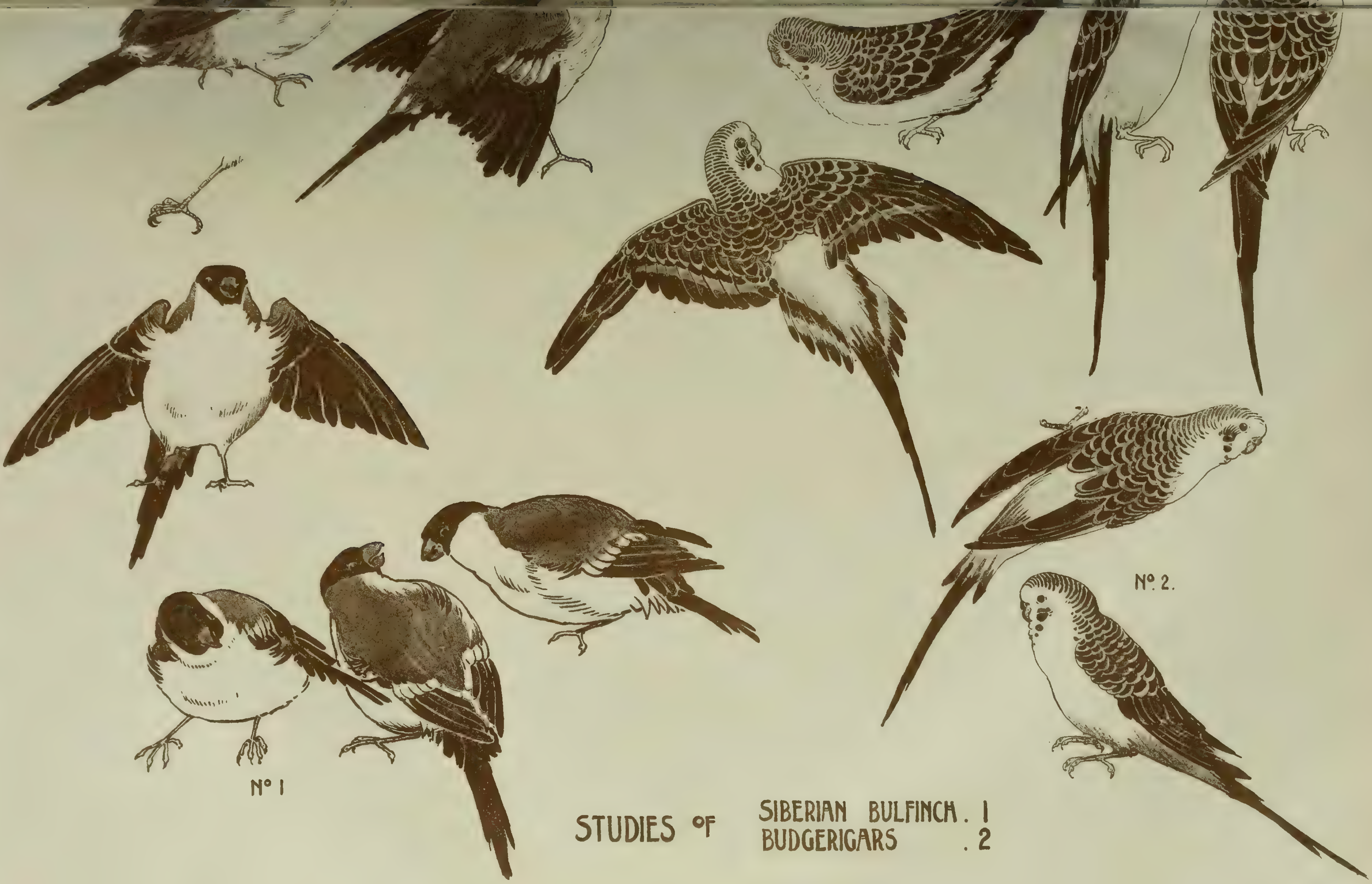


VIEW OF GARDEN FRONT | NEW HOUSE AT EDWALTON FOR W. WRIGHT ESQ. | BREWILL & BAILY ARCHTS NOTTM

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.



STUDIES OF THE BLUE MOUNTAIN LORY. FROM LIFE.
TREATED FOR DESIGN.



STUDIES OF SIBERIAN BULFINCH. 1
BUDGERIGARS . 2

PHOTO-TINT, by James Akerman, 6 Queen Square London W.

NATIONAL BRONZE MEDAL DRAWINGS OF BIRDS BY H. WANLESS.

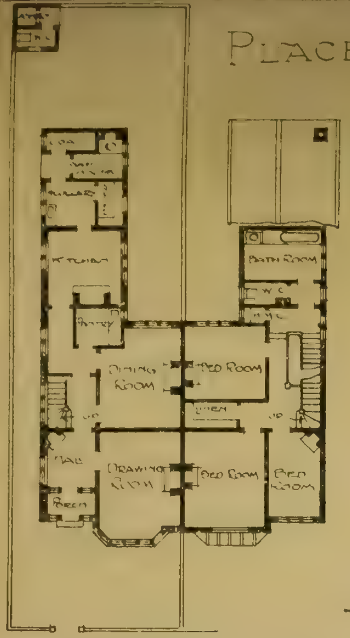
BUILDING · NEWS · DESIGNING · CLUB

SUBJECT · I

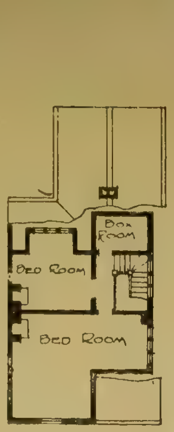
A PAIR OF SEMI-DETACHED HOUSES

"THISTLE."

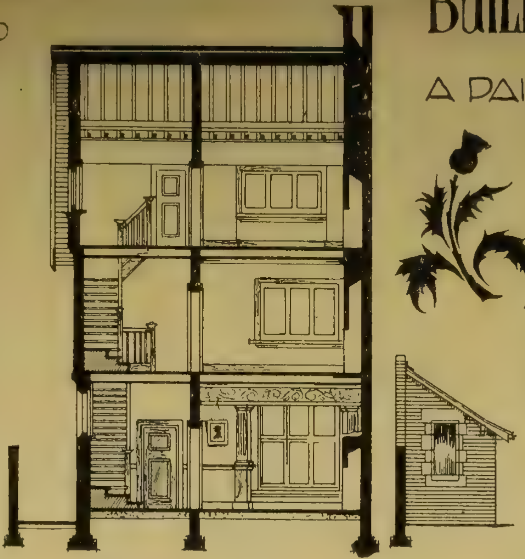
PLACED · SECOND



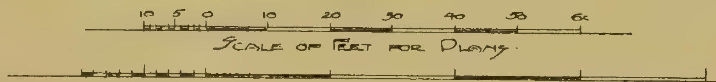
GROUND FLOOR PLAN FIRST FLOOR PLAN.



SECOND FLOOR PLAN

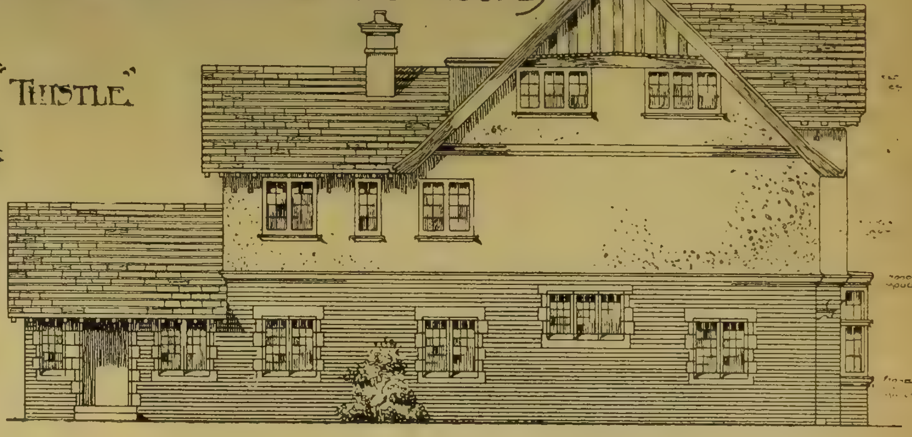


SECTION.



SCALE OF FEET FOR PLANS.

SCALE OF FEET FOR ELEVATIONS.

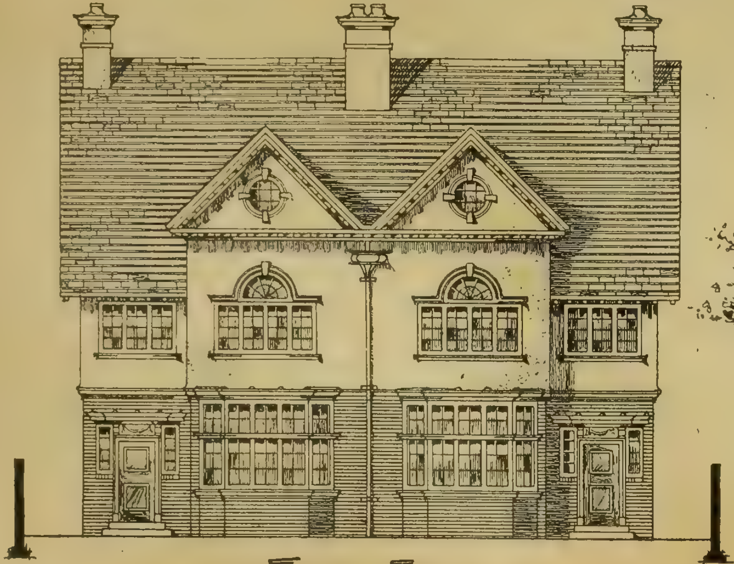


· SIDE ELEVATION :

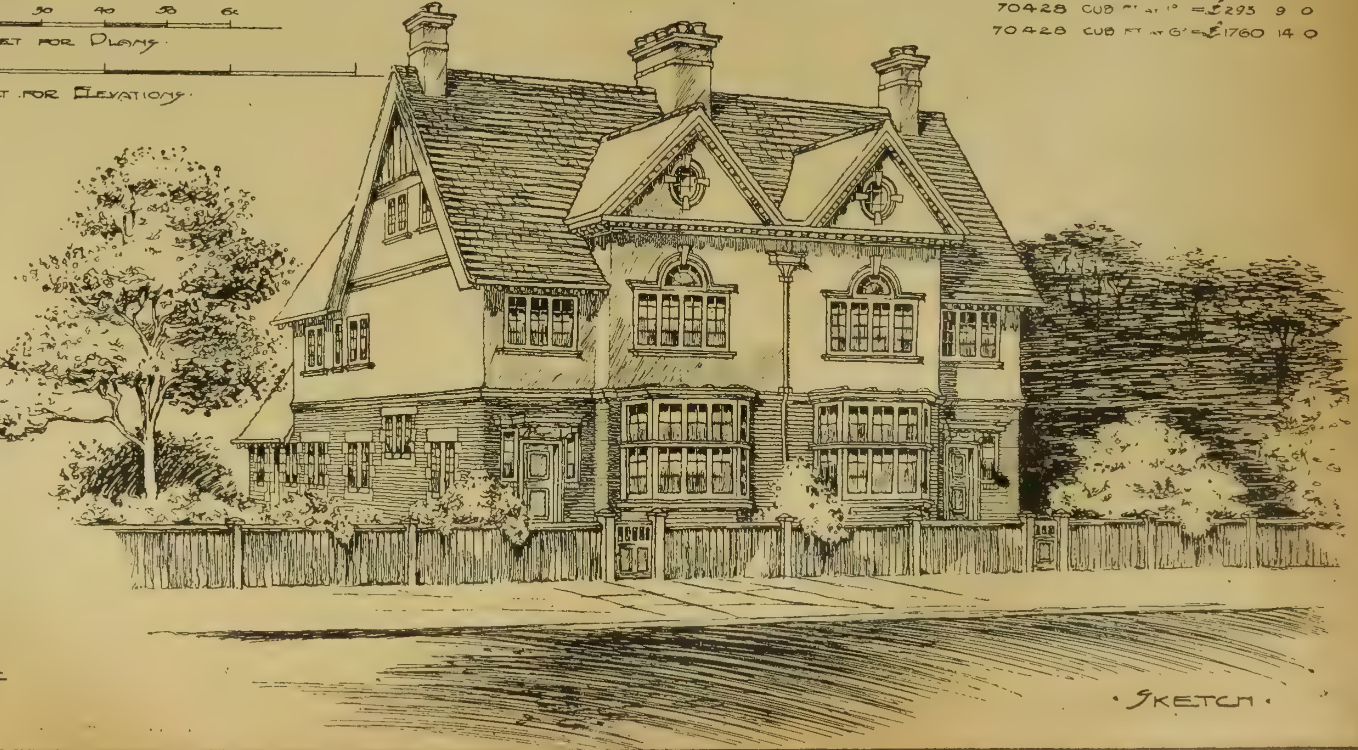
CUBING

70428 CUB FT AT 1D = £293 9 0

70428 CUB FT AT 6D = £1760 14 0



· FRONT ELEVATION ·



· SKETCH ·

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—A. J. P. of B.—W. P. and S.—J. K.—L. E. —A. R.—R. W. P., B.—S. and W., N.—C. T. R.—E. H. S. and B.—J. B. N. C. (next week)—W. R. of S. —R. H.—T. C.—G. P. A.—G. W. of B.i.F.—H. H.—R. B. and S.—G. M. F. H.—C. A. S.—J. H. M.—F. A. A.—E. O. S.

Intercommunication.

QUESTIONS.

[12304.]—**Reversed Roman Letter in Date.**—Shall feel obliged if some reader can give me the value of a reversed Roman letter used as a numeral. A party of students were rubbing brasses in a church near Upminster, Essex, and stumbled over the reading of the date; I forget for the moment the exact lettering, but it ran something like: MDCƆXIX. What is the value of the capital C turned upside down?—Live and Learn.

[12305.]—**Utilising Sawdust.**—I make a large quantity of shavings and sawdust, and although I have a steam-engine, I am unable to use them for fuel. The draught of the engine draws the material up the chimney only partially burnt, causing a nuisance to the neighbours. How can I remedy this? Details of how to make fire-lighters from shavings and sawdust would oblige.—Sawdust.

REPLIES.

[12288.]—**Instructions to Obtain Tenders.**—"Inexperienced" should have obtained definite instructions from his client to prepare quantities before preparing the same. The client, however, seems to have been aware that quantities had been prepared, otherwise he would not have instructed the contractor to strike out the charges. The quantities also appear to have been used for the purposes of tendering, and the fact that the contractor states he could not have tendered without them proves that they were useful, and would in the ordinary course form one of the contract papers. Although the writer does not know of any legal decisions upon the point, he imagines "Inexperienced" would have a good case.—Charles T. Ruthen.

[12288.]—**Instructions to Obtain Tenders.**—Instructions to obtain tenders generally imply an authority to have quantities taken out, because tenders to be of any value must be based on the same quantities of material and labour. There are cases in which builders are invited to give tenders, each taking out their own quantities. It is quite irregular for owner to deal with builder as he has done, by ordering him to strike out charge for quantities. It was equally wrong for builder to accept contract under such condition, as his tender was based upon it presumably. The owner may not have given a direct order to have quantities prepared, but there is an implied authority given, as I have said, if the architect is instructed to obtain tenders, and I think legally the architect can sue the owner for their cost. The Courts have generally considered that to obtain tenders, quantities ought to be supplied; therefore a contract to obtain them falls within the scope of the architect's employment, but the decisions have not been conclusive on the point, and the Court requires some proof that a special custom to employ a surveyor exists. Muon v. Guardians of Witney Union is the recognised decision, and the verdict was given for architect. Other cases rather contradict this ruling.—G. H. G.

[12289.]—**Commission on Drainage Scheme.**—The commission would be, on a small scheme like the one mentioned, 5 per cent. at least on the actual outlay. This commission should cover the surveying and preparation of plans and superintendence of the works; but a special fee, say two or three guineas, could be charged for attending the Local Government Board inquiry. This charge would greatly depend upon the amount of time taken up by "W. F. J." in preparing for the inquiry. Any other meetings attended could be charged for.—Charles T. Ruthen.

[12289.]—**Commission on Drainage Scheme.**—The commission would depend on the nature and trouble involved in the scheme—probably 4 to 5 per cent. would not be too much. Surveying area and attending Local Government Board inquiry should be charged for extra. A drainage scheme may involve difficult levels and the construction of large sewers and outfalls, different sections of drains, &c., and the charge in such a case ought to be made on the amount of labour involved, which must vary in every case. For a simple system of pipe-drains a commission of 2½ to 3 per cent. may be sufficient.—Surveyor.

[12290.]—**Parchment.**—The dark, greasy-looking spots which appear on damped parchment are common enough on some skins. Pouncing is the only method I have adopted in drawing plans and tinting them on parchments. No doubt these parchments are defective. In some cases the spots show through the colour washes and produce a spotty appearance.—One Who has put Plans on Deeds.

[12293.]—**Wood Paving.**—There are several kinds of wood used for paving in London. Baltic red wood is used on the Strand (one of the busiest thoroughfares in London); the timber is very carefully selected, and the blocks are accurately cut to the size, 9in. by 3in. by 6in. Before being used they are dipped in creasote. The joints are run with a hot bituminous mixture. The cost per superficial yard, laid complete, with bituminous joints, is about 7s. 9d. The wood-blocks are laid upon a concrete bed, about 9in. thick, which costs about 15s. per cubic yard. The cost of excavation is, of course, added to the above.—Charles T. Ruthen.

[12293.]—**Wood Paving.**—"Countryman" is probably thinking of Jarrah wood. It costs about per yard super. 15s. for 5in. deep and 13s. for 4in. deep.—Regent's Park.

[12294.]—**Ordnance Datum.**—The information you seek is really elementary, and findable in most works on surveying—e.g., G. W. Usill's "Practical Surveying," 1889, Crosby Lockwood and Co.—viz.: Determined by the O. authorities to be approximate mean water at Liverpool, and all levels marked on O. sheets are altitudes in feet above this datum, so that in N. of Scotland, Wales, Southampton, or Yarmouth, all over the United Kingdom, whenever a figure preceded by a dot (thus: ·33·6 or ·336·0) is upon a map, it shows in one case 33ft. and $^{60}/_{100}$th of a foot, and in the other 336ft. above this datum respectively. Not usual to adopt the O.D. in ordinary levelling, but to assume some convenient depth below the lowest point of the section, the reason for which is that all altitudes shall be above this datum, so that there will always be positive and never negative heights, &c.—Regent's Park.

[12294.]—**Ordnance Datum.**—The statement engraved upon Ordnance maps means exactly what is stated—viz., the altitudes are given in feet above the approximate mean water at Liverpool. "Datum" will notice upon ordnance maps figures at various points, thus, ·66, or in the case of a map showing buildings, the ordnance bench-mark would be cut upon a wall or the corner of a house, and would be marked with a broad arrow, with the three points directed downwards. These marks are the levels, at the particular position marked, above a fixed datum line, this datum line being mean water level at Liverpool—Charles T. Ruthen.

[12295.]—**Architect's Charges.**—"Query" is not quite clear as to what he is desirous to know. An architect may legally charge for preparing plans, obtaining tender, and superintending the works, 5 per cent. on the actual cost of the said works. This is, of course, if the architect does not make a special agreement with his client. You cannot charge a percentage for preparing quantities if they were not prepared.—Charles T. Ruthen.

[12295.]—**Architect's Charges.**—It is usual for an architect to charge ½ per cent. on lowest tender for the trouble in obtaining tenders. There is some labour and trouble involved; they have to be invited by advertisement or by letter, and the architect has to supply information and to answer qustions as to details. It is a custom, and, I think, legally chargeable.—G. H.

[12297.]—**Masonry and Stonecutting.**—"A Student" should read Tarn's "Science of Building." Perhaps this may aid him. Semicircular arch having all the voussoirs of equal depth, the weakest joint is that which makes an angle of 30° with horizon, or at one-third of the distance from the springing of the crown. It is at this point that the horizontal thrust of the arch has its greatest effect on the abutments; it increases with the size of the arch, being generally proportional to the square of the span. If the height of the abutment from the ground to the springing of the arch is equal to the radius or half span of the arch. For a greater height of abutment a greater thickness will be necessary. Also "Practical Masonry," P. Nicholson, 1852.—Regent's Park.

[12299.]—**Water-Lifting.**—The only method to lift the water required would be by means of a force-pump. Is it to be understood that "Waterloo" requires to force 11,000 gallons per hour a distance of 500 yards every hour? The size of the pump and of the engine would greatly depend upon the number of hours this amount would require to be pumped. The engine is very small if 11,000 gallons have to be pumped every hour regularly. The distance is also an objection (from the engine to the tank), as the pump would have to be worked by means of belting. Messrs. Tangyes, of Birmingham, would be able to supply a pump which would do the work.—Charles T. Ruthen.

[12299.]—**Water-Lifting.**—The simplest, cheapest, and most assured as to avoidance of clogging is by a centrifugal pump driven by the steam-engine. A 3in. c. p. costing, say, £12, including foot-valve and grating, using, in this case, 4in. suction or force pipes, would do the work most effectively. The pipes would cost about 2s. per foot of length, including jointing materials. They must be laid well underground to avoid water freezing; a means for draining them when not in use should be provided. Revolution of pump disc about 1,500 per minute. H.P. required about 5. The pump should, of course, be placed near the engine, and driven by a bolt, and the vertical section height should not exceed 15ft., the pipes having a regular rising gradient from the foot-valve in the pump, and perfectly air-tight. A self-acting check-valve on delivery-flange of pump, with a small outside charging-pipe and cock between its upper and under surfaces is advisable.—Old Hand.

[12299.]—**Water-Lifting.**—Does "Waterloo" require a cheap makeshift apparatus to raise this quantity (p. 248) once, or an efficient pumping plant for raising the quantity at daily or weekly intervals?—C. D.

[12301.]—**Sundial.**—"D. C." should try ordinary cement. I have made two sundials. The dials are made entirely of ordinary cement mixed with fine gravel; when it has dried it is as hard as slate, and then painted with white paint. The styles are brass pins, and are fixed on the dials when the cement is wet. When the cement is dry they are perfectly solid. "D. C." might try cement or cement with fine gravel mixed.—T. R.

[12301.]—**Sundial.**—Melted sulphur and Portland cement are both good. Clear out holes, set pins central, and run with the sulphur or cement.—C. B.

[12303.]—**Mensuration.**—The smaller and larger hexagons being exactly as 3 to 4, and their difference 813in., this is also the area of one-third of the inner hexagon. Dividing it by $\sqrt{\frac{3}{4}}$, which is ·8660254, we get 938·77154 for the area of a square the radius of your circle. Multiplying this by 3·14159265 gives 2949·2446 for the circle's area.—E. L. G.

[12303.]—**Mensuration.**—Let n = number of sides, r = radius of $\odot$.

$$\text{Area of inscribed hexagon} = \frac{n\,r^2}{2}\ \sin.\ \frac{360^\circ}{n}.$$

$$\text{Area of circumscribed hexagon} = n\,r^2\ \tan.\ \frac{180}{n}.$$

$$\frac{n\,r^2}{2}\ \sin.\ \frac{360}{n} = \frac{6\,r^2}{2} \times {\cdot}8660 = 2{\cdot}5980\,r^2.$$

$$n\,r^2\ \tan.\ \frac{180}{n} = 6\,r \times {\cdot}5774 = 3{\cdot}4644\,r^2.$$

$$3{\cdot}4644\,r^2 - 2{\cdot}5980\,r^2 = 813\text{sq.ft.}$$

$${\cdot}8664\,r^2 = 813$$

$$r^2 = 938{\cdot}4 \text{ approx.}$$

$$\therefore r = 30{\cdot}63.$$

$$\text{Area of } \odot = (30{\cdot}63)^2 \times 3{\cdot}1416 = 2947{\cdot}63\text{sq.ft.}$$

—J. Wight, Lasswade.

CHIPS.

The *Wakefield Diocesan Gazette* states that the late Mr. W. S. Whitehead, of East Ardsley, retired engineer, who died on August 2nd, has, by his will, left a considerable sum to the Bishop of Wakefield for general or special purposes in connection with the cathedral. The amount, which comes out of the residuary estate, has not yet been made known.

The Finance Committee of Glasgow Corporation have given Mr. J. S. Sargent, A.R.A., the commission to paint the portrait of Lord Provost Richmond, who retires from the chair in November next.

The Corporation of Bolton, which had previously expended £90,000 on the construction of sewers and and sewage works on the precipitation and intermittent flow system, have just expended a further sum of £76,000 to obviate the pollution by effluent of the Manchester Ship Canal. The works now undertaken, for which Messrs. Hinnell and Murphy, M.Inst.C.E., were the engineers, include a conduit, 6,946 lineal yards long, from the existing sewage works, to pass 15 to 17 million gallons per day of 24 hours. It is 3ft. 6in. in internal diameter, of brick, bedded in concrete where ground is bad, with culverted watercourses across streams, iron pipes inclosed in concrete under canals, and iron pipes on cast-iron girders supported on stone piers over the river Irwell.

Mr. J. Passmore Edwards, it is announced, in addition to his gift of £3,000 towards the cost of the erection of the West Ham Museum, has promised another sum of £1,000 towards its equipment.

Mr. Herbert H. Law, Local Government Board inspector, held an inquiry at Altrincham on Friday into an application of the Urban District Council for sanction to borrow the sum of £22,000 for the construction of a new outfall sewer, and the purchase of land adjoining the council's present sewage farm at Woodcote, near Altrincham.

LEGAL INTELLIGENCE.

Arbitration as to the Winsford Reservoir.—Arbitration proceedings in respect of the certain deductions made from the account of Mr. P. H. Matthews, of Nantwich, the contractor for the Winsford Reservoir, commenced last week, when Mr. G. Eaton Shore, borough engineer, of Crewe, sat as arbitrator in the case in the Winsford Council Room. The proceedings have been continued this week. Mr. J. H. Cooke, clerk to the council, conducted the case for the Winsford Urban District Council, and was assisted by Mr. H. Bancroft, C.E., of Manchester, the council's engineer to the scheme. Mr. A. Such, clerk of the works, gave material evidence in support of the council's case, while Mr. Matthews, who was accompanied and assisted by his son, gave rebutting evidence in respect of each item in dispute.

The N.A.P. Window Company, Limited.—The adjourned meetings of creditors and contributories of this company were held on Friday, at the Carey-street offices of the Board of Trade, before Mr. A. S. Cully, Assistant Official Receiver. The original meetings were reported in our issue of August 4, p. 149. The accounts filed under the winding-up order showed liabilities £13,986, of which £8,957 were expected to rank, and assets £3,992, after deducting £4,931 for claims of debenture bondholders. The deficiency as regarded the contributories was returned at £34,964. The chairman said the meetings were adjourned in order to give the parties interested an opportunity of formulating a scheme of reconstruction. No scheme had yet been placed before him, but the business was being carried on by a receiver for the debenture holders. Mr. Yeatman, representing George Newnes, Limited, the petitioning creditors, said a scheme was being prepared, and would in all probability provide for the issue by the reconstructed company of £10,000 first debentures for cash, and of second debentures to the holders of the first debentures in the present company, also for the allotment of preference shares in the new company to the present creditors. After some discussion the meetings were further adjourned until October 20.

In re G. R. Cook, Margate.—The East Kent Official Receiver has made his observations respecting the failure of George Robert Cook (trading as G. R. Cook and Son), of 4, Zion-place, and 8, Hanover-place, Margate, builder. Debtor's liabilities are estimated at £1,334 14s. 5d., and there is a deficiency of £713 18s. 6d. His failure is attributed to losses on building contracts. Debtor commenced business in 1891 as a builder with a capital of £130. Up to the beginning of 1898 he appeared to have carried on the business successfully, and to have acquired a capital of about £800, all of which, however, he subsequently lost on unprofitable contracts. A meeting of creditors was recently held, and an offer of 10s. in the £ made. The offer was rejected. Property possessed by debtor had been sold by auction, and realised £640.

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The executive committee appointed to select a picture to represent Sir Edward Burne-Jones in the National Gallery have an offer from the executors of the Earl of Wharncliffe of that superb example of the late master's genius, "King Cophetua and the Beggar Maid." The offer is made subject to the approval of the Court of Chancery, and the price named is £6,500.

The County School, Heath, is being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators, and special inlet brackets, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The restoration of the Thames and Severn Canal has proved a more difficult business than was anticipated. This waterway is 37 or 38 miles long, with 44 locks, and all but about four miles of it had fallen out of use, and had gone more or less to decay. To restore it to a navigable condition about £20,000 was borrowed, and after three years of steady work the canal was so far restored that boats actually made the passage from the Stroud Canal at Wallbridge to Lechlade on the Thames—the whole length of the waterway. The canal has, however, developed leaks at several places, and the water had to be drained off, and the puddling resumed.

The Duke of Connaught visited Dundee on Saturday, and opened the Victoria Hospital for Incurables, and unveiled a statue of her Majesty. The Incurables Hospital, which occupies a charming site in a wooded park overlooking the Tay, has cost £50,000, the whole of which has been raised. It consists of the old mansion of Balgay, greatly renovated and enlarged, while the surrounding grounds now form a public park. The Queen's statue has been erected on the north side of the Albert Institute. It is of bronze, 4ft. 4in. in height, and rests on a red granite pedestal, 9ft. high, having three bronze bas-reliefs and three grey granite steps. It was the last work of the late Mr. Harry Bates, A.R.A., and cost £3,000.

WATER SUPPLY AND SANITARY MATTERS.

Berhampore Waterworks.—The opening ceremony in connection with this undertaking was performed by the Lieutenant-Governor of Bengal on July 31. The head works are situated on the river Bhagirathi, a short distance outside the town on the up-stream side, the supply being taken from the river, and distributed to the town after filtration. The intake consists of an 11in. cast-iron suction pipe, 900ft. long, connected direct to the pumps, which are placed in a dry well. The pipe is laid in a masonry tunnel, so that the joints, which are flanged, can be inspected at any state of the river. There is also a branch high-level suction leading into this pipe, which can be used when the level of the river is high. Means are provided for flushing these pipes to prevent silting. There are no foot-valves, the suction being charged by an ejector. The water is pumped first over brick weirs into three settling tanks, 71ft. by 101ft. The floors of these tanks are covered with concrete; the sides are 10ft. wide at the top, and slope both ways 1½ to 1, the inside slopes being covered with 3in. of khoa, with a brick on edge layer pointed with mortar, and the outside slopes turfed. The water is drawn from each of these tanks into the filter-beds by means of a floating wrought-iron pipe, 10in. in diameter, the mouth being covered with a strainer. The filter beds, two in number, 103ft. by 78ft., are sand filters of the usual type. The filtering material consists of layers of pebbles, coarse sand, coke-breeze, and inches of fine sand. The filtered water is pumped into an elevated reservoir near the Municipal Office, 1½ miles from the works. The reservoir consists of a covered-in wrought-iron circular tank, 48ft. in diameter and 10ft. deep, supported on brick arches. From the reservoir the water is distributed to the town by stand-pipes in the streets. The works were designed and carried out under the superintendence of Mr. A. E. Silk, sanitary engineer to the Government of Bengal. The contractors for the works were Messrs. Martin and Co., of Calcutta. The engines, which are of the compound Worthington surface-condensing type, were supplied and erected by Messrs. James Simpson and Co., London. The final estimate for the works amounted to about £28,000 sterling. The works are designed for a constant service, the daily supply for Berhampore being estimated at 200,000 gallons.

CHIPS.

The Duke of Northumberland unveiled on Sunday at St. Nicholas' Cathedral, Newcastle, a memorial brass to the officers, non-commissioned officers, and men of the 1st Battalion of the 5th Northumberland Fusiliers who perished during the Soudan campaign of 1889.

The workmen employed in the excavation necessary in connection with the new premises for Guy's Hospital made, on Saturday, a discovery of Roman remains of much interest. The site is very near to St. George's Church, in the yard of the old Talbot Inn. The discovery consists principally of Roman vessels of earthenware, most of them much broken, an Etruscan earthenware lamp, horseshoes, and bones.

The Accrington Corporation have decided to open out a new highway leading from Whalley-road to Burnley-road, which involves the building of an exceptionally strong bridge over the Lancashire and Yorkshire Railway. This and the Blackburn-road improvement will probably cost the town £50,000.

The North Manchester Synagogue, in Bury New-road, was consecrated on Friday. The synagogue was formerly known as the Salem Chapel, and was built about half a century ago by the Methodist New Connection, and, together with the adjoining hall and schools, has been acquired by a Jewish congregation. The chapel has seating accommodation for over 800 persons—500 downstairs and 300 in the gallery. The purchase price agreed upon was £3,800, and the cost of adaptation will raise the expenditure to about £6,000.

The memorial-stone of the new board school at Ocker Hill, Tipton, was laid on Monday. It will be a mixed and infants' school, capable of accommodating 650 scholars, and will be fitted with every modern requirement. It is being erected by Messrs. Whittaker and Co., Dudley, to the plans of Mr. Alfred Long, architect to the Board, the style being Free Classic. There will be a tar-paved playground and a caretaker's house, the total cost being between £6,000 and £7,000.

The corporation of Southampton are inviting tenders for the reconstruction of the permanent way of their lines of tramway between Southampton Dock Station and Portswood, and, acting on the recommendation of Messrs. Kincaid, Waller, and Manville, of Westminster, they will seek Parliamentary powers next session for doubling the existing lines and carrying out extensions to Cobden Bridge, Millbrook, Northam Bridge, and the borough boundary at Portswood.

Our Office Table.

The curriculum of instruction for the classes of the Architectural Association for the session 1899-1900 is succinctly set forth in a small pamphlet just issued by the secretaries, Messrs. G. B. Carvill and R. S. Balfour, from the A.A. Studio, 56, Great Marlborough-street, W. The courses of lectures will commence on Monday, October 9, and cover a wide range of subjects, including construction and materials, drainage, water supply, ventilation, lighting and heating, Classic, Mediæval, and Renaissance architecture in England and throughout Europe, colour decoration and water colour, professional practice, specifications and estimates, quantities, mensuration and land surveying, strains and stresses, modelling, sketching and perspective; while among the lecturers and instructors are included such well-known names as Messrs. Henry Adams, Percy Buckman, Max Clarke, A. O. Collard, F. R. Farrow, Alfred H. Hart, F. E. Hulme, H. J. Leaning, W. G. B. Lewis, F. W. Pomeroy, H. B. Ransom, Herbert A. Satchell, R. Elsey Smith, and A. W. Weedon. The class fees are moderate, and a valuable series of studentships, medals, and prizes is awarded.

The syllabus for the ordinary meetings of the Architectural Association, held, as in former years, on alternative Friday evenings at the R.I.B.A. hall, 9, Conduit-street, W., gives an attractive programme. It is as follows:—October 6, Annual General Meeting — address by the President, G. H. Fellowes Prynne, and distribution of prizes; Oct. 20, Conversazione; Oct. 27, "The Construction of Circular Stairs and Spiral Vaults," by Lawrence Harvey; November 10, "Marble," by W. Brindley; Nov. 24, "Art as Applied to the Weaving and Printing of Textile Fabrics," by Sir Thomas Wardle, of Leek; December 15, "Colour Decoration in Relief," by Gerald Moira; January 26, 1900, "Cast Iron," by W. R. Lethaby; February 9, "Working-class Dwellings in Blocks," by Thomas Blashill; Feb. 23, "The Exterior Treatment of Sharp or Acute Angles in Street Buildings," by A. W. Hennings; March 9, "Small Houses," by C. E. Bateman; March 23, paper not announced at present; April 6, paper by Basil Champneys; April 27, "The Paris Exhibition," by E. H. Bennett; May 4, Members' Soirée; May 11, "Egyptian Temples," by Alexander Payne, and election of officers; and Thursday, May 31, Annual Dinner.

We are glad to hear that our old and racy correspondent, Lord Grimthorpe, who was seized with a paralytic stroke on Friday in last week, is making satisfactory progress. The latest bulletin from Blatchwood, St. Alban's, is that his condition is hopeful, although he is somewhat depressed. He is able to sit up in his dressing-room, but although absolute rest is enjoined, there is, as might be anticipated, great difficulty in keeping him from working. He has not been allowed to see any of the numerous visitors who have called. The veteran restorer of St. Alban's Cathedral, who is in his 84th year, is now the senior Queen's Counsel, having been appointed five-and-forty years ago.

A picturesque group of gabled buildings in the Market-place of St. Alban's is threatened with demolition preparatory to rebuilding for a firm of wholesale chemists. The house now proposed to be rebuilt forms the north end of a block of plastered tenements, and has a gable end with an overhanging upper story fronting the Market-place and St. Peter's-street. The building is one of the best known and most pictuesque spots in the city, and is visited by artists and archæologists as a valuable example of ancient domestic architecture; it bears the date of 1637, a portion of the building being probably earlier than that date. As seen from the doorway of the town-hall it forms a distinctive feature of the foreground together with the gables and high-pitched roofs of French-rowon the left, the battlemented Clock-tower, which rises above chimneys and dormers, while dominating all is the massive Norman tower of the Abbey Church. A petition to the new owners expressing a hope that in carrying out the needed alterations the interesting character of the house will be preserved as far as possible (especially the north and east fronts) has been drawn up by Mr. F. S. Kitton, and has been numerously signed, among the signatories being Sir Arthur W. Blomfield, A.R.A., the Bishop, and present Mayor of St. Alban's.

The London County Council have made the disappointing discovery that they have no legal power to acquire land outside the County of London for the erection thereon of working-class dwellings. Two eminent counsel—Mr. Lawson Walton, Q.C., and Mr. Haldane, Q.C.—have expressed an opinion to this effect on a case laid before them, based on the interpretation of Part III. of the Housing of the Working Classes Act of 1890. The result has been to place the Council in an embarrassing position, not only in regard to the limitations of the scope of its housing operations, but especially in reference to the generous offer of Sir Samuel Montague, M.P., to convey to the Council about 2[illegible] acres of land at Edmonton for the purpose of the erection of working-class dwellings. This gift could only be accepted under Part III. of the Housing of the Working Classes Act, and, thinking that they possessed the necessary powers, the Council some months ago decided to accept the offer. They now find themselves in the awkward position of being unable, through lack of statutory power, to accept the gift, and upon the reassembling of the Council in October the whole matter of the projected gift, and the desirability of seeking for an extension of powers in the desired direction, must come up for consideration.

A special meeting of the City Council of Manchester was held on Wednesday in last week to receive and discuss the report of the Committee on the question of the Royal Infirmary site. The terms the Committee recommended the Council to accept were that a total sum of £350,000 should be paid to the Infirmary (including £50,000 to be obtained by public subscription), and that the Infirmary should retain 3,000 yards of the land as a site for a receiving-house and out-patients' department. A motion to adopt the report was met by an amendment approving of the scheme with the exception of the clause reserving to the Infirmary a portion of the site. After a debate, the amendment was carried by 36 votes to 29. A second amendment was moved that the matter be adjourned *sine die.* A division showed 35 votes for and 35 against this second amendment. The Lord Mayor gave his casting vote against the proposal to adjourn the matter *sine die.* A resolution was then adopted referring it back to the Committee.

A fresh discovery of Roman-British remains has just been made in the county town of Dorchester, Dorset. During some excavations on a building estate on the confines of the borough, and only a few hundred yards from the ancient Roman amphitheatre, an excellent specimen of a villa pavement has been disclosed. Several similiar discoveries have been made of late years, but nothing so fine or so well preserved has yet been recorded. The pavement is about 2ft. below the surface, and the design is unusually elaborate, while the colouring of the tesseræ remains almost as fresh as when laid down. The discovery is regarded as of great importance, and the authorities of the British Museum are stated to be interesting themselves with the view to securing an almost unique specimen.

The wood of the red beech acquires, by the use of ordinary shellac polish, a dirty yellow colour, and by the use of white polish, prepared from bleached shellac, an unsightly grey-white colour. Therefore, where light colours are desired, only filtered shellac polish should be employed, and in order to impart some fire to the naturally dull colour of the beechwood the admixture of a solution of dragon's blood in alcohol for a red shade, or turmeric in alcohol for a yellow, may be used. A compound of the red and yellow liquids gives a nice orange shade. A few trials will soon show how much colouring matter may be added to the polish.

Acton Castle, Cornwall, about two miles from Marazion Station, is about to be transformed, like Tregenna Castle, St. Ives, into a large hotel. It was built about the year 1775 by John Stackhouse, an eminent botanist, who was born in 1741, and who succeeded to the Pendarves estates in Cornwall in 1763. He erected Acton Castle for the purpose of pursuing his researches in marine algæ, and in 1795-1801 he issued his important work on British seaweeds, of which a new edition appeared in 1816. Sir J. E. Smith commemorated the name of Stackhouse, who died in November, 1819, in the genus *Stackhousia.* The next owner of Acton Castle was Captain (afterwards Admiral) Bulkeley Mackworth Praed, who was here in 1832 when Samuel Tymms published the second volume of his "Family Topographer," and who died here in October, 1852. For many years Acton Castle has been the property of the Lanyon family. The castle is within a few yards of the beach, and commands a magnificent view of Mounts Bay.

The annual convention of the American Institute of Architects will be held in Pittsburgh, Pa., on November 13, 14, and 15 next. The papers to be read will be classed under several heads: relating to artistic subjects, to historical topics, and to construction. Under the first head there will be several papers on the influence of the French School of Design on Architecture in the United States. One or two papers are promised on architecture and the allied arts. Several papers are expected on the legitimate style of ornamental design for skeleton steel construction, as well as a few papers on historical topics. The Pittsburgh manufacturing plants such as the Carnegie steelworks, the Westinghouse electrical plants, and the plate-glass works will be thrown open to the architects for examination, and before this examination papers will be read describing the methods of manufacture, &c., of the different plants that will be visited.

First-class staining can (says the *Canadian Architect and Builder*) be done only with the best of materials. Water-stains are objectionable, in that they raise the grain of the wood, and yet their exceeding transparency, and the quality they possess of drying without showing laps, clouds, streaks, &c., enable the workman to obtain better results as a rule than oil and turpentine stains afford. Alcohol stains, in this respect, are ranked with water-stains. The successful stainer bears first in mind the fact that not only is colour effect sought, but the figure and characteristics of the wood are to be imitated or enriched. The really artistic example of staining is that which shows a tone of colour due to a combination of the colour of the wood and the stain employed. A good rule to remember when staining is this: The woody appearance is to be sought for, the painty look to be avoided. Nearly all woods have a transparent quality or power of reflection, changing as the changing light strikes them. The aim of the stainer should be to have the wood retain this reflecting property, this changing look as one changes his position or the daylight shifts. Only the best-dressed and smoothest lumber, clear and clean, knot and sap free, and running barren of soft places or "dead wood," invites the best order of staining.

St. Petersburg now boasts of a Pan-Russian Fire Protection Society, organised on lines not dissimilar from those of the British Fire Prevention Committee, although fire-brigade matters perhaps receive more attention there than with the English institution, which deals primarily with the prevention of fire from the constructive and technical point of view. The Russian society is, however, also now to follow the London example of creating a fire-testing station, and Prince Alexander Levoff, its president, has already gone so far as to present the necessary site and building. The scheme for this station is the result of a visit by Mr. E. O. Sachs to St. Petersburg last month, and its organisation is part of his project for a series of stations in the Continental capitals, to be worked on lines identical with those adopted in London; but whilst the foreign stations will attend solely to matters of local interest, the station at Regent's Park will deal with matters of international importance, and serve as the centre. At St. Petersburg, for instance, attention will almost entirely have to be given to improved methods of construction in the villages, where safer materials will have to take the place of thatch and matching, &c., a subject which would, of course, be of no moment elsewhere. The annual destruction of villages in Russia is very serious, and the national yearly fire loss, according to Mr. Sachs, is about seven millions sterling. Mr. Sachs expects that by a systematic organisation of this kind, and a systematic international mode of procedure, with due regard to special local requirements, combined action in fire-prevention will be arrived at on the same lines as we have international movements in sanitary and hygienic matters which, though they have one recognised centre (in the case of fire prevention this will be in London), yet allow independent treatment of purely local questions in the particular countries to which they refer.

THE ARCHITECTURAL ASSOCIATION.
The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, and the STUDIO OPENS on TUESDAY, October 10th, at 6.30 p.m.
A Pamphlet, giving full information, and nomination forms for Membership, may be obtained on application to the SECRETARY, 56, Great Marlborough-street, W.
G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

The Society of Architects.
Founded 1884. Incorporated 1893.
ST. JAMES'S HALL, PICCADILLY, W.
An EXAMINATION in ARCHITECTURE and BUILDING CONSTRUCTION, &c., will be held on the 11th, 12th, and 13th of OCTOBER, 1899.
Gold, Silver, and Bronze Medals are awarded under certain conditions.
The latest date for entering is SEPTEMBER 20th, 1899.
Syllabus free. · Copies of last Examination Papers, 1s.
C. McARTHUR BUTLER, Secretary.

Trade News.

WAGES MOVEMENTS.

Leeds Bricklayers' Dispute.—An adjourned meeting of the Leeds Master Builders' Association was held on Monday, at the Builders' Exchange, Mr. W. H. Dews, president, occupying the chair, to consider further replies from members to the circular inviting an expression of their views as to the proposed advance of ½d. per hour in the wages of the London Order of Bricklayers. The complete returns show that 79 members were opposed to the concession of any advance at present, and that eight only are in favour of paying the additional ½d. The vote represents practically exclusively the views of the masters who employ bricklayers. The result will be communicated to the Executive of the Yorkshire Federation in due course. The Leeds master builders do not propose to hold any further meeting before the ordinary meeting of their association in October.

Manchester.—A meeting of employers in the allied building trades was held on Tuesday in Manchester, under the presidency of Mr. C. W. Green, of Liverpool, when an advance was made towards a settlement of the dispute in the local plastering trade, which has lasted 27 weeks. When the national dispute was settled in June, the Manchester employés declined to go to work again except at the advance in wages of 1d. per hour. The employers offered ½d. advance forthwith, and another at the end of twelve months, but this the men would not accept, and a deadlock ensued. At Tuesday's meeting, however, the men wrote offering to take the second advance at the expiration of six months. This offer was accepted by the masters at a conference with the men held yesterday (Thursday).

CHIPS.

At St. Peter's Church, Newbold, a new stained-glass window by Messrs. Comere and J. Capponnier, of Brussels, was dedicated on Saturday afternoon last. The subject, "The Widow's Mite," is depicted in the same style as the other five windows in the church by the same artists.

After attending the opening of the fine county educational institution at Truro, of which he is the founder, Mr. J. Passmore Edwards will, on the 26th of October, open the new library and institute which he has presented to Launceston. About the middle of that month Mr. Herbert Gladstone will open the library which Mr. Passmore Edwards is giving to the borough of East Ham, where it is his intention to build a large hospital. All these buildings have been designed by Mr. Silvanus Trevail, F.R.I.B.A., of Truro.

An inquiry was conducted at the board schools, Wivenhoe, on August 24 by Mr. W. A. Ducat, on behalf of the Local Government Board, with reference to an application of the council for sanction to a loan of £5,450, for purposes of water supply for the district. The scheme, which has been prepared by Messrs. Sands and Walker, civil engineers, Nottingham, was explained to the inspector by Mr. H. H. Sands, C.E. It is proposed to sink a borehole through the London clay into chalk, the water to be then pumped into an iron water tank erected on top of an ornamental water tower to give a good pressure to the higher parts of the district. There was no opposition.

The sole executrix of the will, which bears date October 18, 1879, of Professor Banister Fletcher, of Anglebay, Woodchurch-road, West Hampstead, and of 29, New Bridge-street, architect and surveyor, Professor of Architecture at King's College, late surveyor to the Board of Trade, who died on July 5 last, aged 66, is his widow, Mrs. Eliza Jane Fletcher, by whom the testator's estate has been valued at £75,813 15s. 5d. gross, including personalty of the net value of £39,165 14s. 8d. The late Professor Fletcher left all his property to his wife absolutely.

LIST OF COMPETITIONS OPEN.

Northfleet—Schools (750)	15gs.	Fredk. Mitchell, Clerk, 49, Windmill-street, Gravesend	Sept. 4
Dumfries—Public Library		John Grierson, Town Clerk, Dumfries	„ 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	„ 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	„ 16
Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	„ 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 30
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	Oct. 17
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Parsonstown—Water Supply (6,000 population)		H. Barlow, Clerk, Town Hall, Parsonstown	—
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—

LIST OF TENDERS OPEN.

BUILDINGS.

Loughborough—Two Houses, Park-road	J. Bennet and T. A. Hubbard	Albert E. King, Architect, Baxter Gate, Loughborough, Leicester	Sept. 2
Cowling, Yorks—Stores	Beehive Co-operative Society	James Hartley, Architect, Skipton	„ 2
Levenshulme—Stores Shed	Urban District Council	J. Jepson, Surveyor, Guardian Chmbrs., 8A, Tiviot-dale, Stockport	„ 2
Rannagulzion, N.B.—Additions to Farm Steading at Burnside		L. and J. Falconer, Architects, Blairgowrie	„ 2
Selby—Pointing, &c., Waterworks Tower and Chimney	Urban District Council	Bruce McG. Gray, A.M.I.C.E., Town Hall, Selby	„ 2
Leeds—Dwelling-House at Meadow-lane Gasworks	Gas Committee	R. H. Townsley, General Manager, Municipal Buildings, Leeds	„ 2
Cullen, N.B.—Additions to Town Hall		The Borough Surveyor's Office, Cullen	„ [illegible]
Chapeltown—School at Warren	Ecclesfield School Board	G. A. Wilson, Architect, Hartshead Chambers, Sheffield	„ 2
Bolton—Alterations to Astley Bridge Public Offices	Library Committee	The Borough Surveyor's Office, Town Hall, Bolton	„ 2
Dundee—Power Station	Town Council	William Alexander, City Architect, Dundee	„ 2
Batley—Four Houses at Shaw Cross		John H. Brearley, Architect, Hanover-street, Batley	„ 4
Falkirk—Tenements, Main-street, Camelon	Heritable Property Co., Ltd.	John P. Goodsir, Architect, Newmarket-street, Falkirk	„ 4
Brandon—Alterations to Premises at Meadowfield	Brandon and Byshottles Co-op. Soc.	Wm. Perkins, M.S.A., Architect, Bishop Auckland	„ 4
Sowerby Bridge—Two Warehouses at Calder Oilcloth Works		Jackson and Fox, Architects, 7, Rawson-street, Halifax	„ 4
Hellingly, Sussex—Foundation Works for Asylum	Visiting Committee	G. T. Hine, F.R.I.B.A., 35, Parliament-street, Westminster, S.W.	„ 4
Orton—Office Houses at Sheriffmuir		Henry Hamilton, St. Mary's Cottage, Orton, Scotland	„ 4
Padiham—Technical Institute	Urban District Council	Henry Ross, Architect, Cannon-street, Accrington	„ 4
Whitehaven—Pavilion in Playground		A. Huddart, Architect, 22, Lowther-street, Whitehaven	„ 4
Belfast—Warehouse and Manufactory, Eliza-street	Wheeler and Co., Ltd.	J. J. Phillips and Son, Architects, 61, Royal-avenue, Belfast	„ 4
Leeds—Entrance to Judges' Lodgings, Hyde-terrace		The City Engineer's Office, Municipal Buildings, Leeds	„ 5
Enfield—Schools, Chase Side	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	„ 5
Colchester—Alterations to Brickhouse Farm, Ipswich-road	Corporation	Herbert Goodyear, A.M.I.C.E., Borough Engineer, Colchester	„ 6
Sandgate, Kent—Wesleyan Church and Schools		Gordon, Lowther, & Gunton, Architects, Bloomfield-street, E.C.	„ 6
Penistone—House, &c., at Stottercliffe Cemetery	Burial Board	G. A. Wilde, Architect, Bank-street, Sheffield	„ 6
Cwmdare—House and Surgery		T. Roderick, Architect, Clifton-street, Aberdare	„ 6
Ealing—Extension of Coverings at Ealing Station	Great Western Railway Co.	The Engineer, Paddington Station, London	„ 6
Sowerby Bridge—Baptist Sunday-School & Alteration of Chapel		Sutcliffe and Sutcliffe, A.R.I.B.A., Albert-street, Hebden Bridge	„ 6
Cwmaman—Eleven Houses	Mount Pleasant Building Club	J. Llewellin Smith, Architect, Aberdare	„ 6
Huddersfield—Drill Hall	2nd V.B. W.R. Regiment	W. Cooper, Architect, 6, Kirkgate Buildings, Huddersfield	„ 6
Gwaun-cae-Gurwen—Ventilating, Repairing, &c., Carmel Chapel		The Architect's Office, 63, Wind-street, Swansea	„ 6
Mallow—Repairs to Cottages, &c.	Rural District Council	Maurice Regan, Clerk, Workhouse, Mallow	„ 6
Westbury-on-Severn—Repairing Tower and Spire of Church		The Rev. L. Wilkinson, Vicarage, Westbury-on-Severn, Gl'stershire	„ 6
Bishop Auckland—Remodelling Property at Fylands Bridge	J. W. Page Page	F. H. Livesay, Architect, Newgate-street, Bishop Auckland	„ 6
Westbury—Passenger Station, Goods Sheds, &c.	Great Western Railway Co.	The Engineer, Bristol Station	„ 6
Ballycrovane—Coastguard Station		The Carpenter-in-Charge, Queen's College, Cork	„ 7
Ipswich—Additions to Fire Brigade Station, Waterworks-street	Waterworks Committee	The Engineer, Waterworks Offices, Waterworks-street, Ipswich	„ 7
Devonport—Buildings for Working Classes	Town Council	John F. Burns, Borough Surveyor, 30, Ker-street, Devonport	„ 7
Cork—Repairing Carrignavar Dispensary	Union Guardians	John Cotter, Clerk, Board Room, Workhouse, Cork	„ 7
Baildon—Villa, Stable, and Coach-house		J. Robertshaw and Sons, Architects, 55, Tyrrel-street, Bradford	„ 7
Edinburgh—Flora Stevenson Public School, Comely Bank	School Board	Robert Wilson, Architect, 3, Queen-street, Edinburgh	„ 7
Bradford—Thirty-Three Houses, Folkestone-street	Provident Industrial Society, Ltd.	Rycroft and Firth, Architects, Manchester-road, Bradford	„ 7
Glasgow—Public Halls at Springburn	Corporation	John Lindsay, Interim Clerk, City Chambers, Glasgow	„ 7
Barnstaple—Rebuilding Premises, Castle-street	Bentley and Co.	Arnold Thorne, Architect, Barnstaple	„ 7
Darwen—Post Office		J. B. Thornley, Architect, Darwen	„ 8
Sheffield—Twenty Cottages, Hands-lane, Common-side	Health Committee	Charles F. Wike, City Surveyor, Town Hall, Sheffield	„ 8
Illogan—Disinfecting Apparatus Building at West Tolgus		Thurstan C. Peter, Town Hall, Redruth	„ 8
Stronachlachar, Loch Katrine—Reconstructing Invergyle House	Glasgow Corporation	James M. Gale, Engineer, City Chambers, 45, John-street	„ 9
Brinscall, Lancs—Store and Two Houses, School-lane	Withnell Co-operative Society	John B. Thornley, Architect, Market-street, Darwen	„ 9
Parkgate—Nineteen Dwelling-Houses, Netherfield-lane	F. Mason	J. Platts, Architect, Old Bank Buildings, High-street, Rotherham	„ 9
Gorey, Ireland—Additions to Workhouse	Guardians	R. Creighton, Clerk, Board Room, Gorey, Ireland	„ 9
Botriphnie, N.B.—Free Church Manse		R. B. Pratt, A.R.I.B.A., County Bank House, Elgin	„ 11
Bakewell—Infirmary	Guardians	E. M. Longdon, Architect, Town Hall, Bakewell	„ 11
Cork—Additions to Fermoy House		W. H. Hill and Son, Architects, 28, South Mall, Cork	„ 11
Kendal—Shop, Warehouses, &c., at Endmoor	Co-Operative Society, Ltd.	John Stalker, M.S.A., Architect, 57, Highgate, Kendal	„ 12
Bromley—Additional Accommodation at Asylum, Devon's-rd.	Poplar & Stepney Asylum Managers	J. and S. F. Clarkson, Architect, 136, High-street, Poplar, E.	„ 12
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	„ 12
Bradford—Reflooring and Roofing Shed, Canal-road		Milnes and France, Architects, Bradford	„ 12
Selly Oak—Casual Wards in Workhouse Grounds	King's Norton Union Guardians	C. Whitwell and Son, Architects, 23, Temple-row, Birmingham	„ 13
Bermondsey, S.E.—Alterations to Town Hall	Vestry	The Surveyor, Town Hall, Bermondsey	„ 13
Dukinfield—Offices, &c., at Disposal Works	Joint Sewerage Board	J. Newton, Son, and Bayley, Engineers, 17, Cooper-st., Manchester	„ 13
Bures St. Mary, Suffolk—Kiln		G. H. Page, F.I.A.S., Architect, Trinity Chambers, Colchester	„ 14
Hurstpierpoint, Sussex—Cemetery Works	Parish Council	H. W. Beach, Perrymount-road, Hayward's Heath	„ 14
Thornbury—Infirmary at Workhouse	Guardians	G. H. Oatley, Architect, Baldwin-street, Bristol	„ 15
Carlisle—New Vicarage, Irthington		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	„ 18
Bradford—Enlarging Tyersal School	School Board	E. P. Peterson, F.S.A., Architect, 48, Sunbridge-road, Bradford	„ 18
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	„ 18
Littlestones, Kent—Coastguard Buildings	Admiralty	The Coastguard Station, Littlestones, Kent	„ 19
Long Melford—Fireproof Strong Room		Fisher and Steed, Solicitors, Long Melford, Suffolk	„ 20
Paddington, W.—Alterations to Woodfield House, Woodfield-rd.	Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	„ 27
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	„ 30
Tooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	Oct. 11
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	„ 12
Cumberland—Cutting Foundations at Clifton Colliery		J. Gilchrist, Clifton Lodge, near Workington	—
Senghenith—Business Premises, Commercial-square	J. Jones and J. Morgan	E. H. Bruton, F.R.I.B.A., Architect, 15, Queen-street, Cardiff	—
Widdrington—Alterations to Co-operative Society's Premises		James Haigh, Widdrington Colliery Office, Widdrington	—
Essington—Artisan's Dwellings		John Weller and Sons, Architects, Wolverhampton	—
Thornton Heath—Chapel, Parchmore-road	Wesleyan Chapel Trustees	Frederick W. Ledger, Architect, 8, Philpot-lane, E.C.	—

BUILDINGS—*continued.*

Leeds—Taking Down Part of 88 and 90, North-street		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Romiley—Alterations to Grey Horse Inn		Burton and Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Whaley Bridge—Eight Houses	Co-operative Society	C. W. Johnson, Architect, Whaley Bridge	—
Flookburgh—Shop and House		J. Slater, Flookburgh, Lancs	—
Tunbridge Wells—House		J. F. Bull, Surveyor, 30, Bedford Row, London, W.C.	—
Maidstone—Mills	W. J. Mackey	Hubert Bensted, Architect, Maidstone	—
Grays, Essex—Alterations to Co-operative Stores		Christopher M. Shiner, A.R.I.B.A., 3, Bond-court, Walbrook, E.C.	—
Dewsbury—Rebuilding Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Littleborough—New Works	Phœnix Ironworks Co.	F. H. Shuttleworth, Archirect, Littleborough	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Selby—Alteration of Premises	Yorkshire Banking Co., Ltd.	James Young and Co., Architects, 62, Market-street, Bradford	—
Leeds—Alterations to General Infirmary		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Dewsbury—Restoration of Schools	School Board	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
New Tupton—Church Institute, Sunday-School, and House		Ernest Oxley, M.S.A., Architect, Clay Cross	—
Chepstow—Rebuilding 29, High-street	C. Curtis	W. Robinson, Architect, King-street, Hereford	—
Tooting, S.W.—Flats		J. Theobald, Architect, 26, Budge-row, Cannon-street, E C.	—
Morecambe—Altering House into Business Premises	Lancaster and Skerton Co-op. Soc.	Marshall Bros., Architect, Back-crescent, Morecambe	—
East Kirkby—Extension to Co-operative Premises		Lawrence Bright, Architect, 9, St. Peter's Church-walk, Nottingham	—
Cainscross—Extensions to Bakehouse	Cainscross and Ebley Co.-op. Soc.	The Society's Office, Cainscross, Glos.	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Great Bentley—Four Cottages at Holly Bush Hill Brickworks	J. Girling	J. W. Start, F.S.I., Architect, Colchester	—
Bradford—Six Houses and Shop		James Young and Co., Architects, 62, Market-street, Bradford	—
Nottingham—Additions to Workhouse, Beech-avenue		A. H. Goodall, Architect, 14, Market-street, Nottingham	—
Watford—New Offices and Warehouse	Benskin's Watford Brewery, Ltd.	Chas. P. Ayres, Architect, 14A, High-street, Watford	—
Bradford—Offices, &c., at Globe Foundry, Whetley Hill		F. Moore, Architect, 40, Sunbridge-road, Bradford	—
Tuxford—Fifteen Houses		Flockton, Gibbs, and Flockton, 15, St. James's-row, Sheffield	—
Killinghall—Cottage	Miss Powell	Bland and Bown, Architects, North Park-road, Harrogate	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Usworth, Durham—Forty Houses, Douglas-terrace		Little and Browne, Architects, Mossley-street, Newcastle	—
Consett—Two Engine Houses	Consett Iron Company, Ltd.	The Engineer's Office, Consett, Durham	—
Bramley—Two Shops and Nine Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Stalybridge—Branch Bank		John Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	—
Fornham, Suffolk—Kiln and Malt Store at Malting	Lady Cullum's Trustees	Ernest Pritchett, Hardwick Estate Office, Bury St. Edmunds	—
Wallsend—Branch Premises		The Industrial Co-operative Society, Ltd., Wallsend	—
Tunbridge Wells—Parish Room and Institute, St. John's		H. H. & E. Cronk, Archts., Mount Ephraim-rd., Tunbridge Wells	—
Chesterfield—Offices	Brampton Brewery Co., Ltd.	J. P. Earle, Architect, Norfolk-row, Sheffield	—
Norfolk—Additions to West Winch National School		Arthur J. Lacey, Architect, 6, Upper King-street, Norwich	—
Irthington—Vicarage		T. Taylor Scott, F.R.I.B.A., Architect, 43, Lowther-street, Carlisle	—
Cullingworth—Stable, Cart Shed, &c.	Bingley Urban District Council	H. Bottomley, Surveyor, Town Hall, Bingley	—
Tottenham, N.—Sixty Houses, Bruce-grove		R. J. Adams, Architect, 55, Leighton-road, Kentish Town, N.W.	—
Bramley—Thirty-Four Cottages		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Leeds—Thirteen Through Houses on Ivy House Estate	Wm. Byrom	J. W. Thackray, A.S.I., Architect, 14, Infirmary-street, Leeds	—
Bare—Two Houses and Stables		A. Anderson, Lodge-street, Bare, Morecambe	—
Londonderry—Methodist Church, Carlisle-road, Derry		Alfred A. Forman, Architect, 5, Castle-street, Londonderry	—
Kidderminster—Additions to Dye-House, Mill-street	Edward Hughes and Sons	Gething and Son, Architects, Oxford Chambers, Kidderminster	—
Bramley—Thirty-Six Cottages		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Morecambe—Bank Premises	Bank of Liverpool, Ltd.	Cressey & Keighley, Archts., Bank Chmbrs, Euston-rd., Morecambe	—

ENGINEERING.

Killeens, Cork—Waterworks	District Council	John Cotter, Clerk, Board Room, Workhouse, Cork	Sept. 2
Newcastle-on-Tyne—Two Lightning-Conductors on Moot Hall		J. Cresswell, County Architect, Moot Hall, Newcastle-on-Tyne	" 2
Carmarthen—Reservoir (17,000,000gal.)	Corporation	The Borough Surveyor, Carmarthen	" 2
Birmingham—Three Superheaters to the Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 2
London, E.C.—Compressed Air Receivers	Trinity House Corporation	The Secretary, Trinity House, London, E.C.	" 4
Halifax—Fire-Escape Staircases, &c., Workhouse, Gibbet-lane		W. Clement Williams, Architect, 29, Southgate, Halifax	" 4
Belfast—Widening Spencer Dock Entrance	Harbour Commissioners	G. F. L. Giles, Engineer, Harbour Office, Belfast	" 4
Heysham—Laying Cast-Iron Water Mains (8,730 yards)	Urban District Council	Wm. Atkinson, Surveyor, Council Offices, Heysham	" 4
Clevedon—Widening Bridges on Ken and Strode Roads	Urban District Council	G. W. Knowles, A.M.I.C.E., St. John's-road, Clevedon	" 5
Portsmouth—Repairing Camber Graving Dock Entrance		The Borough Engineer's Offices, Town Hall, Portsmouth	" 5
India Office, S.W.—Locomotives (Metre Gauge)	Secretary of State for India	The Director-General of Stores, India Office, Whitehall, S.W.	" 5
Belfast—Washing and Disinfecting Machinery	Guardians	Joseph W. Robb, Assistant Clerk, Workhouse, Belfast	" 5
Truro—Cast-Iron Water Mains (8 miles)	Rural District Council	R. Hansford Worth, A.M.I.C.E., Engnr., 42, George-st., Plymouth	" 5
Clacton-on-Sea—Laying Gas and Water Mains (520 yards)	Urban District Council	Sidney Francis, Gas & Water Offices, Rosemary-rd., Clacton-on-Sea	" 6
Waterloo, Lancs—Laying Tramway Track	Urban District Council	F. Spencer Yates, A.M.I.C.E., Surveyor, Town Hall, Waterloo	" 6
Pontypridd—Laying Main (3½ miles)	Waterworks Co.	The Manager's Office, 28, Gelliwastad-road, Pontypridd	" 6
Mallow—Sinking Two Wells	Rural District Council	M. Regan, Clerk, Workhouse, Mallow	" 6
Colchester—Widening Salary Brook Bridge	Corporation	Herbert Goodyear, A.M.I.C.E., Borough Engineer, Colchester	" 6
Poplar—Engineering Works	Guardians	F. J. Warden-Stevens, Engineer, 31, Victoria-street, S.W.	" 6
Belfast—Laying Cast-Iron Pipes	City & District Water Commssnrs	The Water Office, Belfast	" 7
Glasgow—Heating and Ventilating Public Halls, Springburn	Corporation	J. Lindsay, Interim Clerk, City Chambers, Glasgow	" 7
Belfast—Laying Knockbracken Main (2 miles 19 chains)	City & District Water Commssnrs	Acheson Ferguson, Quantity Surveyor, 2, Wellington-place, Belfast	" 7
East Ham—Electric Light and Traction Plant	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	" 9
Keighley—Three Filtration Tanks	Rural District Council	Barber Hopkinson & Co., Engrs., Craven Bank Chambers, Keighley	" 9
East Ham—Water-Tube Boilers, Condensers, Purifiers, &c.	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	" 9
Airdrie—Store Reservoir on Cowgill Burn	Airdrie and Coatbridge Water Co.	M'Creaths and Stevenson, C. and M.E., 208, St. Vincent-st., Glasgow	" 9
East Ham—Electric-Lighting Cable	Urban District Council	W. C. Ullman, M.I.E.E., The Limes, White Post-lane, East Ham	" 9
Fairlie, N.B.—Waterworks	Ayrshire County Council	Campbell Hart, C.E., 32, John Finnie-street, Kilmarnock	" 11
Preston—Bridge over River Darwen	Lancashire County Council	W. Harold Radford, Bridgemaster, County Offices, Preston	" 11
Carlisle—Extension of Steam Pipes, &c.	Corporation	Prof. Alex. B. W. Kennedy, 11, Victoria-street, Westminster	" 11
St. Anne's-on-Sea—Electric-Lighting Plant	Urban District Council	P. J. S. Tiddeman, Eng., St. Andrew's-rd. South, St. Anne's-on-Sea	" 11
London, E.C.—Locomotives and Tenders	Bengal and North-Western Ry. Co.	E. L. Marryatt, 237, Gresham House, Old Broad-street, E.C.	" 11
Hackney—Dynamos	Vestry	Robert Hammond, M.I.C.E., 64, Victoria-street, Westminster	" 12
London, E.C.—Bridgework	Bengal Nagpur Railway Co., Ltd.	The Company's Office, 132, Gresham House, Old Broad-street, E.C.	" 12
Bournemouth—Lancashire Boiler	Town Council	F. W. Lacey, Borough Engineer, Bournemouth	" 12
Southport—Tramways	Corporation	R. P. Hirst, Borough Engineer, Southport	" 12
Redcar—Road Bridges, &c.	North-Eastern Railway Co.	W. J. Cudworth, Engineer, Darlington	" 13
Woodford to Ilford—Railway	Great Eastern Railway Co.	The Engineer, Liverpool-street Station, London, E.C.	" 13
Leyton—Pumps, &c.	Urban District Council	F. Harman Lewis, Engineer, Cathall-road, Leytonstone	" 14
Grays—Refuse Destructor	Grays Thurrock U.D.C.	Arthur C. James, A.M.I.C.E., Grays	" 14
Southborough—Sinking Well	Urban District Council	George and Frederic W. Hodson, Engineers, Loughborough	" 14
Birmingham—Service Reservoir and Laying Pipes	Corporation	James Mansergh, Engineer, 5, Victoria-street, Westminster	" 14
Leyton—Overhead Travelling Cranes (8-ton and ½-ton)	Urban District Council	F. Harman Lewis, Engineer, Cathall-road, Leytonstone	" 14
Cairo—Mortar Mills and Fire Pumps	Public Works Department	The Commercial Department of the Foreign Office, Whitehall, S.W.	" 15
Hornsey, N.—Widening Bridge over New River, Turnpike-lane	Urban District Council	E. J. Lovegrove, Engineer, Southwood-lane, Highgate, N.	" 18
Maldon—Waterworks	Rural District Council	H. G. Keywood, C.E., M.S.I., Engr., 6, Market Hill, Maldon	" 18
Fareham—Air Tubes and Automatic Pump Ventilators		W. J. Taylor, County Surveyor, The Castle, Winchester	" 18
Pembury—Filter Beds, &c., at Waterworks	Corporation	The Borough Surveyor, Town Hall, Tunbridge Wells	" 20
Heckmondwike—Electric-Lighting Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen Street-place, London, E.C.	" 20
Southampton Docks Station & Portswood—Tramways (2¾ miles)	Corporation	The Borough Engineer's Office, Southampton	" 21
Ilfracombe—Electric-Lighting Plant	Urban District Council	W. H. Trentham, Engineer, 39, Victoria-street, Westminster, S.W.	" 25
Guildford—Reconstructing Wisley Bridge	Rural District Council	Nicholson Lailey, A.M.I.C.E., 16, Great George-street, Westminster	" 25
Tiflis—Tramways	Town Council	The Managing Dept., Town Council, Tiflis, Transcaucasus	Oct. 14
Luton—Electric Lighting Plant	Town Council	Albion T. Snell, Engineer, Suffolk House, Cannon-street, E.C.	" 22
Barking—Light Railway Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen-street-place, London, E.C.	" 24
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	Nov. 8
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Office of the Crown Agents, London	Jan. 4
Blackpool—Electric Fittings at Masonic Hall, Adelaide-street		T. Sankey, 93, Adelaide-street, Blackpool	—
Durham—Sinking Two Shafts near Seaham Harbour		The Colliery Offices, Durham	—
Arklow—Swivel Bridge at North Quay	Harbour Commissioners	J. Doyle, Harbour Master, Arklow, Ireland	—
Borrowdale—Bridge at Longthwaite		Thomas Wren, Longthwaite, Borrowdale	—

FURNITURE AND FITTINGS.

Billericay—Furniture, &c., for New Infirmary	Guardians	J. Needham, Master, Union House, Billericay	Sept.
Douglas—Furniture and Fittings, Municipal Buildings	Corporation	Ardron and Dawson, 6, Old Queen-street, S.W.	" 1
Ennistymon—Iron Bedsteads and Wire Mattresses (20)	Guardians	John O'Loughlin, Clerk, Workhouse, Ennistymon, Ireland	" 2
Denbigh—Locks for New Buildings and Old Asylum	Visiting Committee	Wm. Barker, Clerk to Committee, Denbigh	"

FENCING AND WALLS.

Falmouth—Granite Retaining-Wall near Tehidy-terrace	Urban Sanitary Authority	The Borough Surveyor, Municipal Buildings, Falmouth	Sept.
Leeds—Cast-Iron Gates at Judges' Lodgings, Hyde-terrace		The City Engineer's Office, Municipal Buildings, Leeds	"
Clevedon—Iron Fencing and Coping on Beach	Urban District Council	G. W. Knowles, A.M.I.C.E., St. John's-road, Clevedon	"

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COMPLETENESS.

IN his "Stones of Venice," Mr. Ruskin has well said: "The modern English mind has this much in common with that of the Greek, that it intensely desires in all things the utmost completion or perfection compatible with their nature. This is a noble character in the abstract, but becomes ignoble when it causes us to forget the relative dignities of that nature itself, and to prefer the perfectness of the lower nature to the imperfection of the higher." Again, he says we are "not to set the meaner thing, in its narrow accomplishments, above the nobler thing in its mighty progress; not to esteem smooth minuteness above shattered majesty." This thought is forced upon us when we see so much in our architecture that is conceived and carried into effect in the manner here called ignoble—an immense amount of tedious and thoughtless labour lavished on small detail without any advantage or purpose. Architecture is not alone: every art can show its "animated tools." We see it in our picture galleries and academies, in our industrial exhibitions, and our schools of science and art. It is mistaken for "finish," but finish implies precision and completeness.

Finish is an important quality in all art; in painting it distinguishes the composition and execution of the master from that of the mere tyro; no matter how varied the style of the painter, whether it is a work of Joshua Reynolds or of Constable, of Watts or of Turner, of Alma Tadema, or of Holman Hunt, each has a particular kind of finish. By this word we do not mean mere fineness, smoothness, or minuteness of parts, but the sense of completeness of expression—of perfection. If in this sense we apply the term to painting, it is at once seen that it is not specially intended to distinguish fine or minute execution, and that the term is equally to be used when we speak of the works of Watts or of Turner as to those of Turner or Alma Tadema. As one writer has said, "All that tends to completeness of expression tends towards true finish; all that obscures or mars this completeness must be regarded as making the work in which it appears unfinished." Sir Joshua Reynolds, in his "Discourses," observes: "Of these painters whom we consider as patterns, we shall find that their great fame does not proceed from their works being more highly finished than those of other artists, or from a more minute attention to details, but from that enlarged comprehension which sees the *whole at once*, and that energy of art which gives it characteristic effect by adequate expression." The same great master, speaking of a landscape painter who endeavoured to represent every individual leaf on a tree, says: "I am sure that an artist who looked only at the general character of the species, the order of the branches, and the masses of the foliage, would in a few minutes produce a more true resemblance of trees than this painter in as many months." Everyone who has any feeling for art is quite satisfied with this reasoning, and he looks with mingled pity and contempt on the painter who tries to delineate everything on his canvas by a multitude of laborious touches which do not count for anything in the general effect. Such a picture has really never been begun, and certainly can never be finished in a true sense. The artist who designs his work with a minute attention to details can never have comprehended his subject in a right sense, because he fails to see the whole at one glance.

And there are architects who in the same way somehow confuse the issues of their work; they begin by devoting a great deal of attention to some details, but always fail to complete them in a true sense. Instead of arranging their general scheme or plan with some degree of completeness, they set their minds on a particular elevation, studying to produce or imitate a model which they have taken a fancy for, before they have made the necessary preparation in the plan. Those gables or that tower must have a certain effect; the details of a large bay are drawn with minute care to imitate as nearly as possible some old or admired work, and all this labour is expended without that corresponding regard to a careful arrangement. A man who begins his elevation with every dentil and joint, who draws assiduously his carved ornament, and finishes his doors and windows with their bars and ironmongery even to the door-knocker is the artist who fails to grasp the true meaning of design, and who never really finishes his work. He, in short, is like many painters who, while depicting something beautiful in itself, are led to spend considerable time and to lavish much care on the details and accessories of the background or environment. Even Millais gives us a beautiful child just awaking from her sleep; but not content with this dominant motive, he labours to produce a polished brass bedstead and a richly-patterned bedquilt—a kind of realism that appeals to the popular taste for what is mistaken as "high finish," but which detail tends to impair and obscure the real motive.

In fact, this camera-like exactness of reproduction is one of the weaknesses of the popular painter and architect; we might observe the same faults in such consummate technical productions of landscape and Classic interiors as Mr. Leader and Sir Alma Tadema give us, though their harmonies of colour and light save them. The architect falls into the same error as the painter. Instead of modelling his design on plan, he gives us a laboured patchwork of styles and details, joints of brickwork and rusticated masonry, and think these make finish. With him finish is mistaken for a quantity of detail on a laboured execution, and neatness quite out of proportion to the thought he has bestowed on his plan or elevation. A little bit of carving or low-relief ornament to terminate a stringcourse, or to give point to a doorway, is worth yards of distributed decoration all over a façade.

This quality of finish should also be seen in the interior. Modern architecture of the ordinary kind concerns itself chiefly with the exterior, and one of the chief reasons why our buildings lack finish in the true sense. In the best periods of architecture, the interior received the largest amount of decoration. If they could not afford to finish a church with sculpture or carving throughout, it was sparingly introduced into a few of the most conspicuous parts;—it was never common or cheap, and spread over everything. On a great cathedral west front, the sculpture was confined to the deep-membered cavernous portal with its storied niches of figures; the other parts went without. The most finished structure the world has ever seen was probably the Parthenon. Comparatively plain and massive without, its external sculpture only faintly expressed the beauty and finish of the cella; look, too, at the *finesse* and grace of the most polished and refined style that France has ever produced, that of Louis XVI., as embodied in such buildings as the Palace of the Elysée, the Petit Trianon, Versailles, and the superb decorations at that Palace by Le Brun and others. It is to the interiors of these buildings we turn for the consummation of the art. But in our modern buildings there is a great want of harmony between the exterior and interior. Directly we enter the building, whether it be a town hall or a modern villa, there is a poor or meagre look—no sense of proportion between the decoration and detail of the outside and inside. The reason why the exterior receives all the labour is mainly commercial; the owner has so much to spend, and he likes to make a display; the architect desires to give an air of "finish" to his exterior;—both do it from a motive of profit, and in this way are emulating the painter who finds that minute finish and detailed accessories captivate the ordinary picture buyer; but these motives have destroyed all sense of completeness. The building so treated is really unfinished, for the artist's attention has been bestowed on one part to the exclusion of the other. Such superficial detail still passes for finish; it is so much easier to plaster over a building with all kinds of ornament than to design or select a piece to accentuate a point or express a motive. A richly-carved entrance of stone is a mere mockery when inside one sees bare jambs and a square head. Equally a make-believe of finish is an elaborate window-dressing to a window which is a meagre sash-frame with its jamb linings and head. There are plenty of these juggleries in modern architectural work, all done to give an air of finish when there is really none; to show an immense amount of labour in minute detail, which is admired by the thoughtless, and mistaken for good art. Yet completeness implies a harmonious relation of the arts.

Without the aid of the decorative arts of painting and sculpture a building of any pretensions does not satisfy; it is too abstract to satisfy the artistic mind by itself. A truly finished or completed building ought to possess these aids to its expression. A direct appeal to motive is required to give the abstract lines of architecture, or true meaning. The alliance between these arts must be intimate. The sculpture and carving must be cut in the solid masonry; it should be part of capital, cornice, and wall, partaking of the functions of each; the painted decoration should not be easel pictures, but done on the wall surfaces and treated with breadth, and the subjects conceived decoratively. The modern idea of finish in art is to bring in these decorative arts as rivals rather than as accessories to the architect's work. The carver, decorator, painter, glass-painter, inlayer, keramist, are each invited to do their best or their worst. There is no alliance, no coherence. The so-called "finished" building is crowded with all kinds of tesselated pavements, mosaics, stained glass, carving, and the rest. Nor is finish to be obtained by the introduction of all sorts of architectural conventions, such as those used by the Gothic Revivalist. His idea was to cover his walls with geometrical ornament, blank traceries and arcadings, intricate cusped panels; to finish his stone and woodwork with chamfers continuous and stopped, notchings and scallopings, dog-teeth; to fill his windows with stained glass and subjects that served very well as samples in a glass-stainer's studio or museum, but had no reference to the building or locality. This sort of decoration was called finish, but it left a sense of incompleteness—no idea or expression was conveyed by them. The modern carver in stone or wood, the "artist" in stained glass, metal, and woodwork, and keramics, the "art decorator" and manufacturer, all begin their respective work after the architect has done his part, each independently of the other, and the result is a conflict of differing ideas and principles. How can there be any harmonious relation? There is finish but no completeness, because each speaks a separate language.

Then, lastly, there is a mode or manner of finish which we have no adequate word to express, but which is better rendered by the French phrase *netteté d'exécution*—a natural daintiness of hand. There is much that is coarse and crude in our buildings and their details: they seem to have been executed by craftsmen who have no sympathy with the design; who muddle mouldings, produce a conglomeration of fillets for refined and well-related members, who mistake contours and textures of materials, smooth off every appearance of tool mark, where the tooled hand-worked surface would be infinitely more expressive and meaning, and betray a roughness and clumsiness where one looks for real finish. But this kind of execution cannot be mistaken for that "smooth minuteness" of which we have spoken—it is never mechanical. All this and much more we may learn by a careful study of art in its best periods, when the personality of the artist was revealed in truthful abstraction of form, or in the delicacy and soft sauvity of their finest productions.

ESTIMATES.—XX.

PARTITIONS—HARDWOOD JOINERY, ETC.

LABOURS form so large and important an item in estimating, that the young estimator, that, at the risk of repeating ourselves, we think he would do wisely to acquaint himself with the proportion the labour constant bears to the material, and for this purpose a series of priced items may be dissected. Two kinds of labour, as we have said, have to be taken into account; the first the "labour from the bench," and the labour of "fixing." For these constants are given in some textbooks. Thus, in framed partitions, skirtings, &c., there is the labour in working the beads, chamfers, and mouldings, ploughing and tonguing, which are done at the bench, and the labour in fixing, and this requires plugging, backing, grounds, &c., which items must not be omitted. Thus, in the labour for fixing partitions, skirtings, &c., by means of fillets or grounds, we have the constant ·005 to be added to the material and "labour from bench." If the fixing is by plugging, the constant is ·008. Then the hanging of doors is a separate labour from the making, and we apply for it the constant ·008 for 1¼in. doors, and ·010 for 2in. and 2¼in. doors, and for folding doors ·016.

The following constants are useful for "fixing" framed partitions:—

Framed ditto per foot super	·012
" spandrels	·025
" window backs	·016

It is also necessary to learn the labours "from bench" for many kinds of joinery work of common occurrence, such as the labour to thicknesses for a great many purposes. We give a few here, and others can be found by comparison, or by the time it takes to execute any kind of work per hour.

	per ft. super.
1in. deal shelves, wrought both sides	·020 = 2d.
1in. window lining, rebated one edge and tongued at angles	·028 = 2¾d.
1¼in. window boards, rounded nosings	·016 = 1¼d.
1½in. jamb linings, double rebated and tongued at angles	·045 = 4½d.
1½in. wrought and framed outer strings	·048 = 4¾d.
1¼in. wrought, cut, and mitred ditto	·060 = 6d.
1¼in. treads and rounded nosings, and 1in. risers glued, blocked, and bracketed	·060 = 6d.
1¼in. wall string	·036 = 3½d.
1¼in. landing cross-tongued	·025 = 2½d.

270ft. super. 1¼in. deal wrot. V-jointed, upright-tongued, boarded partition, in batten widths, including backings:—

	£	s.	d.
Cost of 1¼in. deal per foot, say	0	0	2½
Planing constant, ·010	0	0	1
Tongueing and grooving (4ft. run), say.	0	0	2½
V-jointing, ·003 (4ft. run)	0	0	1½
Backing and fixing, say	0	0	2
Per foot run	0	0	9½

Laxton prices this at 10d. without tonguing.

Ditto ditto, dove-keyed.

Add to former price 2½d.

146ft. super. 1¼in. dwarf moulded wainscoting, one panel high.

Price this at about 1s.

50ft. moulded capping to ditto.

Price this at per foot run, say 3d.

16ft. super. 1¼in. deal panelled and moulded, dwarf inclosure to both.

This may be valued at 1s. 2d. per foot.

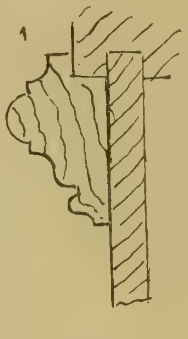
16·6ft. super. Ditto ditto, in mahogany.

Price this at four times deal, if Honduras, or 4s. 8d. per foot.

OAK AND MAHOGANY.

In pricing hardwood joinery, it is a good plan to adopt the price of deal as a base of comparison, and add a percentage to the cost as we have shown. For wainscot the price may be trebled, though it is sometimes taken at more. There is much waste in oak. The waste in deal is generally assumed to be 10 per cent.; 5 per cent. for sawing, and 5 per cent. for conversion. The waste on oak will be equal to 20 per cent. Riga and Hungarian oak make good work, especially the former; the latter is most used, and is not so likely to split and warp as English.

1



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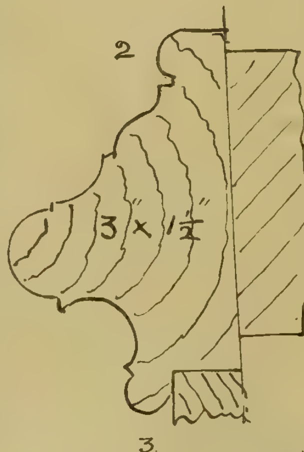

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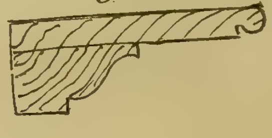

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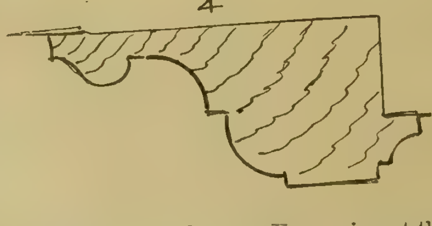


The following prices, after conversion for the latter oak for certain thicknesses, may be used:—

½in.	¾in.	1in.	1¼in.	1½in.	2in.	
5½d.	7¾d.	11d.	1s. 1d.	1s. 4d.	1s. 4½d.	per ft. super.

English oak in thicknesses, including waste, labour, and nails, are given by Laxton as:—

	1in.	1¼in.	1½in.	2in.	3in.
Rough fixed	10d.	1s.	1s. 2d.	1s. 6d.	2s. 4d.
Edges shot	1s.	1s. 2d.	1s. 4d.	1s. 9d.	2s. 7d.
Wrot. one side	1s. 2d.	1s. 4d.	1s. 6d.	1s. 11d.	2s. 10d.
Framed	1s. 5d.	1s. 8d.	1s. 11d.	2s. 6d.	3s. 8d.

Add if beaded	1d. for each side
Wrought both sides	2½d.
Ploughed and tongued	2½d.

50ft. run. 1¼in. oak skirting, in two pieces, 4½in. and 7in., rebated together and fixing.

A deal skirting of this description may be priced at about 9d.; material would be about 3d. and labour 7d. For oak we may double the labour, say—

	£	s.	d.
1ft. run of oak, 1in. by 4½in., at 11d. per foot super.	0	0	3¾
1ft. run of 1¼in. by 7in. oak at, say, 1s. 2d.	0	0	7
1ft. run labour moulding, say 4in. girt (·144 constant), say	0	0	5
1ft. 4in. super. planing (·020)	0	0	2½
1ft. run rebated edges (·006), two edges, say	0	0	1½
1ft. run fixing (·030)	0	0	3
	0	1	10¾
Add 10 per cent.	0	0	2¼
Cost per foot run	0	2	1¾

Three times 9d. (the price of deal) = 2s. 3d.

18ft. run. 4in. by 3in. oak door frame, rebated and twice beaded.

A solid fir frame of this size would cost about 6d. per foot run. If we say oak is worth three times more, 3 by 6d. equals 1s. 6d. Solid oak door-frames often crack or warp, and it is better to make the frame up in pieces of wainscot cross-tongued to a deal core. It is a little more costly, as the frame would be made a little larger.

28ft. 1½in. four-panel square-framed wainscot door.

This may be priced at 3s., if only for one.

84ft. 1¼in. square-framed doors, ditto.

A deal door of this description would be priced at about 8d. The labour would be about 5d. out of this, and the material, say, 3d.

The items in an oak door would be:—

	£	s.	d.
Material, per foot super., say	0	1	0
Labour making	0	0	8½
Labour fitting and hanging, say	0	0	2
Cost per foot super	0	1	10½

If we multiply the price for a deal door by 3 it will give 2s. per foot.

Honduras mahogany is imported in logs 2ft. to 3ft. or more square, and 12ft. in length. The prices after conversion are—

½in.	¾in.	1in.	1¼in.
0s. 7½d.	0s. 11d.	1s. 3d.	1s. 5d.

Spanish or Cuba mahogany is about 50 per cent. more, and good Talasco 20 per cent. more than Honduras. Taking labour and materials, Honduras is nearly three times the price of deal, and Spanish mahogany four times. The labour item is different in every case. Where this item is large the difference of price is greater. In items like doors, skirtings, framings the labour constant may be increased 100 per cent., and the proportion of three times deal is bound to be a fair approximation; but when the labour is small in proportion the difference is not so great. The analysis of a deal and wainscot skirting we gave above may be applied to one of mahogany, and it will be found the result is also three times the price of deal. So also the oak door *supra*. Mr. Leaning has given various items worked out in deal, oak, and mahogany, showing the proportionate value for each material, but the estimator must in most cases use his own discretion in these matters.

OAK STAIRCASE, ETC.

108ft. super. 1¼in. wainscot treads and mitred to cut string, dovetailed to balusters with carriages, &c.

In deal we have priced this kind of staircase at 1s. 5d. If we multiply this sum by 3 we get 4s. 3d.; this price is rather high.

Ditto. 1¼in. winder, circular one end.

Add 3d. to the last.

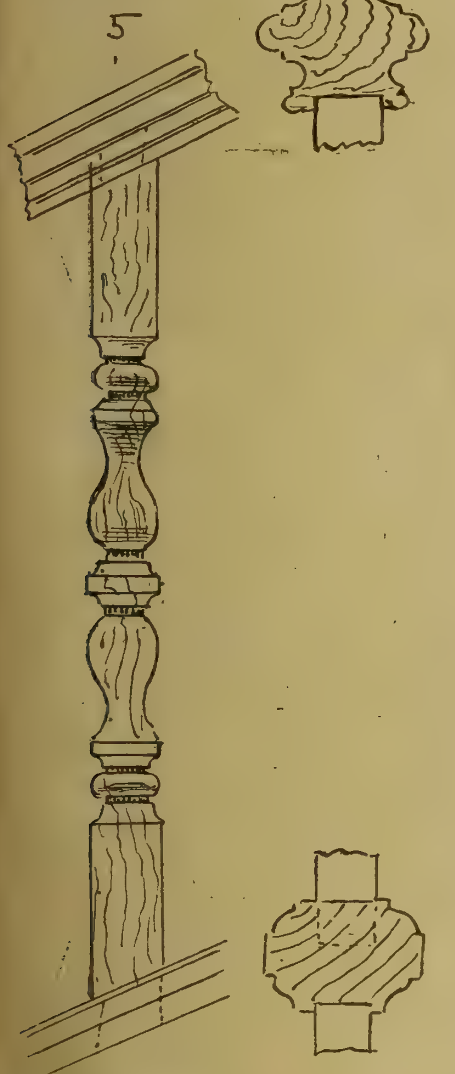
No. 11. Curtail step blocked and veneered, according to detail.

The cost would be about 18s. to 20s. each.

BALUSTERS AND NEWELS.

No. 20. 1½in. turned deal square balusters, 26in. long, with moulded caps and bases housed to deal string and handrail.

The prices of these vary. Machine-made balusters and newels run to from 12s. to 15s. per dozen, or about 1s. to 1s. 3d. each, for an ordinary moulded pattern; if of oak, 23s.



Add for fixing per foot run (constant ·025), say 6d. each.

No. 12. Square base balusters, 1¼in. square, dovetailed.

Price these at 2½d. to 3d. each.

No. 10. 2in. turned oak balusters ditto, with moulded caps and bases.

These will depend on the pattern, and may be priced at about double those of deal, say, 2s. to 3s. each. If machine-made, they may be priced at 2s. 6d. each, or 30s. per dozen net price without fixing, &c.

No. 4. On rake, ditto, ditto.

These may be priced at 3s. each more.

No. 2. 3in. by 3in. oak newels, wrought and framed, and stop-chamfered.

Without a detail it is difficult to put a price on an item of this kind, or how many stop-chamfers, and how finished.

For plain moulded, the price may be put at from 8d. per foot run. Machine-made square newels of this size of ordinary patterns, with square cap, are quoted at about 30s. to 32s. each in 4ft. 6in. lengths. For fixing newels, the constant is ·025 = 2½d. per foot run.

HANDRAIL.

324ft. run. 3in. by 2½in. deal handrail rounded, including dowelled joints and screws.

This may be priced at 9d. to 10d. per foot. For joints and handrail screws add 1s. each.

3ft. Ditto ramped.

Add 1s. 6d., about twice straight; wreathed is worth about four times.

5ft. Swan-neck ditto.

And another 8d.

20ft. run. 3in. by 2½in. Honduras mahogany handrail ditto.

This may be priced at about double that of deal, 1s. 10d. to 2s. per foot. If of Spanish mahogany, the price would be three times as much, or about 3s. 2d. per foot. Add for joints, each, 1s. 6d.

5ft. Ditto ditto ramped in Honduras.

Put for this 4s. 6d. per foot.

23ft. 4½in. by 3½in. moulded and framed mahogany handrail, dowelled, beading, joint and screws. (See sketch 5.)

We may take the items as follows:—

			£	s.	d.
1 0 0 4½	0 5	Super. 3½in. Honduras mahogany at 2s.	0	0	10
1 0 1 3	1 3	Planing, say	0	0	2¼
1 0 1 0	1 0	Super. moulding at ·144 ...	0	1	2
		Labour to making beading joint and screw, say	0	0	2
		Labour fixing at ·030	0	0	3
		Cost per foot run	0	2	7¼

The price of a deal handrail of this size would be about 1s. per foot.

No. 2. Extra for short ramps, ditto.

These may be priced at about twice the cost of straight handrail, or, if 2s. 7¼d. is the price of straight, the price of ramped would be 5s. 3d.

No. 1. 4ft. length of handrail wreathed to well-hole, ditto.

This will depend on size of well-hole. It is customary to price wreathed rails at four times straight, say 10s. 6d.

No. 1. Turned and moulded newel cap, 8in. diameter, with short ramp and heading joints.

It is impossible to price such an item without seeing detail; for ordinary work perhaps 7s. would be a fair price, and 1s. 9d. for joint.

20ft. run. 4½in. by 3in. mahogany handrail, moulded to detail and sunk for balusters. (See sketch.)

If machine-made, this may be priced at 2s. in Honduras, or 2s. 6d. in Spanish mahogany.

* * *

A HISTORY OF FRENCH ART.[*]

THIS volume, written by Rose G. Kingsley, Officier de l'Instruction Publique, at the suggestion of M. Antonin Barthélemy, will be found to comprise in a concise form the history of the three great arts of Architecture, Sculpture, and Painting, from the 12th century to the present day. Miss Kingsley has been assisted in her labours by the chief authorities of private and public collections, and the result is a readable and appreciative work on French Art. The scheme is due largely to the first-named gentleman, Attaché au Consulat Général de France à Londres, to whom the book is dedicated. To the conservators of the Palace of Versailles and of the Luxembourg Museum, to M. Roujon, le Directeur des Beaux Arts, and others the authoress acknowledges her gratitude.

Chapter I. is a valuable introduction to the subject, and gives an outline of French art from 1100 to 1500. The style of the author is elegant, and in some parts poetically descriptive. Let us just quote one passage describing the soil and race. "At one extreme we find Flanders, with its wide expanse of flat, fertile country, inhabited by a stolid and masculine people. At the other, those provinces of the South, where the soft languor of nature, basking lazily in the sun, does not hinder the southern character from being vigorously equipped for the struggles or excitements of commerce or politics—even as the fierce mistral sweeps across the sunlit land. There is Brittany—the Armorica of the ancient Gauls—dreamy and passionate, with its mysterious *landes*, peopled with supernatural beings who form part of the everyday life of the Breton peasant. Brittany, with its robust and serious faith, which makes even the most sceptical bow his head as the *Pardon* passes by; Brittany where the love even of the poorest is pervaded with an element of tender and religious sadness, &c." The authoress sums up in a few words the cause of French genius for art, "the taste for positive realisations and imaginative sentiment. And French genius has always shown itself triumphant in the handling of those two primordial forms of art, the outcome of those tendencies—architecture and its immediate successor, sculpture. The Gallo-Franc is by nature an architect and a sculptor." The only Romanesque and Gallo-Roman provinces of Provence and Auvergne, and the Romanesque of Bayeaux and Caen are glanced at, also the Later Gothic and Flamboyant which mark its decline. After this follows the effects of the Italian Renaissance, the national development of that style in the chateaux on the banks of the Loire, the palatial buildings of Paris, the severe style of Louis XIV., and the later Classic revival of the 18th century. The lines and works of the leading architects in these later developments are recorded, men like De l'Orme, Pierre Lescott, Mansard, Perrault, Fontaine, Labruste, Visconti, Viollet le Duc, and Garnier. Sculpture is also graphically treated. Once an accessory to architecture, it develops into a distinct art. Till the end of the 13th century it was religious; after that date Naturalism prevailed. This sketch of French art introduces us to the dawn of the French Renaissance at the end of the 15th century, the early period of which remained Gothic. Ornament and sculpture became first decorative; then under Louis XIII. it was subject to the Naturalist reaction.

Chapter II. deals with architecture and sculpture before the Renaissance; it opens with a passage from Viollet le Duc, in which he shows that French architecture during ten centuries was cultivated in various original schools, which came into existence spontaneously in different provinces, and were worked on different principles, each having its own character. The Church was the dominant power till the 13th century; it was confined to the cloister, though before that time a struggle had commenced between the Church and laity and the feudal lords. All the monasteries built under the rule of St. Bernard were marked by a severity of style, those under the order of Cluny were rich and luxuriant. The author traces the development of Romanesque into Gothic, and the various diversities resulting from racial and climatic influences. Inert stability distinguished the Romanesque, a balanced equilibrium the Gothic. The work of Le Duc is freely used in tracing this development. The two styles of Romanesque, that of the South in contact with Roman art, and that of Normandy and of England are traced. Oriental influences were at work in the South, as we find in the churches of Saint Front and Perigueux, based on the plan of St. Mark's, Venice. These churches exercised great influence over the Acquitainian buildings. The cathedrals of Poitiers, Angers, and Le Mans show, as pointed out by Le Duc, in their vaultings "a last trace of the cupola." We pass over later developments which reveal differences in the two styles, as the vaults of the south and the timber roofs with tile coverings. The schools of sculpture are in turn described, from its Early Byzantine character till it lost the religious influence in the 14th century, and the three great schools of Champagne, Picardy, and Burgundy united in the school of the Ile de France. The names of the chief sculptors after the art had lost its anonymous character occupy the remainder of the chapter. The next chapter, on the Renaissance from 1475 to 1589, distinguishes two periods, the first beginning at the close of Louis XI. reign, 1475, and ending with the death of Francis I., 1547; the second from Henri II. and ending with the assassination of Henri III., 1589. The climax was reached during the reign of Francis I. The perfected ideal of life was attained during this period; the soul and body were both cultivated. We have this ideal eloquently put before us.

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[*] A History of French Art, 1100-1899. By ROSE G. KINGSLEY, Officier de l'Instruction Publique. London: Longmans, Green, and Co.

The Gothic donjon was veiled faintly by a surface of delicate Italian traceries; but we pass on to the next chapter or the architects of the Renaissance; amongst those recorded are Fierre Lescott, 1578, the architect of the Louvre, afterwards made a canon of Notre Dame; Philibert de l'Orme, 1570, builder of the Tuileries, Jean Bullant, Jean Texier, Bastion François Byart, Gilles Le Breton, architect of Fontainebleau. The sculptors and painters of the Renaissance are critically described in the next two chapters, and we have examples of each of their works in the chief collections. The art under Henri IV. and Louis XIII., 1589 to 1643, is an interesting epoch. Towards its close a decadence in art was manifest; and, from the commencement of the 17th century, religious painting and sculpture was succeeded by learned efforts, and pictures supplanted religious painting. A biographical sketch of the painters, architects, and sculptors of this period adds much to the completeness of the narrative. Of course the "grand siècle" of Louis XIV., with the founding of the Academy and the building of the Palace of Versailles, is fully described, with its list of great painters, sculptors, and architects and their works, but we have no space to enlarge.

Art was beginning to throw off its shackles; it was less severe and rigid, as we see in the decorative sculptures and plaster-work at Versailles. The 18th century gives us grace instead of magnificence, coquetry instead of pageantry, as we find in the works of Watteau, Boucher, and Greuze. Greece and Rome had no longer sway. Of architects there were Gabriel, Soufflot, the architect of Sainte-Geneviève (the Pantheon) and the Cathedral of Rennes, and Desmaisons, appointed architect to the King. "What the Revolution did for Art" and "Art of the 19th Century" are interesting chapters, and the arts are brought up to date with its lists of architects, sculptors, and painters. Rose Kingsley's history adds an interesting volume to the literature of French art.

An inquiry was held at Broom, near Alcester, on August 31, by Colonel Hepper, R.E., Local Government Board inspector, in reference to the proposed bridge over the Arrow there, to replace a dangerous ford. The estimated cost of the bridge is £2,900.

PROTECTION OF NATURAL WATER SUPPLIES.

THE secretary of the County Councils Association has addressed the following circular letter to the clerks of county councils, county boroughs, and all urban and rural district authorities in England and Wales:—

"At the recent annual meeting of this association attention was drawn to the present condition of the law as affecting sources of water, which are or may become necessary for local consumption, and the advisability of conferring powers upon local authorities in regard thereto. On the question being referred to the executive council, a committee was appointed, consisting of the Lord Belper, chairman, Notts County Council; Sir J. F. Lennard, chairman, Kent County Council; Mr. E. J. Halsey, chairman, Surrey County Council; Mr. T. F. Halsey, M.P., Alderman, Herts County Council; and Mr. W. J. Freer, clerk, Leicestershire County Council, for the purpose of considering the question, and reporting to a future meeting of the council. The importance of the subject is now generally admitted, and the president of the Waterworks Engineers' Society, at their recent annual meeting, alluded to it at length, and to the necessity of immediate steps being taken to protect the rights of localities in the natural water supplies existing within their areas. It is true that, owing to the action of this association, the standing orders of both Houses of Parliament have been assimilated, and county councils can now appear before committees of either House upon all Water Bills affecting their interests or the interests of local authorities within the administrative county. That they can do so with success was proved during the last Session of Parliament in the matter of the Derwent Valley Water Act, 1899. The difficulties that exist in the present state of the law, as it affects private rights in water, appear to be of the gravest character. The following concrete case will illustrate this:—Certain urban districts are supplied by a local water company. Another water company, desiring to add to its powers of supplying an important centre, purchases land outside its own area, but within the limits of the urban districts, proposes to sink a well thereon, and arranges with a railway company to carry the main along the railway line into its own distributing area. It is not obliged to obtain consent either to borrow money for the work or to open-up roads. In the opinion of counsel, the water company and the railway company are both acting within their rights, and cannot be stopped, although the district authorities, and the county council desirous of assisting them, are fully persuaded that the action of the intruding company will result in the district being deprived of the water supply which exists within its own area, and is necessary for the use of the inhabitants and for their health. Attention has been drawn to another way in which the water supply is threatened in some districts, and which is becoming of very great importance. It appears that hitherto it has been the practice of colliery companies to exclude the water contained in the permeable strata, through which the shaft passes, from the pits by lining the shaft with iron tubbing. During the sinking of a new shaft it has been necessary to keep down the water by pumping, and this has in many cases dried the neighbouring wells for a time; but when the tubbing was placed in position the pumping was stopped, and the water in the soil returned to its normal level. It seems, however, that at collieries now being opened in certain parts of the country the plan of tubbing is being given up, and it is proposed instead to pump in perpetuity, a separate shaft being in some cases sunk for this purpose only. The association are informed that at the present moment, in a new pit in a certain part of England, a shaft is being sunk for pumping purposes only; and though the coal is not nearly reached as yet, millions of gallons of water are being pumped to waste every day. Four miles from this pit some strong springs have ceased to flow, and this is attributed to the pumping operations of the colliery proprietors. The instances given above point to two only of the many ways in which a local water supply may be seriously affected; and, as the law at present stands, it does not appear that local authorities have any power to protect the interests of their ratepayers. The committee of this association propose to consider whether it is possible, by legislation or otherwise, to invest local authorities with some such power, or to devise some other remedy for the admitted evil. I am, therefore, directed to inform you that the committee will be glad to receive from you any information bearing upon the subject, and any suggestions which your council may care to offer.

NATURAL VENTILATION.—VI.

By Robert Boyle.

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IN hospitals in warm weather, when there is but little difference between the inside and outside temperature, windows may safely be utilised for the admission of air. Care should be taken, however, that the incoming air does not blow directly on to the patients. In towns or cities canvas or copper wire screens should be fixed across the openings to filter the air and break the force of the current. These screens should be cleansed at short periods.

In cold weather, when the heating arrangements are in operation, it is absolutely necessary to make special provision to admit the air supply without draught, and in such a manner as to insure the most complete diffusion, and an equable movement of the air throughout the ward.

A number of small air inlets fixed round the walls at a height of about 5ft. 9in. insures the best distribution. The air should pass direct through the openings in the walls into the tubes or brackets, and be delivered in an upward direction at a velocity not exceeding 2ft. per second. These inlets should be fitted with filters and regulating valves, and be easy of access for cleansing purposes.

Long air channels should be avoided, as they harbour dirt, and are difficult of access. When the air supply is warmed by passing through a ventilating radiator, it may be admitted at a low level.

Inlet openings under the beds are not to be recommended unless provision be made for warming the incoming air in cold weather, otherwise a disagreeable draught on the feet of the attendant nurses and doctors would result.

In the winter, when the external air is cold and heavy, if windows are opened at the top, the air upon entering immediately descends, owing to its greater density, and presses down and returns the ascending exhausted air to be rebreathed. This down-draught cannot but prove injurious to the patients, as well as to the other occupants of the ward. Open windows should, therefore, never be resorted to in cold weather. The vitiated air should be extracted at the ceiling level to where it naturally ascends, and never allowed to return to be rebreathed.

The authorities on the subject recommend a natural method of ventilation in preference to artificial arrangements, as, when properly planned, it is found to be at least equally as effective, and more easily and cheaply applied than artificial ventilation.

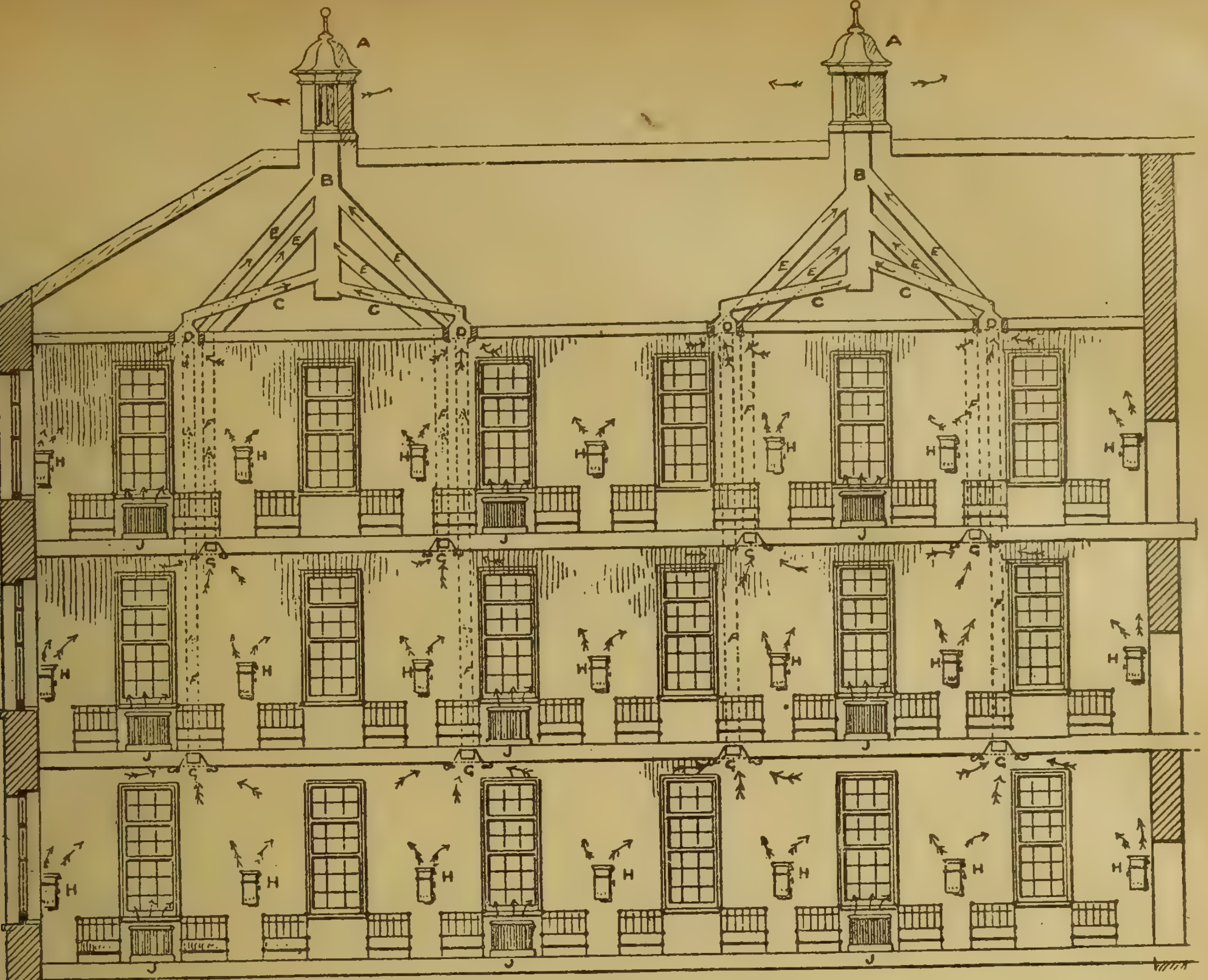
Dr. Parkes says: "For hospitals natural ventilation certainly seems the proper plan."

Sir Douglas Galton, in "Hospital Construction," referring to the ventilation of hospitals, says: "The more the question is examined, the more advisable does it appear to adhere to simplicity in all details of hospital construction."

Downward ventilation by propulsion, or forcing air in at the higher parts of the wards, and permitting it to escape at a lower level, is a total inversion of the laws of nature which govern ventilation, and as such is correspondingly defective, as the powerful ascensional movement of the warm expired air which is expelled from the lungs at a temperature of 85° to 100° Fahr., instead of being employed as an aid to ventilation, as with a natural system, is an obstacle which has to be overcome by the expenditure of a great deal of power, for which there is no equivalent return, before the system can be said to be operative. Only what would prove a wholly unbearable down-draught could possibly prevent the warm expired air from ascending, which, with this system, is returned to be rebreathed along with the products of combustion and other impurities.

With down-draught ventilation by propulsion from three to four times the volume of air is required than is necessary with the upward method, constituting it a very expensive system.

Open fireplaces in wards should never be employed as foul-air exits, as the upper strata of heated and impure air is drawn downwards to-



LONGITUDINAL SECTION OF A HOSPITAL OR ASYLUM FITTED WITH A NATURAL SYSTEM OF VENTILATION.

A A, Roof ventilators. B B, Main extraction shafts. C C, Branch extraction shafts connected direct with foul-air exit openings, D D E E, Branch extraction shafts connected with upcast flues, F F, constructed in walls. G G, Foul-air exit openings in centre of ceilings, connected with upcast flues by shafts between joists in channels formed in concrete floor. H H, Air-inlet brackets for admitting screened purified air, may be fitted with air-warmers or disinfecting chambers. J J, Ventilating radiators, admitting warmed, screened, and purified air. [Note.—All the inlets are fitted with regulating valves for controlling the air supply, which passes direct from the outside into the building.]

wards the fire, and rebreathed by the occupants of the ward. Provision should be made for a separate supply of air to the fires, so that they will not draw from the wards, or unduly interfere with the ventilating arrangements. If it is desired to utilise the up-draught created by the fire, a mica flap valve might be fixed in the flue immediately below the ceiling.

The wards of a hospital, or the dormitories of an asylum should never be heated by hot air.

If the fresh air is raised to a temperature such as is necessary to efficiently heat a building, its health-giving properties are thereby considerably deteriorated, and the oxygen it contains being partially destroyed, it is rendered unsuitable for healthy respiration.

It may be accepted as an axiom in ventilation that the warm exhausted air, which naturally ascends, should never, under any circumstances, be permitted to return to the breathing zone, and any method of ventilation which admits of this is not only worse than useless, but is a positive danger to health, and completely fails to achieve the object in view.

With respect to down-draught ventilation as applied to a hospital, Sir Douglas Galton in "Hospital Construction" says: "Surgeon-General Billings, of the United States Army, mentioned an experiment in the Barnet Hospital, Washington, where fresh-air inlets for warmed air were placed near the ceiling, and extraction outlets in the floor.

'In this experiment it was found that when warm air was admitted near the ceiling there was a difference of 10° in the temperature between the floor and the ceiling, and that the patients complained of cold feet and discomfort.

"Surgeon-General Billings also remarks that when the warm air is introduced near the ceiling it is impossible to vary the temperature at different beds—a thing which it is often desirable to accomplish in a hospital."

In a recent article on ventilation, referring to downward ventilation, it is stated that—

"The breath from a fever patient, being of a higher temperature than that of a person in ordinary health, ascends to a greater height before being pressed down by the descending current, and is inhaled by those who may be close to the bedside, owing to the spreading and consequent diffusion that takes place. Where the current is upwards, as in natural ventilation, the breath from the patient ascends in an unbroken column, and is immediately drawn away without coming into contact with anyone.

"With a down-draught system the patient must inevitably rebreathe a considerable portion of not only his own exhausted air, but also a certain proportion of that of the patients on each side of him and of persons standing about his bed.

"The watery vapour of his breath in which the disease germs are suspended is likewise precipitated on to the bedclothing by the downward current, and there accumulating, proves not only a means of considerably retarding his recovery, if it is not indeed the actual cause of his death, but is a dangerous source of infection to others.

"No amount of air forced on this plan into a building could make the ventilation either efficient or safe."

Sir Douglas Galton holds that "Wherever a building is occupied permanently with definite conditions it is far better to trust to the ventilation of nature—natural ventilation—than to the artificial pumping-in of air. During that part of the year when the windows can be opened at least fifteen to twenty times as much fresh air would be admitted into the ward per patient than could be obtained if the air was pumped in, as in the Birmingham Hospital, and that was much more beneficial to the patients. I visited (says Sir Douglas Galton) the Victoria Hospital at Glasgow, and went through the wards. I then went out with the matron or head-nurse into the Nursing Sisters' Home which was attached to the hospital. I said to the matron, 'Why do you not, if you speak so highly of the system of forcing the air into these wards as being so very desirable, adopt it in your own nursing homes?' and she replied, 'We find the open windows so very much more refreshing!'"

Mr. Keith Young, F.R.I.B.A., in a paper read before the Architectural Association, London, said: "The question which concerns us is this: Is there any evidence to prove that wards cannot be kept sufficiently sweet and healthy without recourse to expensive appliances? So far as the experience of hospitals in this country goes, I think that not only is there no such evidence, but that there is some very definite evidence in support of the exact converse.

"A distinguished Paris surgeon, Dr. Le Fort, published a report on hospital hygiene. He there compares the mortality in London hospitals with that of the Paris hospitals, very much to the disadvantage of the latter, and professes himself decidedly in favour of the natural system of ventilation adopted in London to the artificial systems in vogue in some Paris hospitals. But he says one need not go to England to search for means of comparison between the two systems; for the two hospitals in Paris, where the mortality is greatest, are precisely those in which artificial ventilation is employed."

Sir Henry Burdett, in "Hospitals and Asylums of the World," says: "Having regard to the temperate character of the British climate, we have yet to be convinced that it is desirable or necessary to introduce artificial ventilation into our hospitals. . . . At Guy's Hospital (new building) the artificial system can be compared with the natural system in the older wards, and the result of the comparison certainly does not make for the superiority of the former method."

Mr. G. H. Bibby, F.R.I.B.A., states that "There is sufficient evidence to show that such buildings as asylums, workhouses, and hospitals are best ventilated by natural means, and no architects of great repute have of late years relied upon mechanical ventilation."

Ventilation by means of hot-air aspiration is not in accordance with the views of modern engineers or with their ordinary practice.

St. Mary's Hospital, London, says Sir Henry Burdett, in "Hospitals and Asylums of the World," "affords some instructive lessons in ventilation. In their report on this hospital Dr. Bristowe and Mr. Holmes referred to the existence of a central shaft for extracting the foul air from the wards in which a fire was always kept burning. They said 'The secretary informed us, however, that there was reason to suppose the whole apparatus is a failure; that Dr. Sanderson had made numerous experiments, which led him to the conclusion that the orifices of exit in the wards act little, if at all, and very often admit air instead of carrying it off, and that there is, in fact, rather a circulation of air in the shaft than an escape of air from it.' In summing up their conclusions these gentlemen said: 'The hospital cannot certainly be regarded as a healthy one, for most of the diseases which constitute unhealthiness in a hospital seem to prevail in an unusual degree, and there seems also to be considerable spread of infectious fevers.'"

PORTLAND IN A.D. 1756.

A VERY interesting splendidly-printed and illustrated volume is "A Narrative of the Building, and a Description of the Construction of the Eddystone Lighthouse," by John Smeaton, Civil Engineer, F.R.S., published in 1791. The letterpress in the main consists of a kind of diary kept by Smeaton during the whole course of the erection of this far-famed lighthouse (now standing upon Plymouth Hoe, where it was placed after the erection of the present lighthouse, built A.D. 1878-82). Prior to the erection of this wide-known beacon, Mr. Smeaton, in his professional capacity, visited most of the best-known quarries in the South and West of England, amongst them—in May, 1756—those on the Isle of Portland. He went with an introduction to a Mr. Roper, the manager of the principal quarry there, whom he describes as "a very plain, sensible, intelligent person." He does not appear, however, to have been a native, for we learn that, "upon the commencement of the works of Westminster Bridge, some time about the year 1739, Roper was sent down by the contracting mason as foreman with a gang of masons or stonecutters from London, who were, according to moulds and drawings, to hew the stones upon the place, to save the freightage of the waste; for, it is to be observed, that previous to this period the stone sent from Portland had always been stripped off in the rough, or rather what is called rough *scappelled* blocks, to be sawn and fair wrought to the particular purposes where wanted, and after the completion of that work, having engaged with Mr. Tucker as superintendent of his quarries, he has remained there ever since."

Here, then, we get a record of the first quarry-worked Portland stone ever used in London. It seems to have been introduced there 160 years ago. That the stones, in this particular case, were well selected I can personally testify, for after Westminster Bridge was taken down to make room for the present one a deal of its old stone was re-used in A.D. 1864 upon the Grosvenor Mansions, W. Working there as a journeyman carver, it fell to my lot to recut a lot of it, and it was, without a doubt, the hardest Portland stone I ever worked in my life.

The author tells us the local "quarry men work with a tool called a *kevel*, which is at one end a hammer, and at the other an axe, whose edge is so short or narrow that it approaches to the shape of a pick. It is a tool curiously formed for the purpose required, the face of the hammer end not being too flat, but hollowed according to the portion of the surface of a cylinder. This gives a keen edge to two of its opposite sides that are parallel to the handle, and by this means biting keenly upon the stone brings off a *spawl* or large shiver. The edge at the pick end is about half an inch in breadth."

After describing the quarries and their surroundings with a minuteness of detail that suggests a sigularly observant mind, Mr. Smeaton tells an odd anecdote respecting the every-day manners and customs of the Portland quarrymen as follows:—

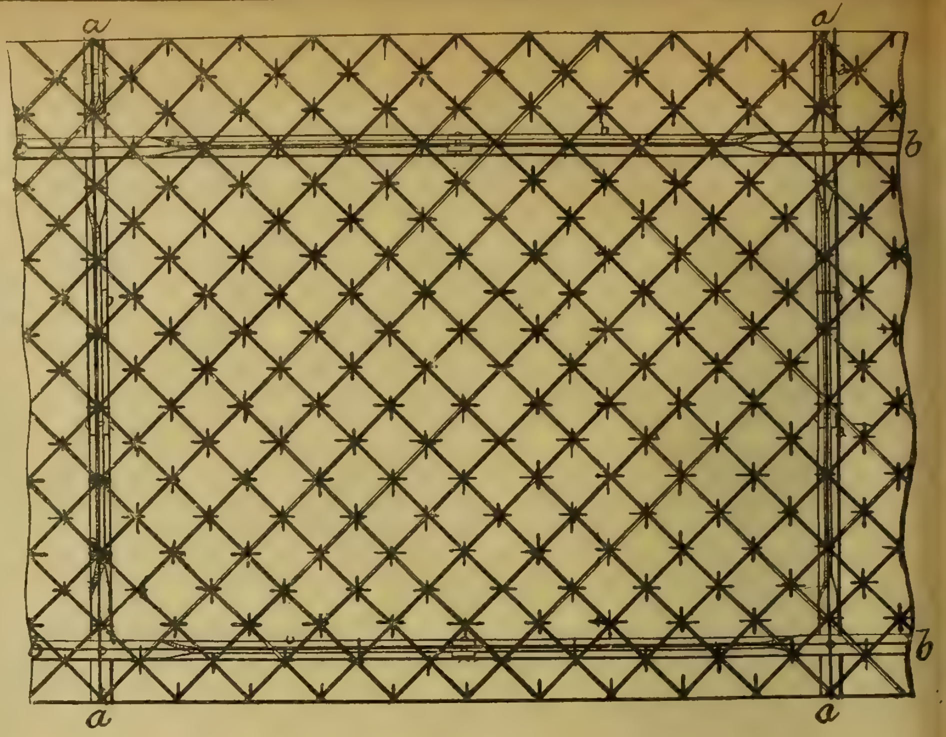


Fig. 1.

"While looking over the quarries, and attentively considering the operations, observing how soon the quarrymen would cut half a ton of *spawls* from an unformed block, and what large pieces flew off at every stroke; how speedily their blows followed one another, and how incessantly they pursued this labour, with a tool of from 18lb. to 20lb. weight, I was naturally led to view and consider the figure of the *operative* agent, and after having observed that by far the greater number of the quarrymen were of very hardy, robust form, in whose hands the tool I have mentioned seemed a mere *plaything*, I at last broke out with surprise, and inquired of my guide, Mr. Roper, where they could possibly pick up such a set of stout fellows to handle the *kevel*, which in their hands seemed nothing; for I observed that in the space of fifteen minutes they would knock off as much waste matter from a block of stone as any of that occupation I had ever seen before do in an hour. Says Roper, 'We do not go to fetch those men from a distance; they are all born upon the island, and many of them have never been further on the main land than to Weymouth.' I told him I thought the air of that island must be very propitious, to furnish a breed of men so particularly well formed for the business they follow. 'The air,' he replied, 'although very sharp, from our elevated position, is certainly very healthful to working men. Yet if you knew how these men are produced, you would wonder the less, for *all* our marriages here are productive of children.' On desiring an explanation how this happened, he proceeded. 'Our people here, as they are bred to hard labour, are very early in a condition to marry and provide for a family; they intermarry with one another, very rarely going to the main land to seek a wife; and it has been the custom on the island from time immemorial, that they never marry till the woman is pregnant.' 'But pray,' says I, 'does not this subject you to a great number of bastards? Have not your *Portlanders* the same kind of fickleness in their attachments that *Englishmen* are subject to? And, in consequence, does not this produce many inconveniences?' 'None at all,' replies Roper, 'for, previous to my arrival here, there was but one child on record of the parish register that had been born a bastard in the compass of 150 years. The mode of courtship here is that a young woman never admits of the serious addresses of a young man, but, on supposition of a thorough probation—when she becomes with child—she tells her mother; the mother tells her father; her father tells his father, and he tells his son, that it is then proper time to be *married*." 'But suppose, Mr. Roper, she does *not* prove with child, what happens then? Do they live together without marriage? or, if they separate, is not this such an imputation upon her as to prevent her getting another suitor?' 'The case is thus managed," answered my friend. 'If the woman does not prove with child after a competent time of courtship, they conclude they are not destined by Providence for each other; they, therefore, separate, and as it is an established maxim which the Portland women observe with great strictness, never to admit a plurality of lovers at one time, their honour is in no ways tarnished. She, just as soon (after the affair is broken off) gets another suitor, as if she had been left a widow, or that nothing had ever happened, but that she had remained an immaculate virgin.' 'But, pray, sir, did nothing particular happen upon your men coming down from London?' 'Yes,' says he, 'our men were much struck and mightily pleased with the facility of the Portland ladies, and it was not long ere several of the women proved with child; but the men being called upon to marry them, this part of the lesson they were uninstructed in, and on their refusal the Portland women arose to stone them out of the island—insomuch that those few who did not choose to take their sweethearts *for better or for worse*, after so fair a trial, were in reality obliged to decamp, and on this occasion some few bastards were born; but ever since then matters have gone on according to the ancient custom.'"

There is a good deal else that might be quoted from this interesting and now rare book, and to which we may return at some future time.

Exeter. HARRY HEMS.

USE OF EXPANDED METAL FOR THE PROTECTION OF CANAL BANKS.

THE various applications of the modern combination of iron, or preferably steel, and cement concrete are daily increasing. It is of little or no consequence whether the intimate combination of the materials take the form of the Monier, the Möller, the Cognet, or the expanded metal system; the result is the same, and points to a more extended use of this method of construction for several important purposes. One of the most recent examples of its practical value is the employment of it for the protection of canal banks, which we consider sufficiently interesting and at the same time instructive, to our readers to briefly describe and illustrate. It should be mentioned that it appears that the honour of first entertaining the idea of applying a steel and cement protection to the slopes of canals is due to the inhabitants of the Pays Bas. Subsequently the subject was taken up by the Belgian Government, who carried out numerous experiments for the purpose of thoroughly testing the merit of the new principle. It was in the neighbourhood of Potsdam, the capital of the German province

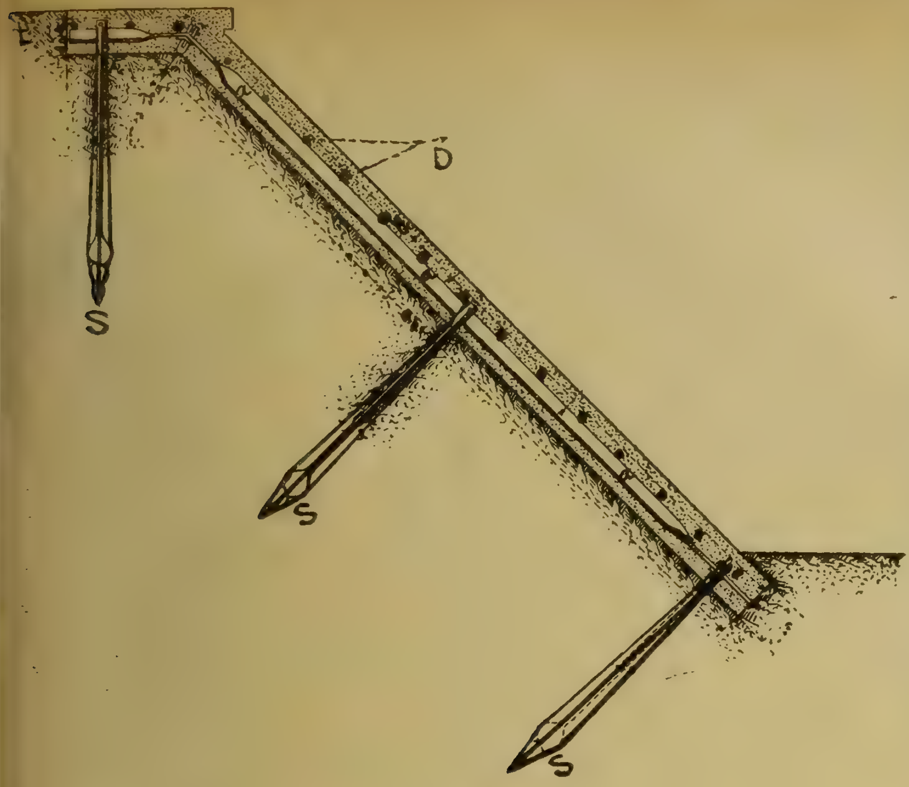


Fig. 2.

of Brandenburg, that a length of over 500ft. of metallic cement casing or trellis-work was laid along the two banks of the Winton Canal.

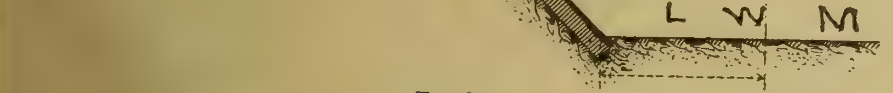


Fig. 3.

An elevation showing the general appearance of this mode of construction and the strong resemblance it bears to the expanded metal system, is given in Fig. 1. The whole of the trellis facing is imbedded and flushed over with cement concrete, but the surface layer or coating is supposed to be removed in the illustration in order the better to display the character of the work. It is evident that the whole surface of the iron casing consists of a number of rectangular divisions, one of which is shown in Fig. 1. Each of these is held in its place and fastened to the concrete by the inclined and horizontal bars *a b*, and also by small cleats and spikes inserted at the intersection of the squares or meshes, which measure 9in. along each side. A reference to the cross-section in Fig. 2 will serve to render the explanation of the method of construction adopted perfectly clear and intelligible. After the slope has been dressed off to the required inclination, a layer of concrete is spread fairly uniformly over its whole surface, and upon it are laid the inclined and horizontal flat bars of iron shown in Fig. 1. These sloping and horizontal bars, which are 3in. wide by ¼in. thick, are so arranged that the series of rectangular frames formed by them are 17ft. and 11ft. apart respectively. Upon these flat bars are fixed by means of iron wire, small iron rods, D in Fig. 2, ¼in. diameter forming the meshes shown in Fig. 1. Over the whole an upper layer of cement concrete 6in. in thickness is laid, amalgamating with the under layer and bound into it, through the meshes of the metallic trellis-work. The entire surface casing is firmly maintained *in situ* by the long sharp-pointed wedge-shaped iron holding down bolts S in the cross-section Fig. 2. These anchor stakes may be either driven or screwed into the solid bank, accordingly as the substratum is best suited to the one or the other. Broken brick, gravel, or, in fact, any dry, clean, hard material will answer for mixing with the cement to make the concrete. As soon as the frame and casing have completely settled and come to their bearings, the surface is flushed up or grouted with a thin layer of diluted neat cement. The advantages claimed for this mode of protecting canal banks, and which, in our opinion, may be very fairly put forward, are facility and rapidity of construction, a more than a mere sufficient amount of solidity, durability, and resistance to the wear and tear to which all canal banks are unavoidably exposed, and lastly, though by no means leastly, a first cost comparatively low. It may at the same time be here remarked that what is required of these protective works is to preserve the slopes and banks of the waterway from the wash and erosive action of the stream, and that they are not called upon to act in any manner as *bonâ fide* retaining or walls of revêtement. The banks of the canal are formed and dressed to a slope, which is flat enough to insure their stability, and to prevent them from sliding into the channel, before they are covered by the protecting metallic trellis-work.

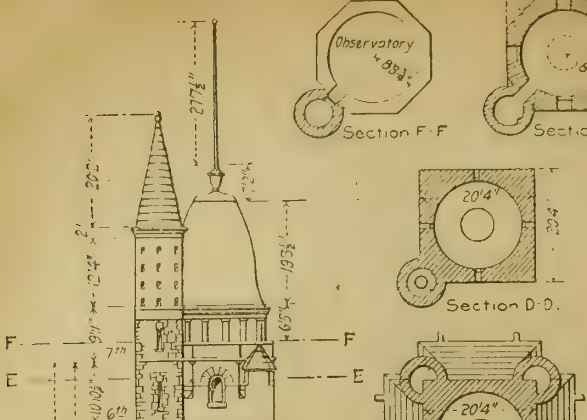
In the example we have selected, anchor-bolts or screws were used to hold the whole mass, comparatively superficial as it may seem to be, firmly together; but some engineers object to their employment, and the case of the canal from Dortmund to Elems is adduced in support of the prohibition. It was alleged that, owing to the action of frost and other causes of a climatic nature, the anchor-screws worked loose, and that fissures and cracks occurred at intervals in the concrete. This is quite possible; but it was very likely due to one or two causes, or perhaps to the existence of both, which might very readily have been guarded against. It is perfectly well known that some strata afford very bad holding ground, and to attempt to anchor any piece of superstructure to them will eventuate in a failure. Again, in the instance under notice, it is more than probable that the other cause came into play, and that was that the anchor-bolts were not sufficiently long and heavy. A cross-section in Fig. 3 of the channel of the Winton canal shows that, in that case, the anchor-screws were dispensed with. Not only experiments, but the execution of iron trellis coverings, have proved, with very rare exceptions, that unless a regular series of joints be introduced into the work, the occurrence of longitudinal cracks is inevitable. These will not be altogether eliminated by the metallic casing, though in some instances they may be materially modified and greatly reduced in number and magnitude. It is generally admitted, even by those who condemn the use of anchor-screws upon the grounds that the iron and concrete structure should be heavy enough to maintain its position by its own weight, that the anchor-bolts are admirably adapted to replace the old wooden pickets employed for holding down fascine work, as they penetrate into the ground with ease through the timber work, and when once firmly fixed are not liable to be displaced. This description of anchored framing was adopted successfully in the new training walls of the lower part of the river Weser, in which the iron stakes were driven at distances of 7ft. apart. It has been ascertained that an anchor-bolt screwed into ordinary sand exactly after the manner of a screw pile, with a blade 6in. in diameter will resist a pull of a ton and a half, and a greater tension commensurate with a proportionate increase in the size of the disc. Since these small screw-piles (as the anchorages really are) exert their maximum resistance at a depth of 8ft., there is no advantage to be gained by screwing them any deeper into the ground. If, therefore, a greater resistance is required, the number of piles must be increased. It should be remarked that one of these anchors can be screwed down manually by a couple of men in much less time than a stake could be driven down by the same amount of labour. When it is borne in mind that canal and river banks are protected by miles and miles, there ought to be a large scope for the employment of the compound system of construction in iron or steel and cement concrete.

* * *

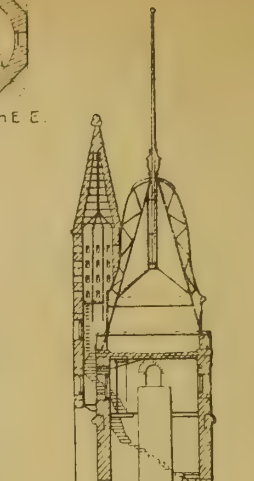
COMPTON HILL WATER TOWER, ST. LOUIS.

A LARGE and attractive masonry water tower, inclosing a steel standpipe, is nearing completion in Compton Hill Reservoir Park, St. Louis, Mo. It is built of granite, limestone, and brickwork, and the main tower rises about 171ft. above the ground, exclusive of a flag-pole, which rises 28ft. higher. The main entrance to the tower is from a balcony on the west side through an arched doorway leading to the first floor, which is about 15ft. above the ground. At the top of this doorway is a course of carved limestone extending around the four sides of the tower. For the greater part of its height the tower is rectangular in shape. At the base it measures 28ft. 9in. on each side, exclusive of the balcony, while at a height of about 41ft. from the ground the tower decreases in size by offsets and from three corners of the larger section dwarf towers rise which end at a height above the ground of about 59ft. The fourth corner carries a small circular tower, 5ft. 5in. in internal diameter, which extends above the main tower, and incloses a 24in. overflow from the standpipe. At a height of about 130ft. above the ground the main tower becomes octagonal in shape, and contains an observatory, above which is the roof.

Dark grey granite was used in the three lowest courses of the tower, in the exterior steps, in the



ELEVATION AND SECTIONS OF TOWER.

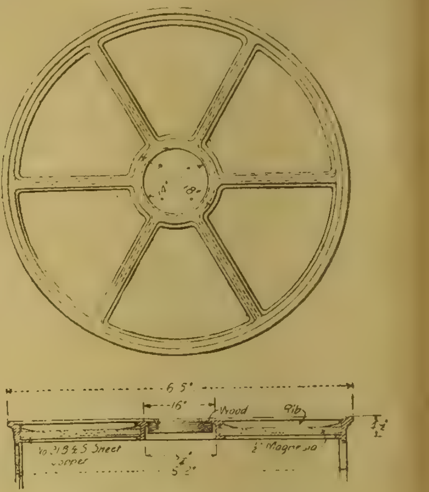


sills of all exterior doors, and in the observatory and balcony wall copings. All of the exposed faces are of six-cut work. Bedford blue limestone was used in all the rest of the coursed stonework in the balcony and base of the tower, in the carved course above the main entrance, in the parapet walls above the steps and balcony, in the lintels and jambs of doors and windows, arch stones, dome roofs of the dwarf towers, roofs of the octagon battlements, and in the cornices, brackets, and gargoyles. The remainder of the stonework, including the facing of the exterior walls of the dwarf and overflow towers, is of limestone, having a uniform white colour. The outside walls of the main tower above the point where it is reduced in section are of two shades of buff, hard-pressed brick. The interior face of the parapet wall in the observatory is of selected Mack paving brick of uniform yellow colour. The first course of granite in the base of the walls is backed up with the best quality of small size shale vitrified brick. The rest of the brickwork, including the interior faces of the main and the overflow towers above the first granite course, is of selected hard-burned red brick. The brick backing of the walls was built up even with the stonework as the work progressed.

The standpipe, 6ft. in diameter, rises 128ft. above the level of the ground, and is built of open hearth soft steel. The specifications for the steel required that it should be tough and ductile, and should not contain more than 0·06 per cent. of phosphorus. Before or after heating to a cherry-red heat and quenching in water at a temperature of 80° Fahr., it was required to stand bending 180° to a curve whose inner radius was equal to half the thickness of the sample, without sign of fracture on the convex side of the bent portion. Test specimens of an area of cross-section not less than ½sq.in., cut from the finished material after rolling, were required to have an ultimate tensile strength of 52,000 to 62,000lb. per square inch, and an elongation of not less than 25 per cent. in 8in. The contractor was also required to furnish from each melt several bars, each 2in. wide and 10in. long, cut from the finished plates. These specimen bars were nicked and tested for toughness or ultimate resilience in an impact or drop-test machine, and the tests were compared with similar tests of a good quality of wrought iron. They were required to withstand a blow that would just break a wrought-iron bar of the same form and dimensions. The plates are $\frac{7}{16}$in. thick at the bottom of the standpipe, and ¼in. at the top.

The standpipe was built up of alternate inside and outside sections, the internal diameter of the latter being 6ft., and the build of each being 5ft. All plates were of such lengths as to make but two vertical joints in each course. All of the joints, both horizontal and vertical, are lap joints, the former being single and the latter double riveted. The standpipe is connected at the bottom to a section of cast-iron pipe 7ft. long and 6ft. in diameter, set in the bottom of the tower below the surface of the ground. The connection was made by means of a cast-iron ring, which was riveted to the standpipe and set in the bell of the cast-iron pipe with a lead joint. The cast-iron ring is 2in. thick, and is double riveted to the standpipe with a $\frac{5}{16}$in. filler-plate extending just below the upper line of rivets.

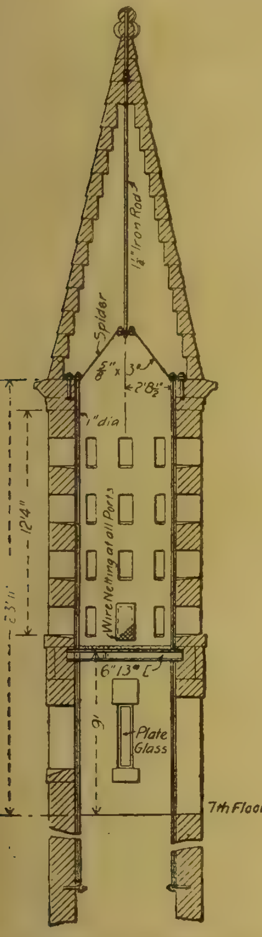
The overflow pipe in the small tower is 24in. in diameter and rises about 120ft. above the surface of the ground. It is built of ¼in. steel plates, of the same quality as in the standpipe, in lengths of 5ft. with alternate inside and outside sections. For convenience in erection the contractors riveted the pipe up in lengths of about 30ft. with cast steel flanges. The overflow pipe is connected to a cast-iron pipe at the bottom by means of a lead joint. This lead joint and that at the bottom of the standpipe were made by the city and not by the contractor for the stand-pipe and tower. There are two connections between the standpipe and the overflow pipe. One of these is a by-pass 12in. in diameter, located at a height of about 75ft. above the ground and fitted with a 12in. outside screw wedge valve. The other is a 24in. overflow pipe and is located at a point about 110ft. above the ground. The 24in. connection between the standpipe and overflow pipe changes in section from a 24in. circle to an ellipse 18 by 30in., where it connects with the latter. The rivets in both standpipe and overflow pipe are of charcoal iron and were driven by hand. All of the steel work received two coats of red lead mixed in raw linseed oil before leaving the shops. After erection the standpipe and overflow pipe both inside and out were covered with two coats of mineral paint.



DETAILS OF TOP OF STANDPIPE.

The standpipe is covered with a layer of magnesia 1in. thick, held in place by sheet-iron plates of No. 20 B. and S. gauge, except at the base castings, where a canvas jacket was used. The iron plates were firmly screwed to two hardwood strips embedded vertically in the magnesia. The horizontal joints between the sections were covered with a 3in. band of hoop-iron fastened to the wooden strips. The overflow pipe was also covered with magnesia, 1in. thick, wrapped in canvas and secured by brass bands. The top of the standpipe has a cover of cast iron ½in. thick, reinforced by ribs, with a circular manhole in the centre, 16in. in diameter. Except at the manhole, it is lined with 1½in. of magnesia, held in place by sheet copper of No. 21 B. and S. gauge.

There are seven floors in the tower, the first one at the main entrance from the balcony, and the seventh, the observatory floor, at an elevation of 135ft. above the ground. Plate-glass windows were set in the walls at the different floors. Stairways leading from one floor to the next are located between the standpipe and the masonry tower, except at the sixth floor, where there is an opening from the main tower to the overflow tower, and the latter contains the stairway to the seventh floor. All of the floors are made of iron or of granitoid, and are supported by I-beams built into the walls and around the standpipe. The floor of the observatory is 4in. thick, of granitoid on No. 16 B.G. corrugated sheet iron, supported by four 8in. I-beams, each weighing 18lb. per foot. The substratum of the granitoid was made of four parts of fine crushed granite to one of American Portland cement, and the top dressing was made of equal parts of cement and sifted granite. The floor drains to the centre, where there is a cast-iron cesspool, with bell-trap, set even with the finished elevation of the floor, and connected with a copper drain-pipe 3in. square, which in turn connects with a 4in. by 4in. copper pipe running down the overflow tower to the foundation. Copper pipes from each outlet of the roof-cornice gutter were also run to this pipe in the overflow tower. A copper strap was bonded to this pipe and to the shell of the overflow pipe with a copper stud to make a ground connection for lightning. A similar connection was made from the copper pipe to one of the anchor rods of the overflow tower roof. The ceiling of the observatory tower is of No. 24 galvanised flat iron fastened in place with copper wire, and made to conform to the conical shape of the frame.



DETAILS OF ROOF OF OVERFLOW TOWER.

At the point where the main tower begins to decrease in size is a cornice containing a gutter cut in the stonework. On each side of this cornice are two large gargoyles, each cut from one stone measuring 12in. by 18in. on the face and 6ft. 8in. long. There are eight gargoyles set in the band-course in the octagonal portion of the tower at an elevation of about 135ft. above the ground. There is also a large gargoyle on the corner of the balconies set at the level of the floor.

The roof of the main tower is supported by three main trusses which intersect each other and are built up of steel angles carrying purlins of 2in. by 2in. by $\frac{3}{16}$in. angles, which are spaced 17in. apart and carry the terracotta roof. This terracotta is of the best quality, hard burned and semi-glazed and of a pure and uniform white colour. It was all laid out and each course carefully fitted and numbered before leaving the shop, and a setting plan was furnished to correspond. Each piece was separately wired to the ironwork with copper wire in such a manner as to be rigid and secure. The joints average $\frac{1}{4}$in. in thickness and are filled with cement mortar. At the top of the roof is a copper finial about 7ft. high, through which a flagpole passes. The base of the finial contains an opening providing access to the roof. A steel stairway and ladder commences at a point about 10ft. above the bottom of the roof truss and continues to the apex of the roof on the inside, where it is riveted to the flagpole mast. The flagpole is made up of four sections of straight grain white hickory, jointed together with bronze sockets. The flagpole mast consists of 4in. and 6in. gas-pipe extending down in the roof of the tower about 15ft. and securely fastened to the roof trusses. At the bottom of the roof is a copper cornice.

The top 35ft. of the overflow tower, including the 20ft. of roof, is of cut white limestone. The portion below the roof contains a number of portholes closed with copper wire screens, with a 1in. mesh, set on the inside and anchored to the walls. The stonework in the roof was cut to specific dimensions, and the finial was cut from one solid stone. Passing through the finial is a $1\frac{1}{4}$in. iron rod, which continues down the centre of the roof and connects with an iron spider. This is bolted to a cast-iron band piece under the roof, which is anchored to the sides of the tower, thus securing the roof to the tower.

All angles and plates of roof trusses above the observatory floor, including the purlin and rafter angles, are of soft steel. The shop rivets are of soft steel and the field rivets are of charcoal iron. The remainder of the steel used in the tower is of a soft or medium grade. All visible interior ironwork from the first floor to the observatory floor and the spiral stairway, ladder, &c., below the ceiling of the overflow tower were coated with pure white lead mixed with linseed oil. All of this work was finished in a pale green colour, except the cast-iron floors, stair treads, risers, and hand railings, which were made a dark green colour. The exterior ironwork and the wooden flagpole were painted with white lead. The tower is wired for both arc and incandescent lights, twelve of the former being located at the observatory floor. This tower was designed while Mr. M. L. Holman, M.Am.Soc.C.E., was water commissioner of St. Louis with Mr. S. Bent Russell, M.Am.Soc.C.E , principal assistant engineer in charge of the work then as now. The present water commissioner is Mr. Edward Flad, M.Am.Soc.C.E.—*The Engineering Record.*

* * *

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XII.

The general principles governing the designing of cantilever bridges having been fully enunciated and investigated, it remains to apply them to the example we have selected. It will be necessary therefore, while availing ourselves of the theoretical rules and other information at our command, to substitute the actual values in units of weights for the loads acting upon the truss, in order to determine the stresses in similar units, that is to say in tons, upon the various members. These data having been accurately ascertained, the practical part of the design, or the construction of it, can be proceeded with. This includes the adoption of the best forms of the most suitable sections for the various parts, and of the most skilful methods of uniting them to one another. A large part of this indispensable knowledge cannot be acquired altogether from books, nor even from working drawings, however complete and finished they may be. There are numerous girders and trusses erected in and about the Metropolis where design and construction can be closely studied from a vantage point by any interested outsider. A student and beginner, who is possibly puzzling his brains over the necessity for counterbracing trusses and over the law governing the cumulative nature of the stresses, will find himself much more familiar with them after carefully inspecting a good example in actual working order. An excellent, though by no means a particularly handsome or pleasing, specimen of a large, well-built, polygonally-trussed girder 175ft. in span is that forming the middle span of the temporary Vauxhall Bridge over the Thames. It is not too much to assert that any wayfarer crossing the bridge could easily, if so disposed, count nearly every rivet in the structure.

Commencing, therefore, with the dead, or uniformly-distributed loading, the first thing for the student and beginner to do is to obtain, by carefully studying the half elevation of the truss in Fig. 1, a good general idea of the manner in which the separate weights W_1, W_2, and W_3, each of which is equal to five tons, are conveyed to the abutment. Secondly he must pay attention to the manner in which the transfer of these weights affects the different members of the truss, and the character and amount of the stresses they bring upon them. In order to be an efficient designer of bridges, roofs, and iron and steel structures of any of the numerous forms in which they appear, the professional man must thoroughly understand what may be appropriately termed the "anatomy of all descriptions of girders, trusses, and metallic erections."

None of the so-called short or royal roads to knowledge, such as purely analytical investigations, or stress diagrams, will give this particular information required. They furnish, it is true, with all the accuracy required for practical purposes, the total *results*—that is, the total stresses induced by the weights upon all the individual parts of the structure ; but at the same time they afford little or no clue to the process by which these stresses are cumulatively arrived at. As an example in point, take the well-known formula—

$$S = \frac{W \times L}{8 \times D}$$

This equation, substituting the proper values for the respective symbols, gives the total stress upon the centre of either the upper and lower flanges of any truss or girder similarly designed to that in the figure. But it affords not the slightest information respecting the manner in which this ultimate stress is arrived at, nor how it is obtained by the successive increments of stress, due to the repeated thrusts and pulls of the diagonal bars in the web.

FIG. 1

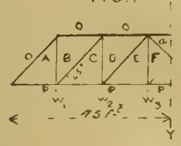


FIG 2

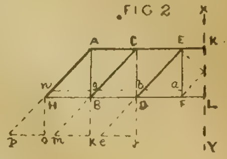
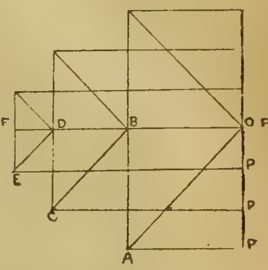


FIG. 3.



The graphic method, known as the "resolution of forces at the different joints," determines the individual as well as the ultimate or cumulative stresses, and, in addition, indicates minutely and precisely the effect of each member of the truss upon its neighbours. It shows the relationship existing between them and how they are mutually dependent upon one another, and how failure may occur when the design is defective and inadequate to perform its duty. Referring to Fig. 2, which is a *facsimile* of Fig. 1 with the lettering and other details omitted in order to show the application of the method of resolution, there are dead weights of five tons each upon the lower flange situated at the lower apices B, D, and F. Commencing with that on E F, it is under the conditions of a uniformly-distributed load, all transferred to the left abutment H. It is the first instance wholly taken up by the vertical tie-bar E F, upon which it brings a tensile stress equal to its own weight of five tons. At the apex E, this stress is resolved into two others, one in the direction of E K, and the other in that of the diagonal bar D E. To ascertain their amount. plot off to any convenient scale E *a*, equal to five tons, and draw *a b* parallel to the upper flange to meet the bar D E at the point *b*. Then *a b*, measured on the same scale, will give the stress upon E K, and E *b* that upon D E. There is one more detail necessary to be known respecting the stresses E *a* and E *b*, and that is their sense—that is, are they plus or minus. Upon referring to the point E, where the tensile stress E *a* directly acts, it will be seen that it tends to pull the members D E and E K lower down, or, in other words, to shorten them or double them up. They will, therefore, both be in compression, or of a plus character.

It is evident that we shall not have done with the action of the weight at F until it is finally transferred to the left abutment, which will be partly effected by means of the stress E *b* which it has brought upon the diagonal bar D E. Produce the bar D E to *e*, and the vertical C D to *f*; make D *e* equal to E B, draw *e f* parallel to the bottom flange, and D *f* will represent the stress upon the vertical C D, and *e f* that upon the part of the lower flange D F and F L. If we trace the line of action of the stress E *b* upon the two members D F and C D, it will be seen that it tends to push them in the direction of the prolongation of the diagonal D E towards *e*, or to stretch them. Consequently the stresses upon D F, F L, and C D are all of a tensile or minus character. Following out the operation, the stress upon the vertical C D is transferred to the apex C, where it obviously compresses C E, E K, and C B to the extent measured by the lines *b g* and C *g*. By prolonging the diagonal B C to *m* and the vertical A B to K, and drawing *m k*, we obtain the stresses upon A B, and upon B D, D F, and F L, all of a tensile nature. Plotting off by similar repetition A*g* upon the vertical A B, and drawing the horizontal line *g n*, we obtain the stress upon the members of the upper flange A C, C E, and E K. If we prolong the last diagonal strut A H to *p*, and draw *p o* to meet the perpendicular H*o*, the line *p o* gives the stress upon H B, and also aditional stresses of the same intensity upon B D, D F, and F L. It should be observed that the line H *o* represents the vertical reaction, and should equal the weight placed at F, which is proved by the fact that H *o* equals to E *a*, which is equal to the weight placed at F of five tons. It will appear from the foregoing investigation that, while the weight at F does not effect, for the present calculations, any of the diagonal bars to the right of it, it does effect the member of the flange in the same direction. This action of the separate weights at the remaining lower apices D and B will be more appreciable when their influence is investigated. Combining the three weights placed at the points F D and B on the lower flange, their joint action is cumulative on the two flanges towards the centre, and cumulative on the diagonal bars of the web towards the abutment. Since under the conditions of a uniform load the stresses upon the diagonal bars of the web—excepting the counterbraces in the central panel, upon which they are equal to zero—are the same for the other half of the truss, it is not difficult to tabulate the stresses upon the different members of the whole girder. Each of the weights at D and B are cumulative stresses upon the parts of the flanges C E, E K, and A C, C E, and E K, and upon the diagonal bars C B and A H respectively.

In Table I., the stress obtained from the summation of the stresses in the diagram in Fig. 2 upon the last diagonal bars is 21·21 tons. To check this result, putting S to equal the compressive stress upon each terminal bar, the equation becomes—

$$S = R \times \text{cosec. } \theta,$$

from which, since R = 15 tons, and θ = 45°—

$$S = 15 \times 1{\cdot}414 = 21\ 22,$$

or practically the same amount as that given by the computation resulting from the use of the diagram of the resolution of forces at the joints of the truss. It remains now to ascertain the stresses upon the different members of the flanges. Altogether there are six cumulative stresses upon the central members of the upper and lower flanges E K and F L. Of these six, three, as shown in the diagram, are due to the action of the weight at F, two to that at D, and one to that at B. In Table II. the stresses upon the different members of the upper and lower flanges are recorded. The same letters are used for both halves of the truss, but those on the right half are distinguished by a small mark at the foot of each letter. Thus $D_1 B_1$ on the right half corresponds to B D on the left, and in the upper flange EK_1 KE_1 constitute one and the same part. and so do F L and LF_1 in the lower flange. For the maximum stress upon the central panel length of each flange, we obtain 30 tons, and the result can be checked and verified by the application to the problem of the formula—

$$S = \frac{W \times L}{8 \times D},$$

in which W = 30 tons, L = 90ft., and D = 13ft. Substituting these values for the symbols, we have

$$S = \frac{30 \times 90}{8 \times 13} = 25{\cdot}9 \text{ tons.}$$

There is evidently a discrepancy between these two methods, to which careful attention should be paid, and the reason sought for. It will be found that the discrepancy is due to the fact that the conditions in the two instances of the pure analytical investigation and the graphical method are by no means identical. In the former, the total load is assumed to be uniformly distributed over the whole span of the truss, whereas in the latter it is divided and placed at the six lower apices of the bottom flange. A much closer approximation to the result to be obtained, which is common to both methods, will be brought about if the conditions governing the analytical investigation be applied to the graphic solution. In Figs. 1 and 2 the total load of 30 tons upon the truss is assumed to be divided into six parts of 5 tons each, placed upon the lower flange at the intersection with it of the vertical and diagonal members of the web. But if the total weight be regarded as uniformly distributed over the whole span, it will be at once apparent that the weight upon the half of each of the end panels, H B and $B_1 H_1$, must be considered to be directly supported by the nearest abutment, or, what is tantamount to the same thing, one of the weights of five tons produces, under these conditions, no stresses upon any of the members of the truss. It may, therefore, be deducted from the total amount of 30 tons, which leaves 25 tons to be dealt with, and the value of each of the weights W will no longer be 5 tons, but something less, as follows :—

Table I.—Bars of the Web.

O A	A B	B C	C D	D E	E F	F G	G H	H K	K L	L M	M N	N O
+	–	+	–	+	–		–	+	–	+	–	+
21·21	15·00	14·14	10·00	7·07	5·00	0·00	5·00	7·07	10·00	14·14	15·00	21·21

Table II.—Parts of Upper Flange.

+	+	+	+	+	+
A C	C E	E K	K E	$E_1 C_1$	$C_1 A_1$
15	25	30	30	25	15

Parts of Lower Flange.

H B	B D	D F	F L	LF_1	$F_1 D_1$	$D_1 B_1$	$B_1 H$
–	–	–	–	–	–	–	–
15	25	30	30	30	30	25	15

$$W = \frac{25}{6} = 4{\cdot}1\dot{6} \text{ tons,}$$

Consequently, the stress S upon the flanges of the upper and lower central panels can be readily ascertained by a simple summation thus :—

$$S = 6 \times 4{\cdot}1\dot{6} = 25 \text{ tons,}$$

which result agrees practically with that calculated by the formula. It should be observed here that the shorter the panel lengths—that is, the greater the number of the subdivisions of the total load and the points of their application to the truss, the closer will be the agreement between the results of the analytical and the graphical method—in many instances to one or two decimal places.

The stress diagram in Fig. 3 is another method by which the stresses due to a uniformly-distributed load upon a girder can be readily calculated. If in the lower half of the diagram—for there is no need of carrying out the process in the upper half as well, although it is drawn to render the illustration of the method complete—the distances O P – P, P – P, and P – P be made each equal to five tons, the stresses upon the different members of the truss will be equal to the length of the respective lines. Each line representing a stress is distinguished by the same letters as indicated in the semi-skeleton elevation of the truss in Fig. 1, thus showing the accuracy and convenience of Bow's system of lettering. The cumulative stresses upon the various parts of the truss are also exceedingly well shown by the varying length of the several lines corresponding to them. In order to check the general correctness of the diagram in principle, its reciprocity to the frame diagram in Figs. 1 and 2 may be tested. Take, for instance, the panel crossed by the diagonal D E—that is, the first next to the central panel. Commencing with the upper half of the panel, it will be seen that the members C D, D O, and D E form a triangle, and thus inclose a space. According to the rule of reciprocity laid down, they ought, therefore, in the stress diagram in Fig. 3 to all meet at the same point. These conditions are fulfilled at the point D in the figure, where all these lines meet, and the same result will attend similar comparisons with respect to the lines representing the other members of the truss in Fig. 1 and the stresses upon them in Fig. 3.

The "method of moments" or "method of sections," as it is also termed, can be applied to determine the stresses upon the truss under consideration. Let it be required to find by this method the stress on the last panel length B O of the upper flange of the truss in Figs. 1 and 2. Taking the moments about the point B in Fig. 2, the lever-arm of B O is equal to A B, and that of the reaction of the abutment is A P, so that equating these two moments, we obtain the expression, calling B O the stress upon part of the upper flange required—

$$BO \times AB = R \times AP$$

But since $\dot{A}B = AP$, or the depth of the girder equals the length of a panel, the formula is—

$$BO = \frac{15 \times 13}{13} = 15 \text{ tons,}$$

as already found by the other modes of calculation. One more example may be taken—that of the stress upon the diagonal bar A O in Fig. 1. Selecting the lower apex of the vertical A B as the origin for the moments, and dropping a perpendicular to A O upon the point, we have for the stress upon the bar A O—

$$AO \times 9 = R \times AP.$$

Making similar substitutions as in the last example, we find—

$$AO = \frac{15 \times 13}{9} = 21{\cdot}\dot{6} \text{ tons.}$$

There is one important detail to be borne in mind when using the method of sections, and that is that when taking the moment of any one member of the truss about another, the point chosen for the application of the lever arms may be located anywhere except where the two lines representing members intersect one another.

In our next article, the shearing, longitudinal, and diagonal stresses, due to the action of a moving load, will be investigated, which will enable the practical designing of the truss to be proceeded with.

THE SANITARY CONGRESS AT SOUTHAMPTON.

We resume and conclude, from p. 259 in our last issue, our report of the very successful congress held at Southampton last week by the Sanitary Institute, taking up the thread of the narrative with the proceedings of Thursday, when work was carried on in three sections, devoted respectively to Sanitary Science, Engineering and Architecture, and Physics, Chemistry, and Biology.

SANITARY SCIENCE AND PREVENTIVE MEDICINE.

This section was presided over by Sir Joseph Ewart, who remarked that of the many scientific developments which had characterised the greater part of the century now drawing to a close there were few more important than those which had been designed to raise the standard of the public health. The provision of pure water, efficient drainage of streets and houses, improved houses, the constant supply of fresh and the removal of foul air, and the widespread application of the principles of sanitary science and preventive medicine might be cited. Splendid results had already been attained in diminished mortality and sickness as a result of these and other modern reforms. He urged upon his hearers the vastness of the triumphs which have been achieved by vaccinators, sanitarians, and sanitary engineers in the advancement of health in modern days, and particularly since the Vaccination and Public Health Acts were passed in 1841 and 1876. In the lifetime of many typhus had been all but extinguished; a hale, hearty, and enjoyable old age had been much lengthened, and malarial fever at home at least had been marvellously curtailed. It was gratifying in spite of all the increasing consumption of drink going on that homicidal people are a diminishing quantity. There was room for more decrease. It was to b regretted that all our sanitation and preventio have made so small an impression on measles and diphtheria.

THE WATER SUPPLY AND OVERCROWDING PROBLEMS.

Presiding in the Engineering and Architectur Section, Mr. Jas. Lemon, F.R.I.B.A., M.I.C.E. (past-president of the Association of Municipa and County Engineers) dealt with the question o pure water. He said that the old storage system with its abominations, had been swept away, and the householder knew that if the water was not pure it arose from the source of supply an defective distribution. There was no difficulty in this country in obtaining a supply of water, and one of his predecessors in that chair, Mr. Lewis Angell, in his address in 1879, stated that it was sufficient for twenty times the then population; but the raising of the standard of purity had led to a scramble for a better source. Birmingham had gone to Wales, and the London County Council wished to follow their example. How far this race from one part of the kingdom to the other on the part of wealthy Corporations should be permitted was a matter for the serious consideration of Parliament. It might be desirous to allocate the areas of supply to certain districts, so that it might not become a question of "first come, first served," and the longest purse. He dealt also with the question of sewage disposal and the provision of healthy dwellings. Overcrowding was the chief social problem of the age; but he did not think it would be solved by erecting large blocks of building in the centres of industry, and crowding the poor together on the same area. He mentioned that the Corporation of Southampton was carrying out an improvement scheme. The area was about $2\frac{3}{4}$ acres, the claims of the owners amounted to £40,000, the costs, including solicitors' and surveyor's charges, was about £32,000, so that the cost of the land which the Corporation had acquired was about £11,600 per acre. The effect of that was the municipal lodging-houses and the workmen's dwellings would be a loss to the town if they threw upon them the cost of the site. He was afraid the outlay would damp the ardour of the sanitary reformers, and it would be some time before the Corporation of Southampton will carry out a second improvement scheme. If that were an isolated case, it would not matter, but, unfortunately, the municipal authorities of other towns who have been engaged upon this work had had a similar experience. The architect was thus handicapped at the start, as he could not design workmen's dwellings which would repay the capital and pay the interest and working expenses, plus this abnormal heavy ground rent. Then what was the remedy? One would be the erection of workmen's dwellings in suburbs served by tramways or light railways.

HOSPITAL CONSTRUCTION AND PLENUM VENTILATION.

"The developments in hospital planning and construction, resulting from the employment of plenum ventilation," was the subject treated by Mr. William Henman, F.R.I.B.A., of Birmingham. The plenum system, he pointed out, was the propulsion of air for hospital purposes, and when this means of ventilation was employed the air could be cleansed, tempered, and brought to a suitable hygrometic condition without the necessity for having apparatus of any kind in the habitable parts of the buildings. Unpleasant draughts were avoided, and the effectiveness of appliances for changing the air was fully utilised. Several years of experience in hospitals, asylums, schools, and other buildings had demonstrated that with an efficient means of securing ventilation on the plenum system window-opening could, with actual advantage, be dispensed with. Further developments of the system were now being tried, which would provide for a supply of cleansed and tempered air, equal to a change of air ten times per hour night and day throughout the buildings. On looking back to the opposition from many sources which faced him six years ago, when it became known that the General Hospital at Birmingham was to be ventilated on the plenum system, and calling to mind the many "high authorities" who, having predicted failure, were now all ready to realise it as an acknowledged success, he could not suppose that the bolder step would meet with unqualified approval, and although he would not presume to say that absolute perfection would be obtained, he felt thoroughly justified in making the attempt.

THE STORAGE OF FLOOD WATER.

Professor Henry Robinson read a paper on the storage of flood water, and said the better conservation of the rainfall was a national question, as the population increased but the water available for their requirements did not increase, and every year there arose a struggle for watersheds from which to obtain the supply for large towns, while the populations in villages too often depended upon shallow wells, which were liable to pollution. There was a grave need of well-considered and comprehensive treatment of watersheds, so that flood waters should be stored, thus rendering the flow of rivers more equable, and the excess water, which now did mischief by causing floods, would be available for domestic supply, irrigation, improving navigation in rivers and canals, &c. The initial difficulty, however, was the cost.

THE VALUE OF BACTERIAL EXAMINATION.

Professor Percy Frankland, in opening Section III., said that England was well to the fore in practical sanitation, but was behind in sanitary science. He contrasted the amount of money expended on national defence and on hygienic education, and said that the progress of science was quite as important for commercial reasons as was national defence. He referred at length to the Blue Books on sanitary science, which dealt with the substitution of water-gas for coal-gas, the use of lead in potteries, and of phosphorus in matches, and said he was in favour of the recommendations of the committee. In regard to phosphorus it was the obvious duty of everyone to abandon such matches, and on this point he especially appealed to smokers. He next dealt with the application of bacteriology to sanitary science, and with regard to the bacteriological analysis of water he pointed out that the old idea that the bacteriologist was going to determine whether the condition of water was likely to cause disease or not was completely exploded, the real value of bacteriological examination of water lying in the assistance which it rendered in controlling and checking the filtration and purification of water. There was no new principle in the bacteriological treatment of sewage, for it had been going on on the same lines for years without being recognised. Sewage purification was a fermenting industry, just as brewing was, but with this distinction—that, whereas brewing was one of the most remunerative of industries, there was no hope of sewage purification being carried on at a profit.

VENTILATION FOR CROWDED BUILDINGS AND HOSPITALS.

The closing sittings of the Congress were held on Friday.

Dr. Thomas Glover Lyon read a paper on "Ventilation for Crowded Buildings and Consumption Hospitals, with special reference to the new method of distribution and removal of air." He stated that his object was to lay before the Congress methods of supplying air to rooms where there was such an aggregation of people as to render some method of forced ventilation necessary in such places as concert-rooms, public theatres, churches, dining-rooms, saloons of ships, and railway cars. It was usually considered that each person at a theatre should be supplied with at least 1,000ft. of air an hour. At the Opera House at Vienna the figure was 1,600ft. The necessity of mechanical ventilation in the case of crowded rooms, and the impotence of natural ventilation, was shown by Dr. Barwise at the Congress last year, and he also demonstrated how the extra expenses entailed in supplying the extra purity of air was simply repaid by extra output in the case of workshops, and extra grant in the case of schools. The gain by introducing good ventilation in offices where clerks were crowded together would doubtless be even more marked. Whilst agreeing with Dr. Barwise and most authorities on the superiority of the plenum over the vacuum system, he would insist on the great value of using both systems together—that was, of blowing in air at inlets and exhausting it from outlets. Not only by this means was the air in rooms kept at nearly atmospheric pressure, but the necessity of making the building or rooms air-tight was dispensed with. Touching upon the question of erecting sanatoria for consumptives in England, he expressed the opinion that very good results might be obtained by treating consumptives in England. The pursuit of open-air treatment in our climate necessitated exposure to great discomfort, and it seemed to him that this could be avoided by adopting such a method of ventilation as he had described. In every sanitorium a large hall might be provided, plentifully supplied with filtered air, free from fog, and warmed to the temperature desired. Patients, in the event of inclement weather, might sit about or exercise themselves in the hall; in which, also, they might at times take meals in comfort, instead of being, in certain seasons of the year, embarrassed with thick garments, and exposed to a cold, raw atmosphere. At the present moment owners of theatres, concert-rooms, restaurants, &c., were granted licenses without any stipulation being made for a supply of fresh air. Yet most places of public resort were notoriously in such a condition as regarded ventilation that they were active agents in the production of disease, especially of chest affections, including consumption. Keenness of competition appeared to paralyse all private efforts to remedy the present state of things, and he believed nothing but the interference of the Legislature, or the action of local bodies, would meet the exigencies of the case.

IS SEWER VENTILATION UNNECESSARY?

In the Engineering and Architecture Section, Dr. D. S. Davies, medical officer of health, Bristol, in discussing the question whether the ventilation of sewers is necessary, said that in Bristol the sewers were totally unventilated, and had been so ever since they were constructed. He quoted statistics, gathered from mortality returns, to show that Bristol was more healthy than many towns where the sewers were ventilated.

Mr. W. Kaye Parry, of Dublin, read a paper on sewage purification without filtration.

At the concluding general meeting it was shown that the attendance had been upwards of 2,000, and the number of papers read 79, with twelve Presidential and introductory addresses, and it was announced that the meeting of next year will be held at Nottingham.

CHIPS.

The Board of Trade have appointed Sir Frederick Bramwell as the arbitrator to decide the amount to be paid by the Corporation of Wolverhampton for the purchase of the tramways within the borough.

Mr. Thomas Nolan has been elected to the chair of architecture recently established at the University of Missouri, Columbia. He was born in 1857, and is a former student in the Atelier Daumer, Ecole des Beaux Arts. His work includes, among other large buildings, the Chamber of Commerce at Rochester, N.Y.

A new hall in connection with Cathcart Free Church, Glasgow, was opened on Thursday in last week. The new building is situated in Newlands-road. It is built of Locharbriggs stone, the roofs being finished with Aberfoyle green slates and red tiles, and the internal wood-work is of stained silver grey. There is movable seating accommodation for 370 persons.

The R.C. Church of St. Francis, at Handsworth, Birmingham, was reopened on Sunday, after decoration of the nave and aisles by Mr. Jeffrey Hopkins, of Worcester, who three years ago carried out similar work in the chancel and Lady-chapel of the same church.

A new organ built by Messrs. Richardson and Sons, Manchester, for the Congregational Church, Adlington, near Chorley, was opened on Thursday in last week.

The rebuilding of the Colston Hall at Bristol will shortly be commenced. The directors of the company, at their last meeting, considered and approved the revised plans. Mr. A. J. Beaven's original tender amounting to about £30,000 being far in excess of what the directors were prepared to spend, the plans had to be remodelled, with the result that the contractor's tender was reduced to £21,300, which was accepted by the directors. The works are to be completed within twelve months.

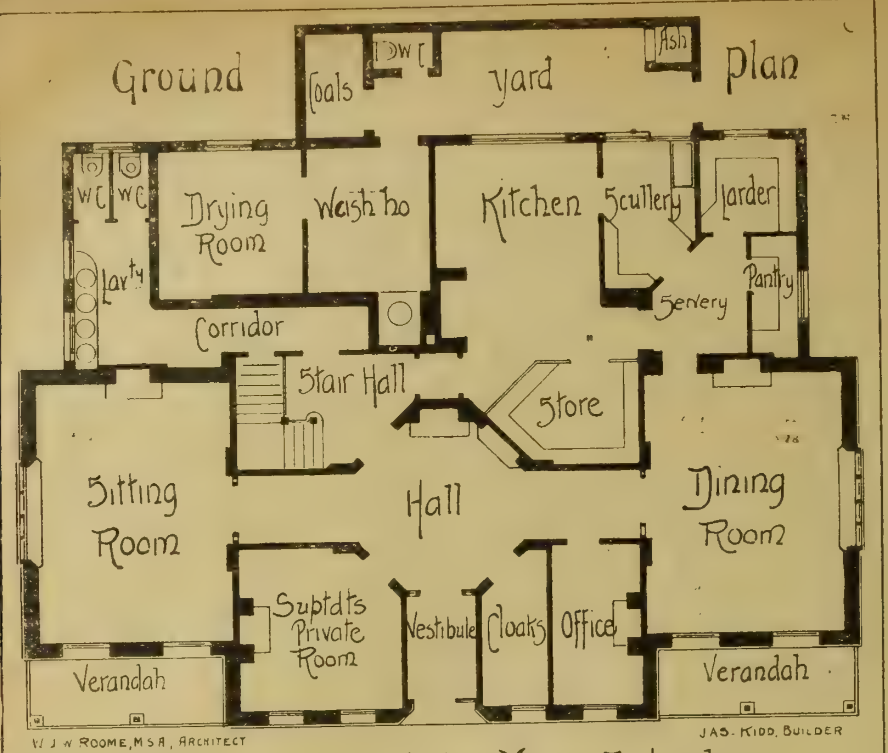
Colonel Slacke, R.E., held an inquiry on Friday at Crewe into an application by the town council to borrow £5,459 for works of street improvement and sewerage. The Mayor, town clerk, and borough surveyor explained the works.

In the case of John Henry Smith, of Worksop, Notts, builder, the order of discharge has been suspended for three years, ending July 13, 1902.

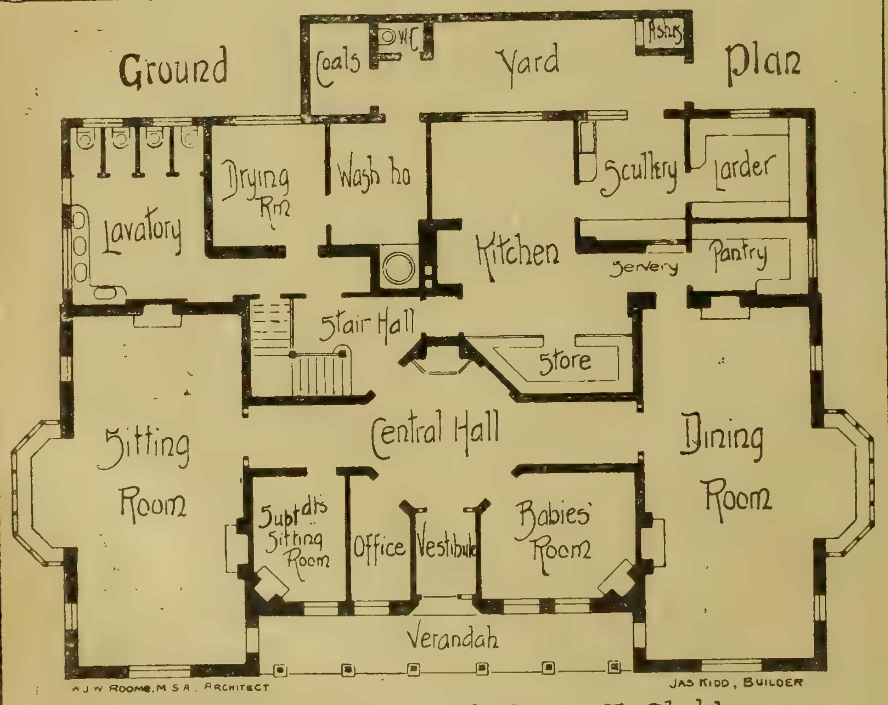
During some excavations which have recently been made in the vicinity of Lincoln's Inn Hall, in connection with the complete relaying of the drainage there, several fragments of old pottery, consisting of jars, candlesticks, &c., a small green glass bottle, and a large bronze medal, were discovered some distance from the surface of the ground by the workmen.

Mr. W. E. Willink, M.A. (Cantab), A.R.I.B.A., the president of the Liverpool Architectural Society, who has for some years been a councillor in the corporation of that city, was on Wednesday raised to the aldermanic bench, to fill a vacancy caused by retirement. Mr. Willink has rendered Liverpool excellent service in all questions affecting the public libraries and art gallery, and the threatened demolition of St. George's Church spire.

Mr. Percy Beckley has been appointed surveyor to the urban district council of Brierley Hill, at a salary of £150 a year.



Home of Rest for Men & Lads.



Home of Rest for Mothers & Children.

HOMES OF REST, BANGOR, CO. DOWN.

THE building known as "The Rest for Girls" at Bangor has proved such a success that the committee decided upon erecting two similar homes, one for men and lads, and the other for mothers and children.

Regarding the Home for Men and Lads, which has cost about £1,900, the exterior is red brick, and roughcast on the upper part of the building. There are large windows, and bays have been provided to obtain views around. Entering the vestibule, there is a large octagonal hall leading to the main departments, and with an open grate at the opposite end of the vestibule, giving an opportunity for heating during the colder weather. On the right are cloakrooms, superintendent's office, and a large dining-room. From the dining-room there are French casements and a covered verandah. The servery leads from the dining-room to the kitchen and domestic offices. On the opposite wing of the central hall there is a corresponding apartment for the general sitting-room, with a bay commanding a very extensive view. The upper floors are fitted up with a number of bedrooms, some single and others double. Ample bathroom and lavatory accommodation has been provided on each floor. The design for the Home of Rest for Mothers and Children is based on a similar plan, but to a somewhat larger scale, the main sitting-room and dining-room being each about 35ft. long by 17ft. wide, and with large bays. In addition, a special feature of this building is an upper verandah, especially adapted for mothers with children in arms. The verandah opening from these bedrooms gives a large and quiet space for sitting and resting in the open air. These new homes have cost some £5,000 for building and furnishing. They were opened in July last. We may here add that the weekly terms charged for sojourning in the two new homes are as follows:—2s. for a child under three years, 3s. under six years, 4s. under twelve years, while for a lad the amount is 5s. per week, for men 7s., and for a mother with a baby the same amount. In the Girls' Home the charge is 5s. per week. Mr. William J. W. Roome, M.S.A., is the architect. The builder is Mr. James Kidd.

OBITUARY.

Mr. Horace A. Alexander, architect, late of 72, Cannon-street, E.C., one of the representatives of the Ward of Walbrook, City, died at his residence, North Park, Eltham, on Monday, after a long illness. Mr. Alexander, who had just attained his 61st year, retired from the practice of his profession twelve months ago. He was elected a Common Councilman in 1888, and was also a liveryman of the Spectaclemakers' Company.

Mr. Joseph Fogerty, architect and engineer, died on Saturday last at his residence, Enderby, Sydenham, S.E., aged 67 years. He had been a member of the Institution of Civil Engineers for six-and-thirty years, and was at one time an Associate of the Royal Institute of British Architects. Mr. Fogerty, who was of Irish birth, carried out a large amount of work in overhead railways and tramways, both in the United Kingdom and also in Austria and Hungary, and was also the author of several novels.

The celebrated Dutch portrait painter, David Bles, died in The Hague on Monday. He was born on September 21, 1821, and studied under Cornelis Kruseman in Paris. At an early age he visited England and Belgium, and his works at the Universal Exhibition at Paris in 1855, and at the Exhibition of 1878, attracted considerable attention. A large number of his paintings are to be found in England and America. One of his latest productions was a life-size portrait of the young Queen of Holland.

PROFESSIONAL AND TRADE SOCIETIES.

The Architectural Association of Ireland.—A party of the members of this association visited Powerscourt House, Enniskerry, on Saturday last. The party was received by Lord Powerscourt, who conducted them over the Georgian mansion, the finest of its period in Ireland, and the beautiful grounds and terraces, all of which are of very great interest from an architectural point of view. The fine collection of pictures and other art treasures collected by the present Lord Powerscourt were much admired. The members were subsequently most hospitably entertained by Lord Powerscourt.

National Association of Master House-Painters.—The fifth annual convention of this association will be held in the Shire Hall, Hereford, on Oct. 3, 4, and 5, when a full and varied programme of matters of great interest to the trade will be discussed. Master painters desiring to join the society should apply to the hon. sec., Mr. W. G. Sutherland, 16, Oxford-street, Manchester. Applications from all desirous of attending the convention should reach the secretary by Sept. 20.

The Surveyors' Institution. — The new president, Mr. T. M. Rickman, will entertain the members and their friends at a conversazione, to be held on Oct. 12 and 13, in connection with the formal opening of the new building.

The Secretary for Scotland has sanctioned th Corporation of Aberdeen borrowing an additiona sum of £15,000, in connection with the electric lighting undertaking.

The entire warming and ventilation of Publi Hall, Hartley, Wintroy, was placed in the hands o John King, Limited, engineers, Liverpool, wh recommended that the Hall be fitted with thei well-known "small-tube" hot-water heatin apparatus and special economical coil-heater, an their patent tubular exhaust ventilators, and th work has been carried out with the most satisfactor results.

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ILLUSTRATIONS.

BALTIC CHAMBERS, GLASGOW.—PRINCE OF WALES MANSIONS, CHELSEA.—STUDIES OF WROUGHT IRON WORK.—VILLAS AT EDINBURGH.—"WHITEVALE," DIDSBURY.—JOHN ROBINSON MEMORIAL CHURCH, GAINSBOROUGH.—NORTH CAMBERWELL RADICAL CLUB AND INSTITUTE.—HOMES OF REST, BANGOR, CO. DOWN.

Our Illustrations.

BALTIC CHAMBERS, GLASGOW.

THIS block of buildings has been erected for business premises from plans by Mr. D. McNaughtan, I.A., Glasgow, for a limited company. It consists of six stories, with basement, and occupies a convenient site for business purposes, fronting Wellington-street, Cadogan-street, and Holm-street, and adjacent to the railway termini and exchanges. Entrances are arranged to each of these streets, and ample lift accommodation is provided, there being two passenger-lifts at the Wellington-street entrance, and one in the cross corridor between the other two entrances. There is also a goods entrance at the end of Cadogan-street, with goods lift, and pavement lifts to basement where necessary. One point of the plan is that the corridors are so arranged as to give access to all the rooms directly, thus enabling the company to let offices of any size required. The lighting of the building has been made a special feature, and, in addition to the window-lighting, there is a complete system of electric-lighting, besides gas-piping for fires, &c., where required. The building is of red Dumfries stone. The contractors are as under: — Mason and brickwork, Messrs. Alex. Muir and Sons; joiner work, James Morrison; slater work, A. and D. Mackay; plaster work, D. and J. Mackenzie; plumber work, Fyfe and Allan, Ltd.; painter work, William Douglas; marble and tile work, Galbraith and Winton; electric lifts, Waygood and Co., Ltd.; electric lighting, Claud Hamilton, Ltd. The stone carving was executed by Mr. William Vickers, the wood carving by Mr. John Crawford. The consulting electrician was Mr. William B. Sayers; the measurer, Mr. William H. Dinsmore; the clerk of works, Mr. John Anderson.

PRINCE OF WALES MANSIONS, CHELSEA REACH, S.W.

THESE mansions are now being erected in the Prince of Wales-road, overlooking Battersea Park, the position being the actual site of the old Albert Palace, recently demolished. The buildings comprise ten blocks, having a frontage in all of aubot 700ft.; each block contains ten complete suites of residential chambers, specially designed and planned to suit the neighbourhood's requirements. The construction generally is of a fire-resisting nature throughout, the floors being supported by steel joists surrounded with concrete. The red external facing bricks are specially selected, and the stone used in the the dressings is Bath, from the Corsham Down quarries. Red Broseley tiles form the roofs' covering, and the whole is being ably carried out by the builder, Mr. H. Johnson, of Wood Green, under the superintendence of the architect, Mr. J. A. Gill Knight, A.R.I.B.A., of Godliman-street. Messrs. Charles and Tubbs, surveyors, of Gresham-street, are the agents for the property.

STUDIES IN METALWORK.

THE studies were made with the object of appreciating and realising how the old smith craftsman must have loved his work, and cultivated his sense of beauty and form. The sketches are a selection of as many periods and methods, as well as good application, sufficiently extensive to illustrate the historic period of wrought ironwork. Owing to the reawakening and revival of art handicraft during the latter part of this century, which has no doubt been brought about by the schools of art and museums, a look back into the methods of the old craftsman is very useful and interesting. Especially is this so in ironwork. In the old days, everything had to be wrought, and the appliances at hand were very simple. With a greater technical knowledge and means of production, the arrival of cast and machine-made work was the result. The perfection, however, of production by such methods has not been at all satisfactory, and compares badly with the fresher, more original, and interesting personal work of the art smith. Wrought iron offers, in almost every respect, a material which is far more plastic and, decoratively speaking, effective than cast iron. Looking back over the old forged specimens that are left us—and of which there is such an admirable collection in the Ironwork gallery of the South Kensington Museum—we find some astonishing examples of skill and a fine sense of form and the fitness of wrought iron to its purpose. The accompanying drawings serve their purpose in illustrating truthfully and in detail the methods employed by the old craftsmen; while the notes on them serve to amplify Mr. George T. Easten's excellent bronze medal studies.

VILLAS AT CRAIGHOUSE TERRACE, PLEWLANDS, EDINBURGH.

THESE cottages are built of stone, in a substantial and effective manner, and form part of an extensive scheme of small villa building, from the designs of Messrs. Dunn and Findlay, architects. The plans are almost identical, the differences being shown by the several plans given herewith, on the same sheet as the views. Some houses have three bedrooms, and some only two, a servant's bed-closet being provided in the last-named dwellings next the kitchen on the ground floor. Economy of space and compactness of planning, so essential in dwellings of this class, are distinguishing features in the arrangements herewith illustrated.

"WHITEVALE," DIDSBURY, NEAR MANCHESTER.

THIS residence is situate upon the Ford Bank Estate, five miles south of Manchester. Whilst the situation of the site on the one hand demanded that the entrance should be from the north, the owner's requirements, on the other, led to the whole of the entertaining rooms being placed on the south side, affording them a bright sunny aspect, as well as an excellent view of the tennis-lawn and garden. Our illustration represents the garden-front. The external walls are faced with pressed stock bricks from Ruabon, relieved with terra-cotta and stone dressings. The roofs are covered with selected dark-coloured Broseley tiles. Throughout the house is heated with hot water. The electric-lighting of the house has been intrusted to Messrs. Holmes and Co., of Newcastle-upon-Tyne. The general contractors are Messrs. Burgess and Galt, of Manchester. The work has been executed under the personal supervision of the architect, Mr. Joseph Swarbrick, of Manchester.

JOHN ROBINSON MEMORIAL CHURCH, GAINSBOROUGH.

THIS church is erected as a memorial to John Robinson, the pastor of the Pilgrim Fathers, from the designs of Mr. Ernest R. Sutton, architect, Nottingham. The foundation-stone was laid by the late Hon. T. F. Bayard, the American Ambassador. The building is of red bricks, with Derbyshire stone dressings. The roof has projecting eaves, and covered with Westmoreland slates. A ventilating flèche is placed on the ridge, and is connected with a large shaft extending the whole length of the main roof to carry off the vitiated air from the interior of the building. A gallery for the organ and choir is behind the pulpit, and is approached by a separate staircase. The church accommodates 600 persons. The lecture hall at the rear provides accommodation for 300. Class-rooms are arranged on two sides of the hall for Sunday-school purposes. The contractor is Mr. F. Pattinson, of Rushington.

THE NORTH CAMBERWELL RADICAL CLUB AND INSTITUTE.

(FOR description and further sketches see p. 319.)

HOMES OF REST, BANGOR, CO. DOWN.

(FOR description and sketch plans see p. 298.)

COMPETITIONS.

SHOREDITCH TOWN HALL.—The Town Hall Committee reported at a meeting of the Shoreditch Vestry on Tuesday that they have considered the question of suggesting what arrangements should be made for proceeding with the proposed additions to the Town Hall without further delay. As a result, the committee recommended the vestry to adopt scheme No. 2, which was awarded the first premium in the recent competition, subject to any alterations in the design that might be considered desirable, and to appoint Mr. W. G. Hunt, 12, Bedford Gardens, Kensington, the author of the design in question, to carry out the work on the terms stated in the competition, namely, at a fee of 5 per cent. on the amount of the accepted tender. The vestry adopted the recommendations, and authorised the committee to consult with the architect as to any modifications in the design, and to instruct him to prepare working drawings and specification, with detailed estimate of the cost of the works, for the consideration of the vestry.

CHIPS.

At Holton St. Peter's, Suffolk, the work of the late Rev. R. S. Beloe as parish priest for 40 years has been commemorated by his friends and parishioners in the east window of his old church, which was unveiled by the Bishop of Ipswich on the 26th ult. The window was specially designed and carried out in the late rector's memory by Mr. C. E. Kempe. There are three lights, the centre being our Lord in glory, the right the Blessed Virgin, and the left St. Peter. The whole is conceived in the style of the 15th century.

The Malton Urban District Council on Monday resolved to pass the plans for some new houses on condition that Earl Fitzwilliam's agent gives a strip of land to widen the entrance to York-road, by which he would be giving 150 yards to the town, and receiving 226 yards.

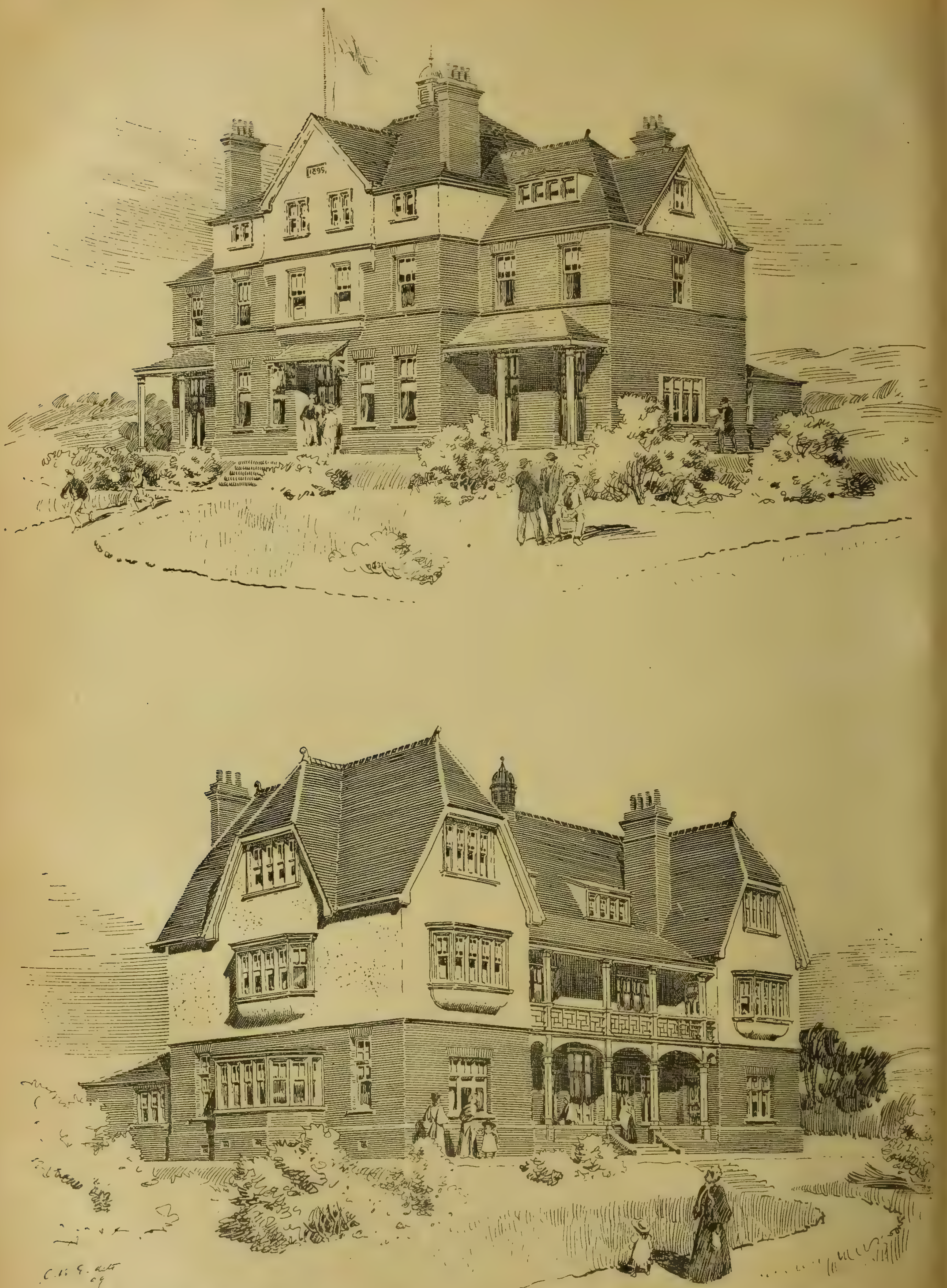
The Grimsby county magistrates gave their decision on Tuesday in the case of Cleethorpes Urban District Council against Messrs. H. Kelly and F. W. Vickers. The respondents had objected to pay their apportionment for the making of Oole-road, Cleethorpes, on the ground that it was not a street within the meaning of the Act, that it was not the proper width, as required by the by-laws, and that although their property was abutting they had not the access they should have thereto. The magistrates dismissed the objection, with costs, but as the chief question has not been settled, they were willing to state a case.

Sir Thomas Lipton has, it is stated, offered the Standard Insurance Company (the mortgagees) £50,000 for the Muckross Estate, Killarney. If his offer is accepted, he will make the estate over to the Irish people.

At a special court of governors of the London Hospital, held on Wednesday, the house governor reported that the work of erecting increased accommodation for the nurses and patients was being rapidly pushed forward. A gift of £10,000 had been received from Mr. Edward Raphael towards the endowment of a new Jewish ward, and another donation of £60,000 had been made by the executors of the late Baroness de Stern towards the establishment of a convalescent home, and it was resolved to buy land within easy reach of the hospital for the purpose at a cost of £10,000, the remaining £50,000 to be allocated for the maintenance of the same.

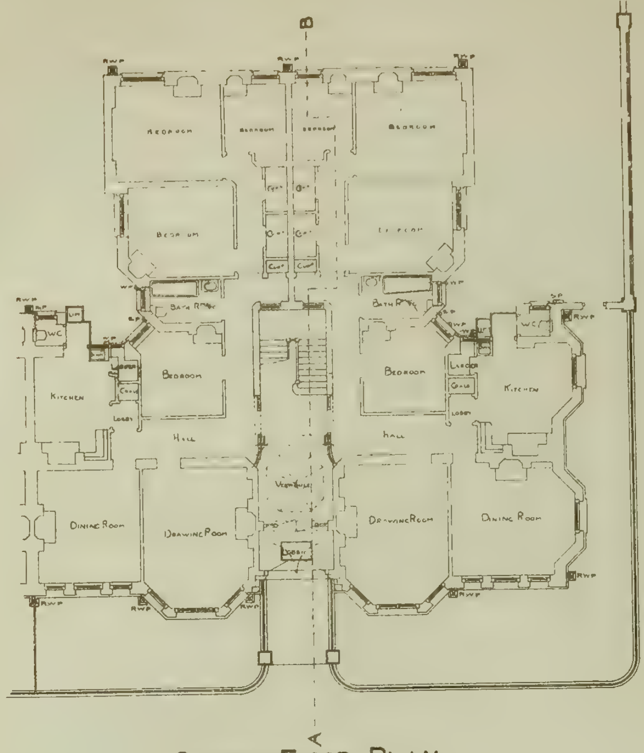
Canon Fleming, preaching in York Minster on Sunday, when the offertory was in aid of the restoration fund, said the fund had reached only about £13,000, although £50,000 at least was required.

The unveiling of two stained-glass windows in the E.U. Church at Airdrie to commemorate the ministry in the church of the Rev. A. M. Wilson from 1851 to 1869, and in memory of two old members, took place on Saturday. The subjects are "Christ as the Good Shepherd," and "Christ as the Light of the World" (after Holman Hunt), and the artist is Mr. Norman M'Dougall, Glasgow.

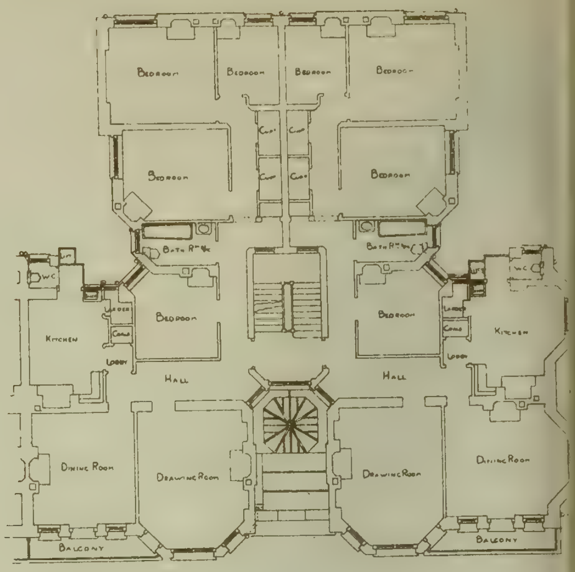


HOMES OF REST, BANGOR, CO. DOWN.—W. J. W. Roome, M.S.A., *Architect*, Belfast.

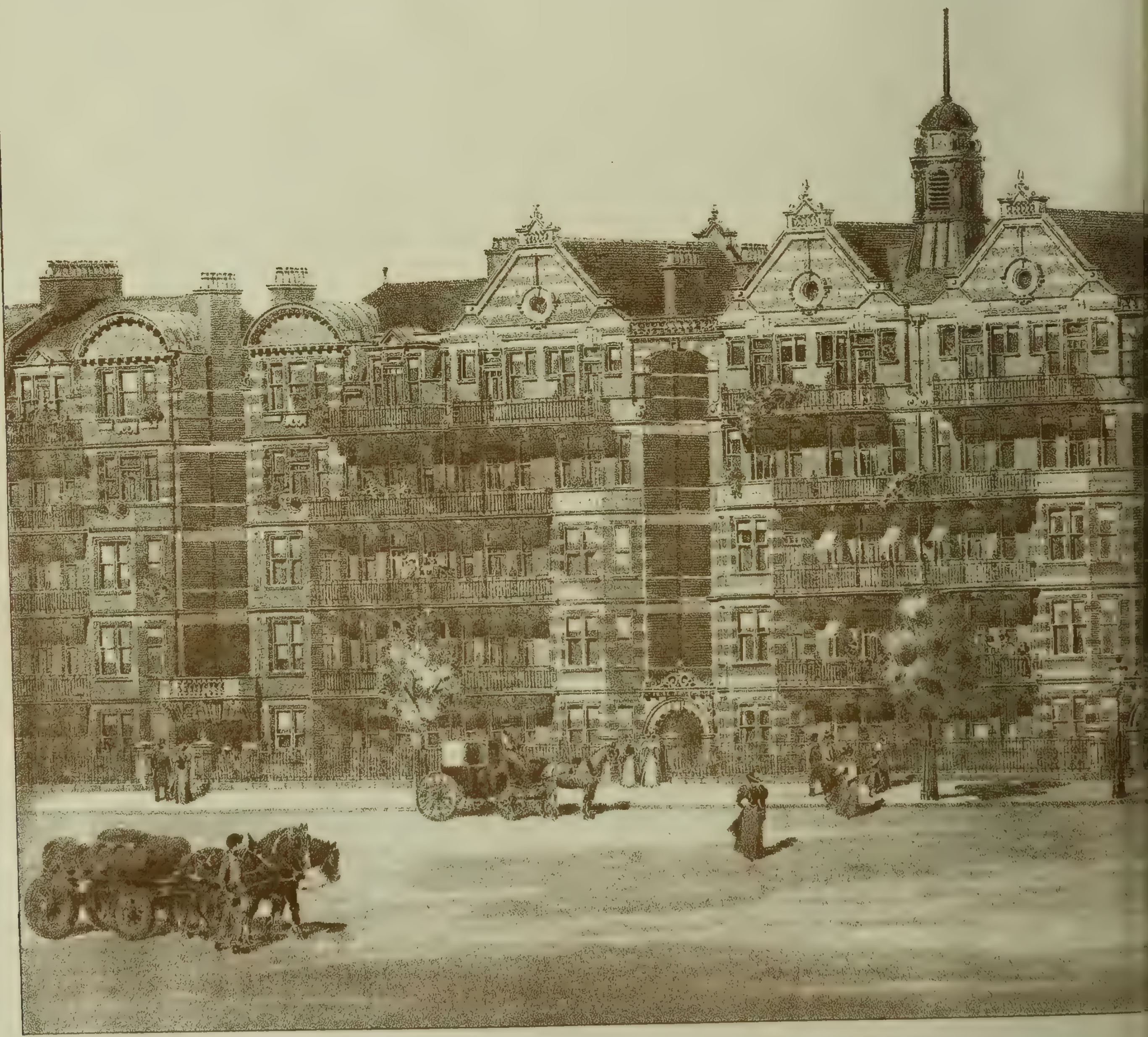
PRINCE OF WALES' MANSIONS



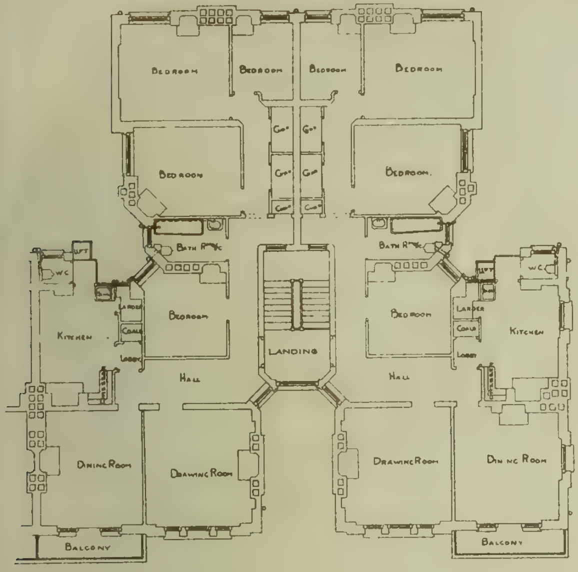
GROUND FLOOR PLAN.



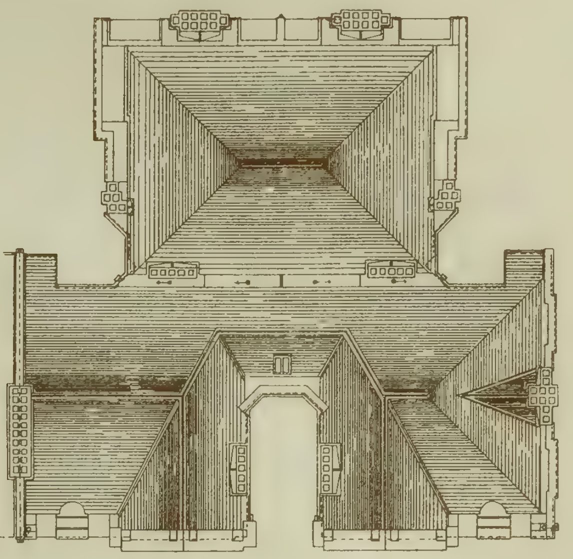
FIRST FLOOR PLAN.



PRINCE OF WALES' ROAD CHELSEA REACH S.W.

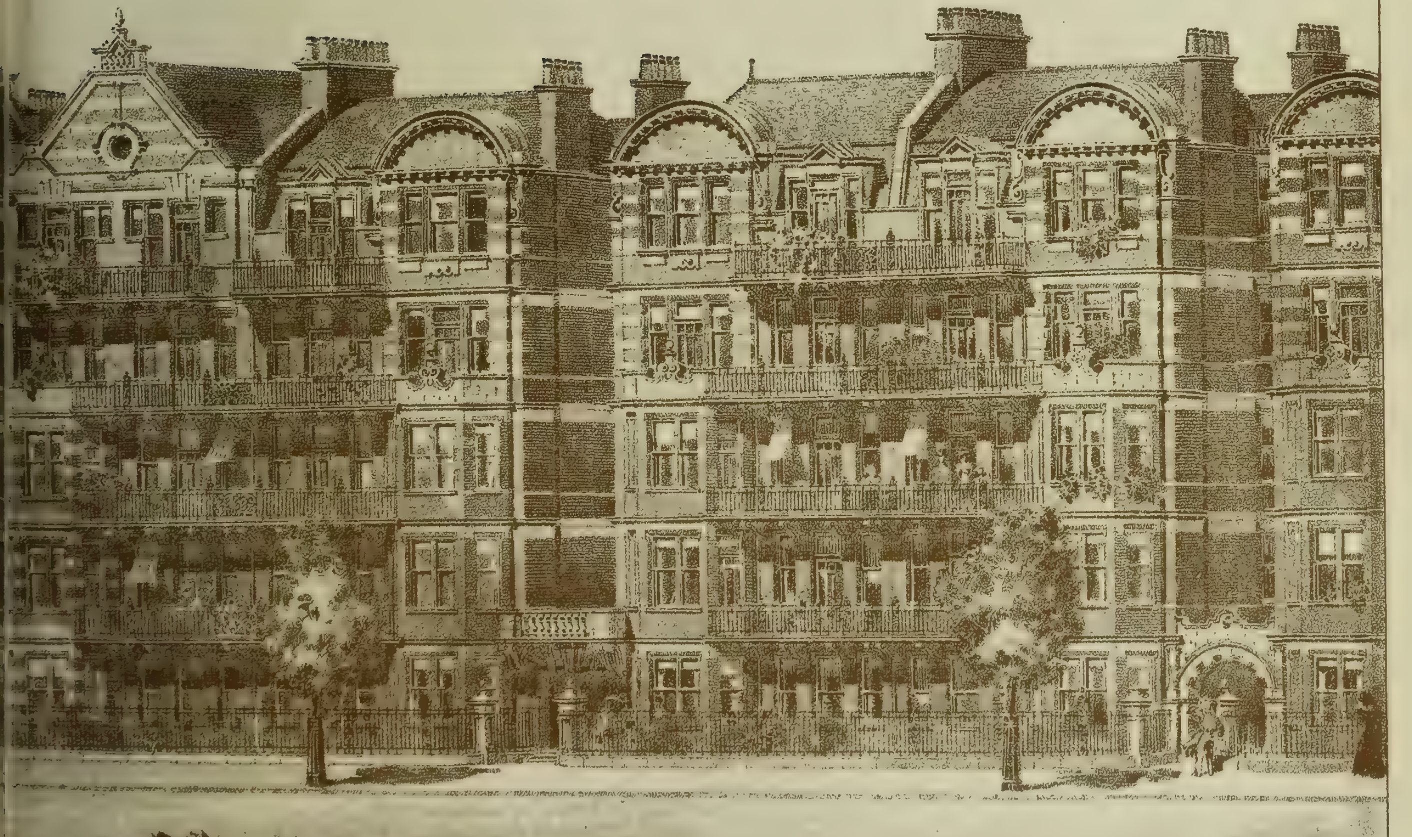


FOURTH FLOOR PLAN.



ROOF PLAN.

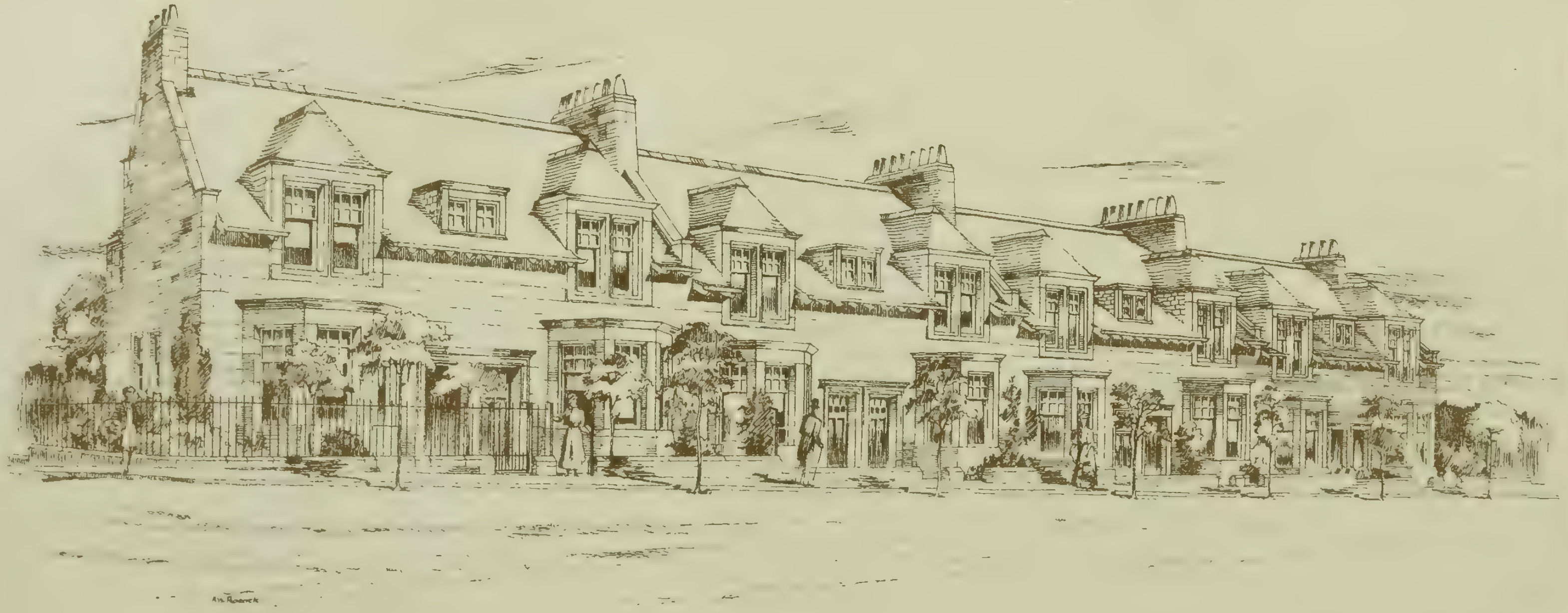
JOHN A GILL KNIGHT A·R·I·B·A· ARCHT·

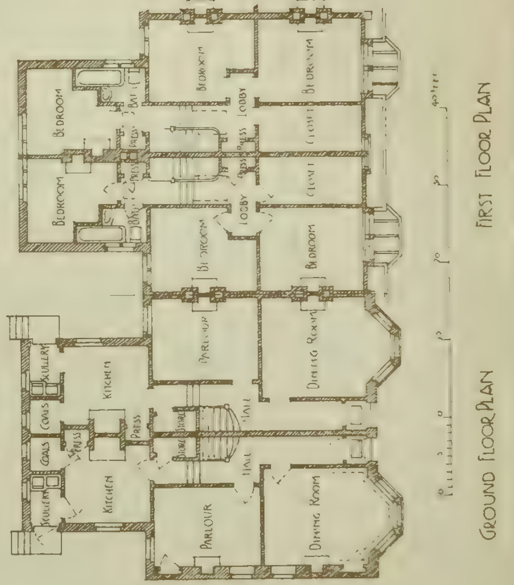


"PHOTO-TINT," by James Akerman [illegible] Queen Square London W.C.

THE BUILDING NEWS SEP. 8, 1899.

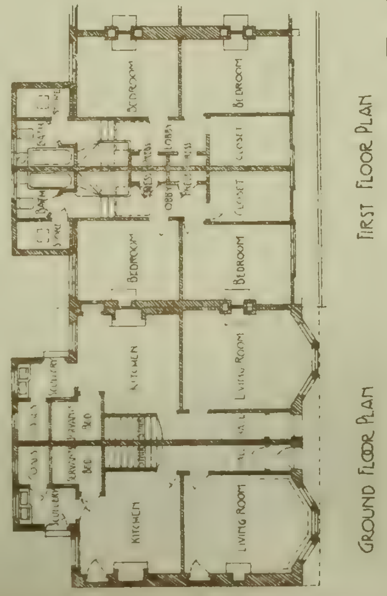
PLEWLANDS EDINBURGH

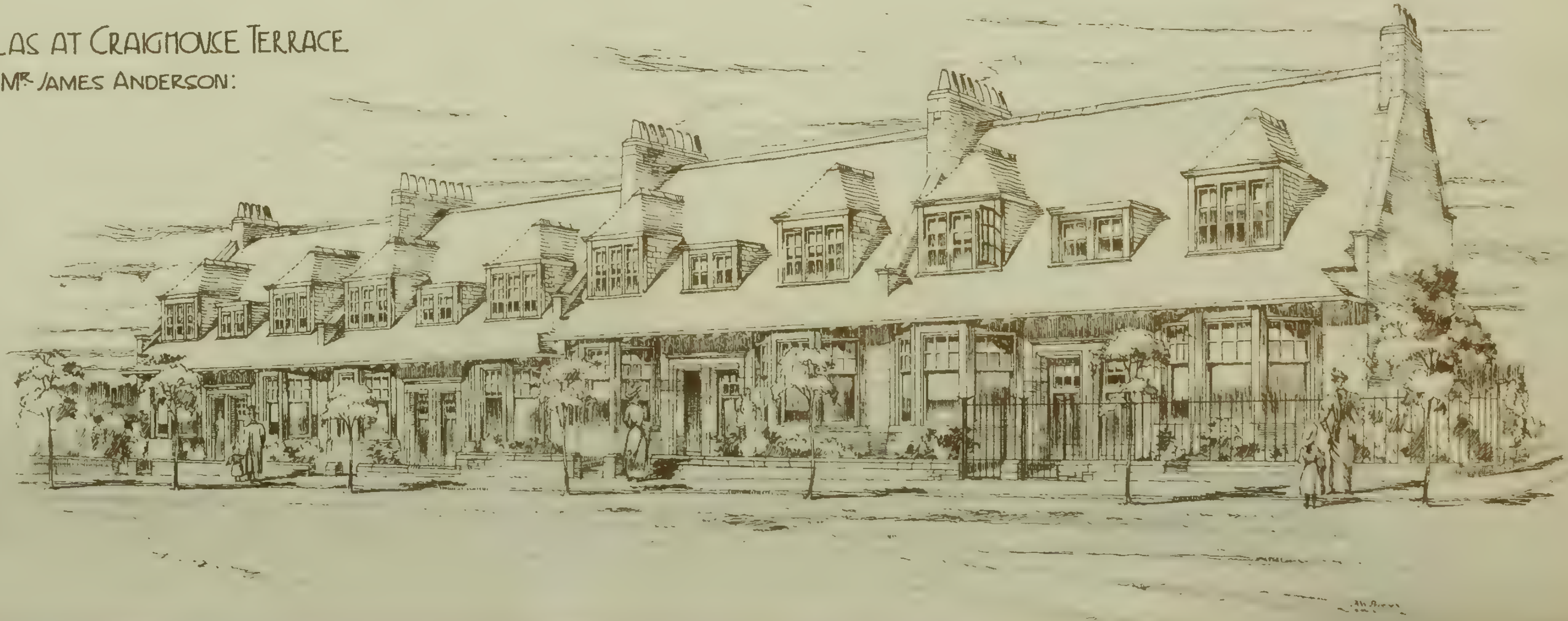




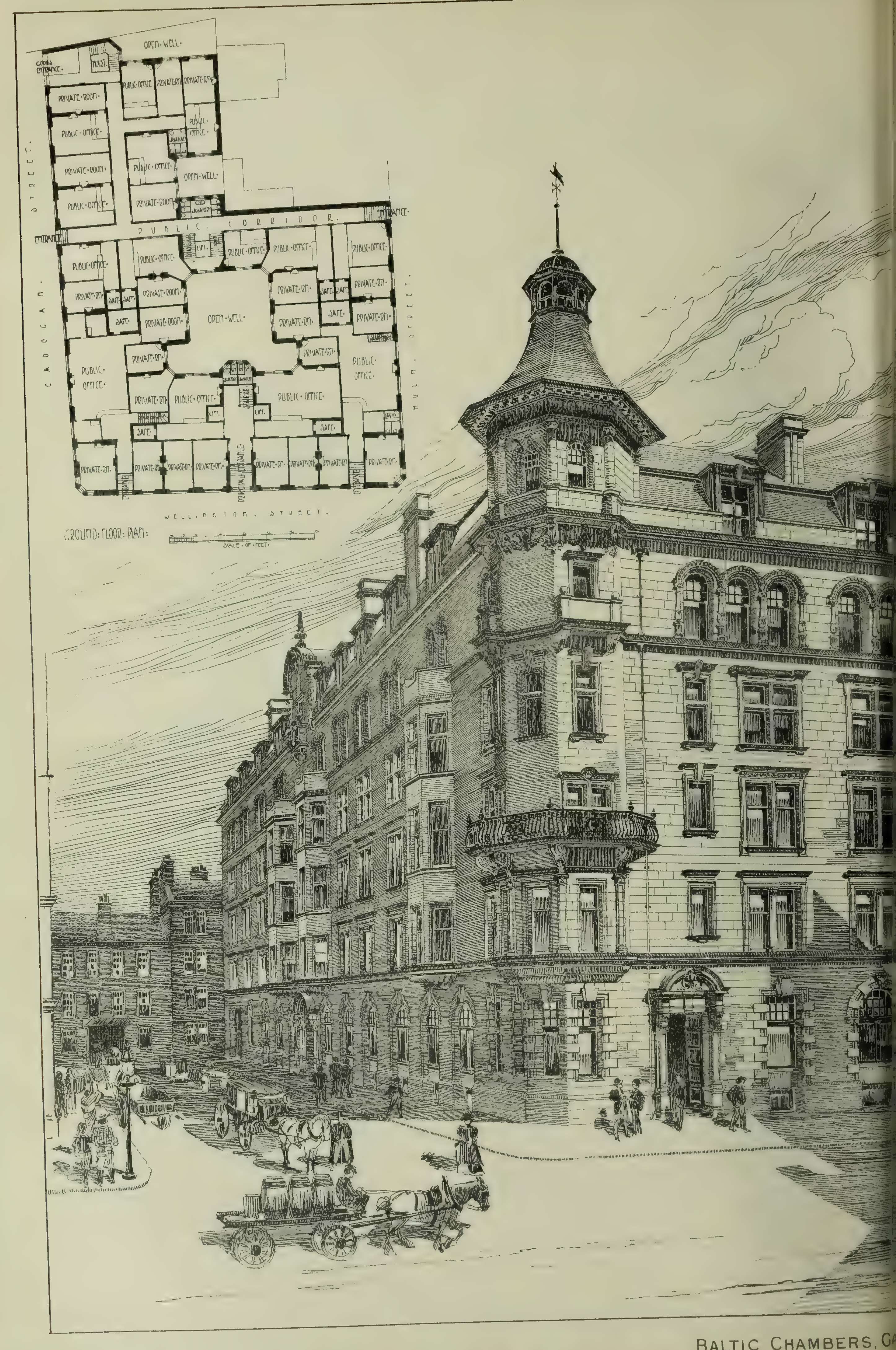
VILLAS AT CRAIGHOUSE TERRACE

FOR MR JAMES ANDERSON:

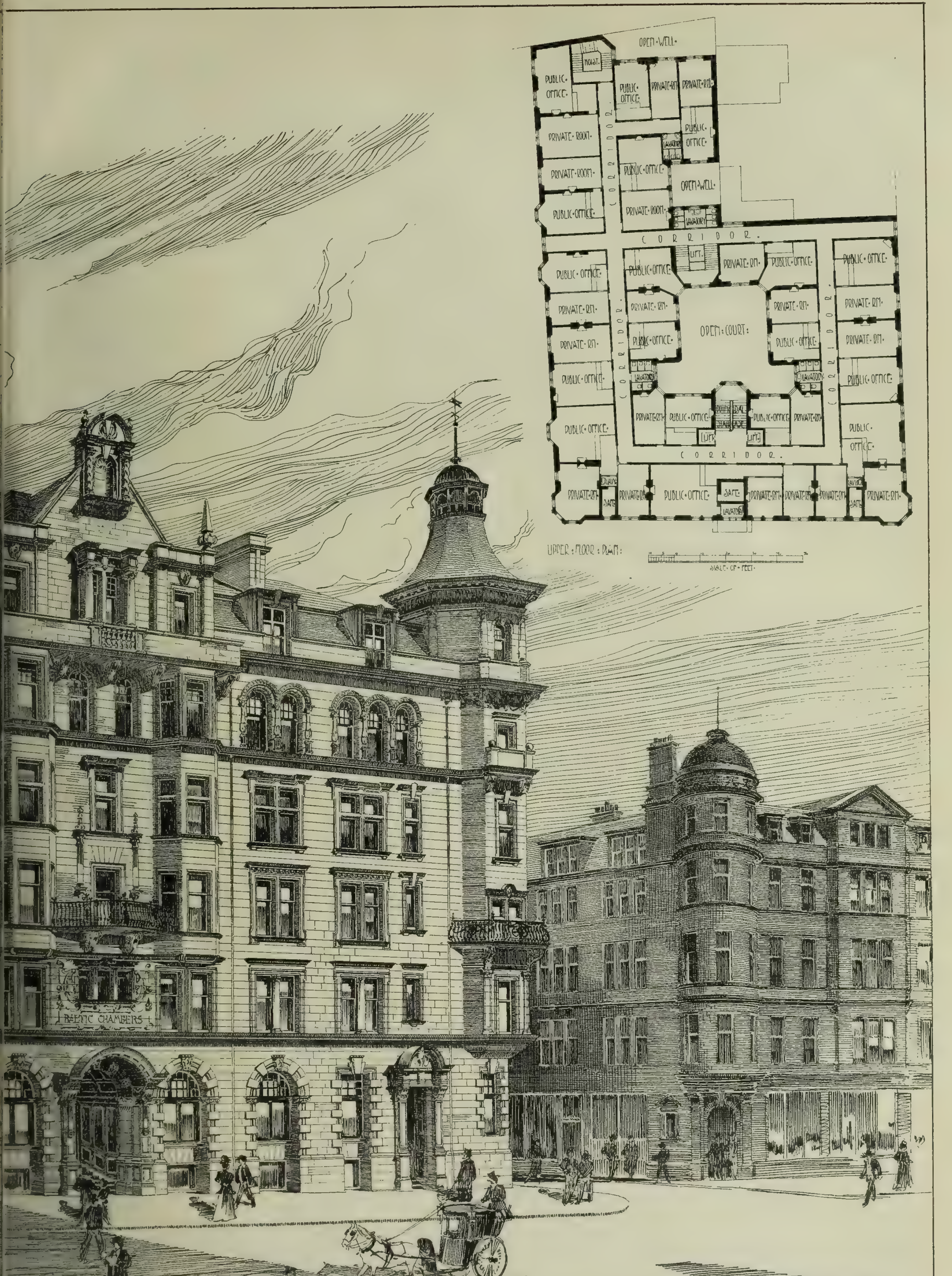




DUNN & FINDLAY ARCHTS

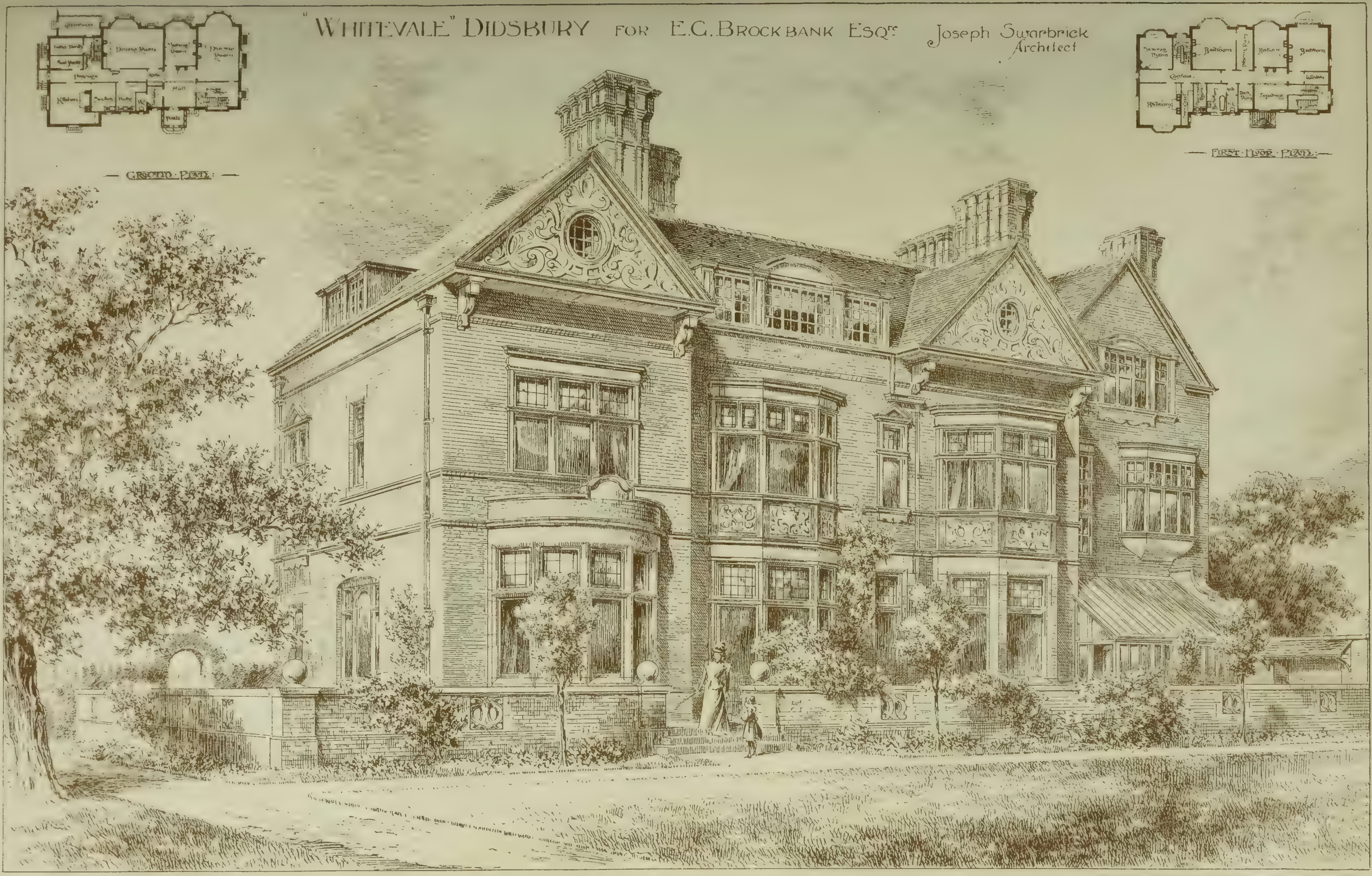


BALTIC CHAMBERS,



W D. Mc NAUGHTAN I A . ARCHITECT

Photo-Lithographed [illegible] W.C.



"WHITEVALE" DIDSBURY FOR E.G. BROCKBANK ESQre

Joseph Swarbrick
Architect

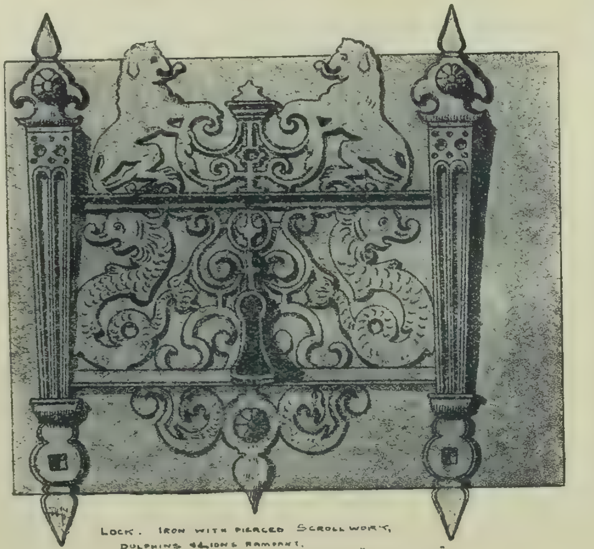
STUDIES of WROT-IRON WORK

of VARIOUS **HISTORIC** PERIOUS.

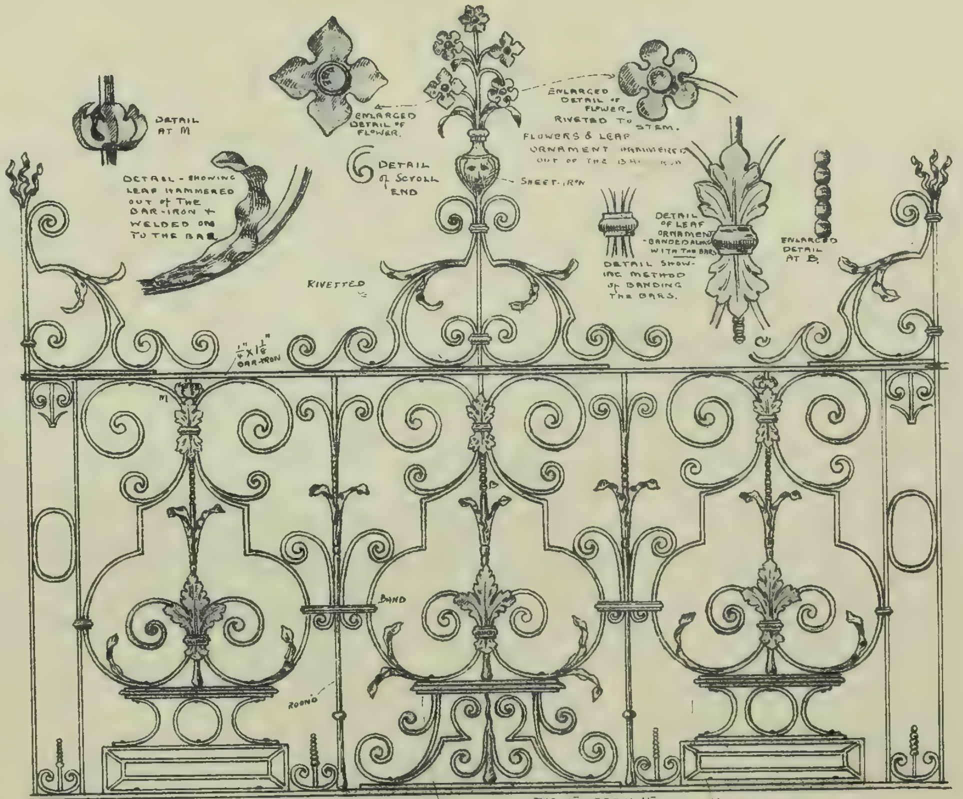
MEASURED AND DRAWN TO SCALE

FROM THE ORIGONALS IN

SOUTH KENSINGTON MUSEUM.

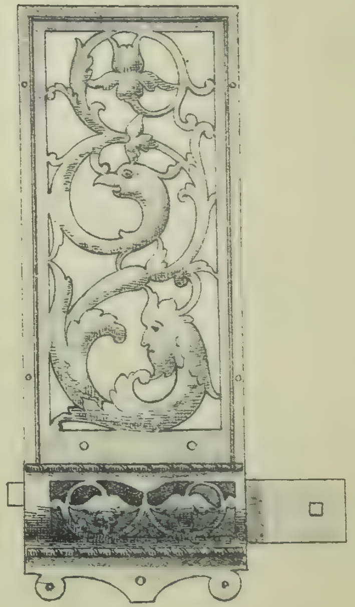


LOCK. IRON WITH PIERCED SCROLL WORK, DULPHINS & LIONS RAMPANT.
FLEMISH - ABOUT 1600. LENGTH 11½" BREADTH 11½"
FROM THE ORIGINAL IN S.K.M.


DETAIL AT M
ENLARGED DETAIL OF FLOWER.
DETAIL - SHOWING LEAF HAMMERED OUT of THE BAR-IRON & WELDED ON TO THE BAR
DETAIL of SCROLL END
ENLARGED DETAIL OF FLOWER_ RIVETED TO STEM.
FLOWERS & LEAF ORNAMENT HAMMERED OUT OF THE BAR IRON
SHEET-IRON
DETAIL OF LEAF ORNAMENT - BANDED ALONG WITH THE BARS
DETAIL SHOWING METHOD of BANDING THE BARS.
ENLARGED DETAIL AT B.
RIVETTED
¼"X1½" BAR-IRON
M
BAND
ROUND
Section
SECTION.

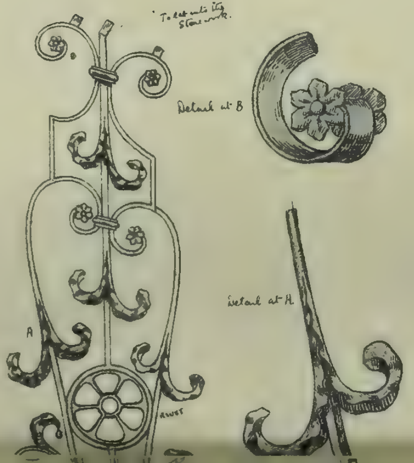
PART of a SCREEN. WROUGHT-IRON.
ENGLISH. EARLY 17th cent.
FROM S.K.M.

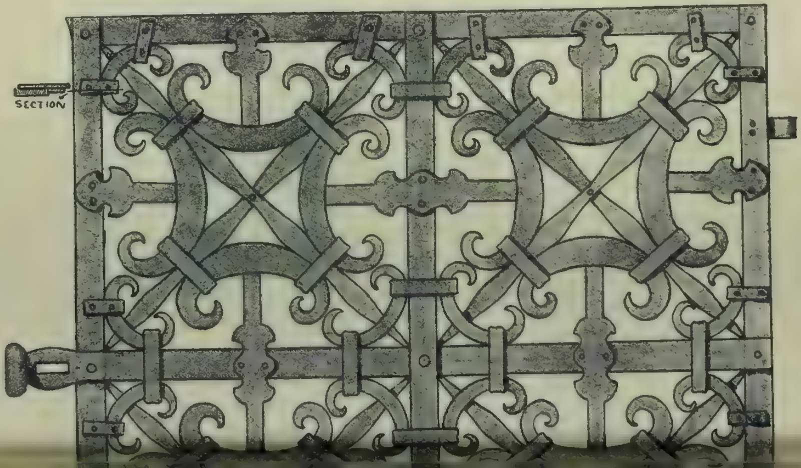
THE SCREEN IS HAMMERED OUT of IRON BAR ½"x¼".
THE CENTRAL BARS ARE ½"-ROUND-IRON.

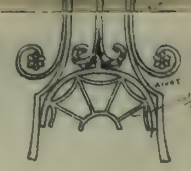


BOLT - WROUGHT-IRON, with open scroll-work
FRENCH. Early 16th Cent.

THE SCROLL-WORK IS PIERCED & REPOUSSED FROM THE ORIGINAL IN S.K.M.

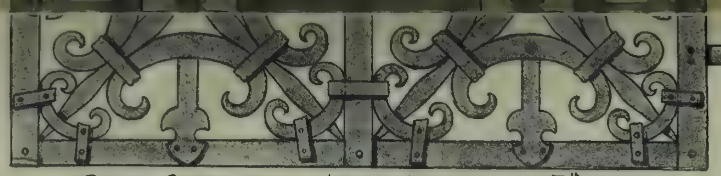




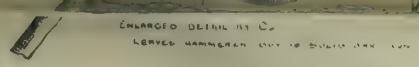


The majority of the bar-iron used is [illegible].
The foliage is welded to the bars. -

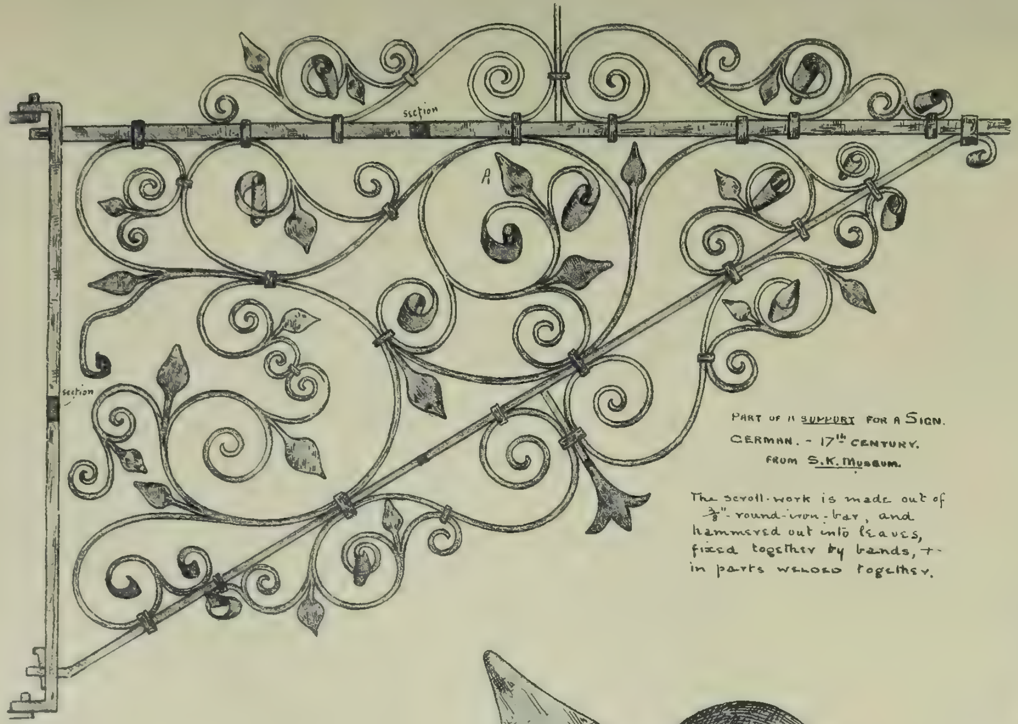
MEASURED FROM THE ORIGINAL IN S.K.M.



GRILLE. STRAPWORK. ITALIAN (VENETIAN). 17th CENT.
HAMMERED OUT OF THE FLAT AND RIVETTED TOGETHER BY STRIPS, SOME PARTS ARE BANDED. FROM THE ORIGINAL IN S.K.M.

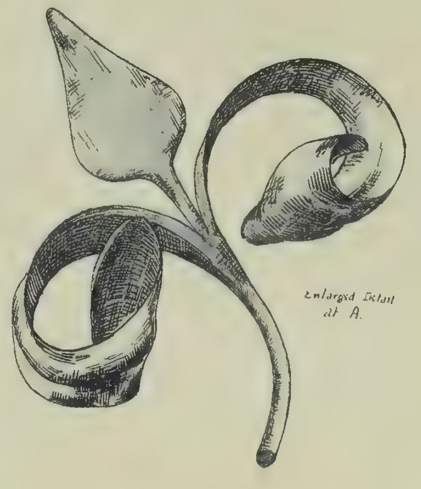


ENLARGED DETAIL AT C.
LEAVES HAMMERED OUT OF SOLID BAR IRON



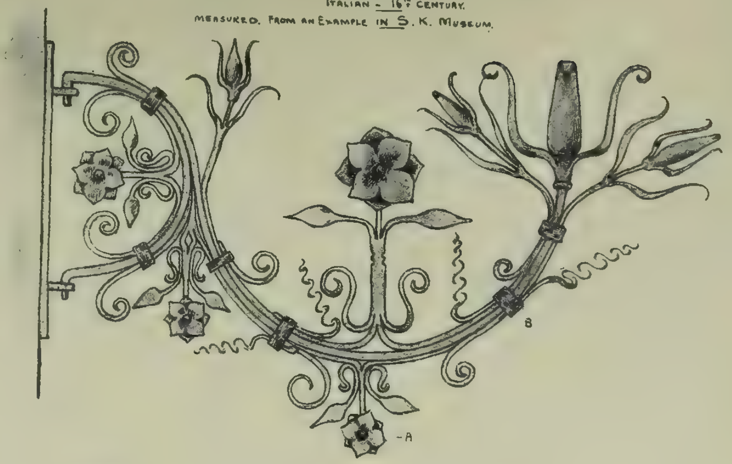
PART OF A SUPPORT FOR A SIGN.
GERMAN. - 17th CENTURY.
FROM S.K. MUSEUM.

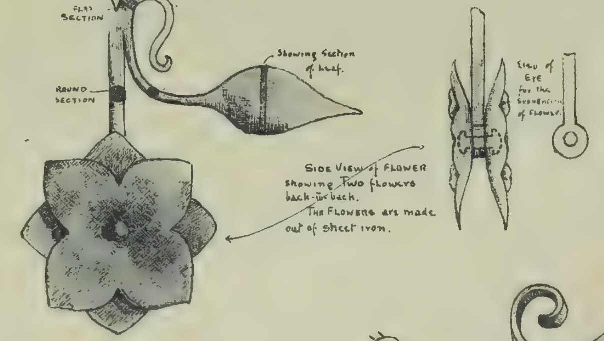
The scroll-work is made out of ⅜" round-iron-bar, and hammered out into leaves, fixed together by bands, + in parts welded together.



Enlarged Detail at A.

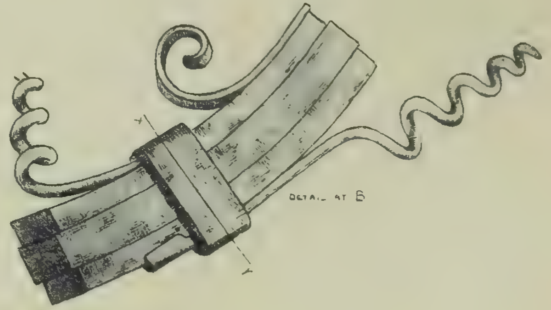
ONE OF A PAIR, OF WROT-IRON SCROLL-WORK BRACKETS.
ITALIAN - 16th CENTURY.
MEASURED. FROM AN EXAMPLE IN S. K. MUSEUM.





SIDE VIEW of FLOWER showing two flowers back-to-back.
The FLOWERS are made out of sheet iron.

DETAIL AT A. FRONT VIEW -



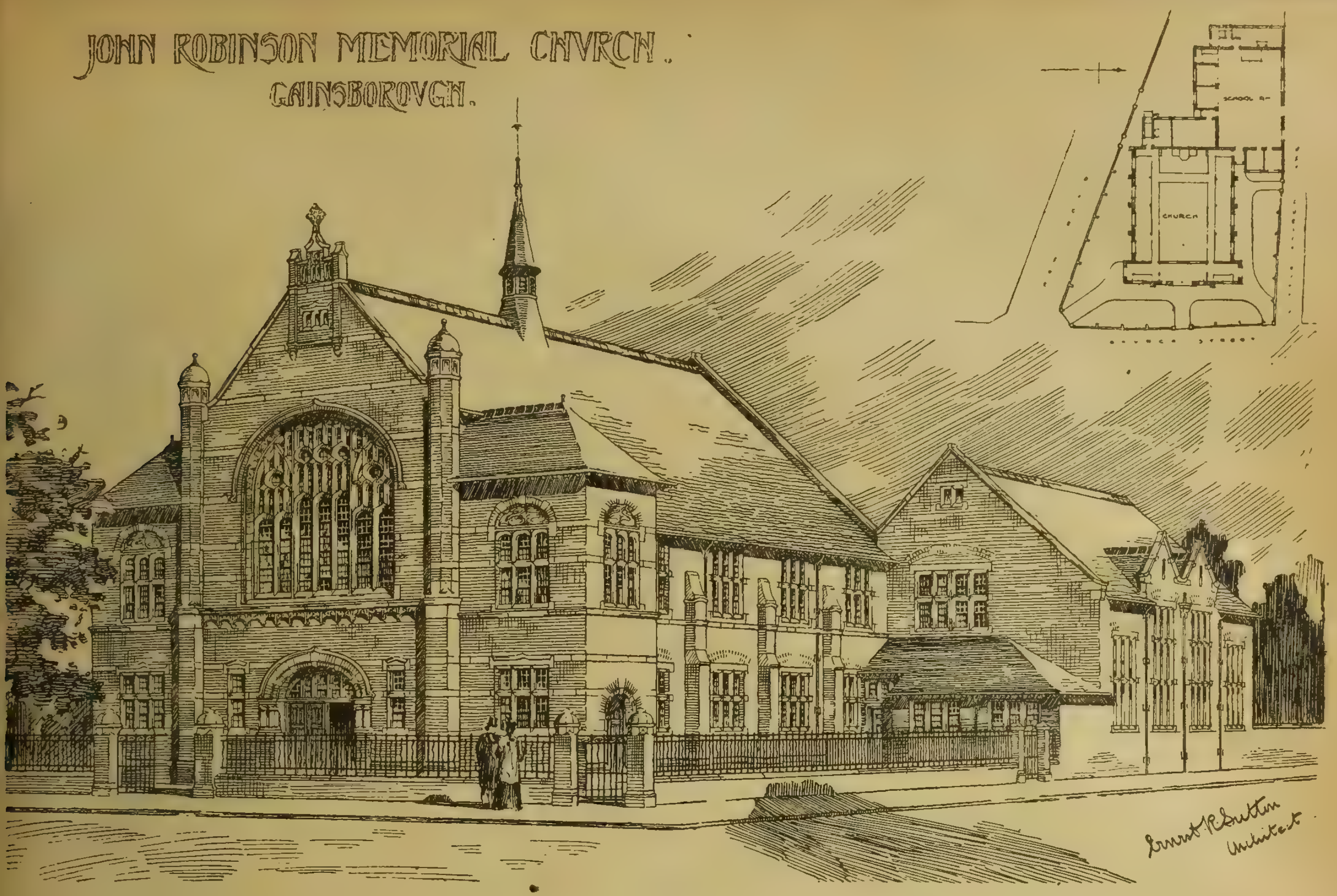
DETAIL AT B

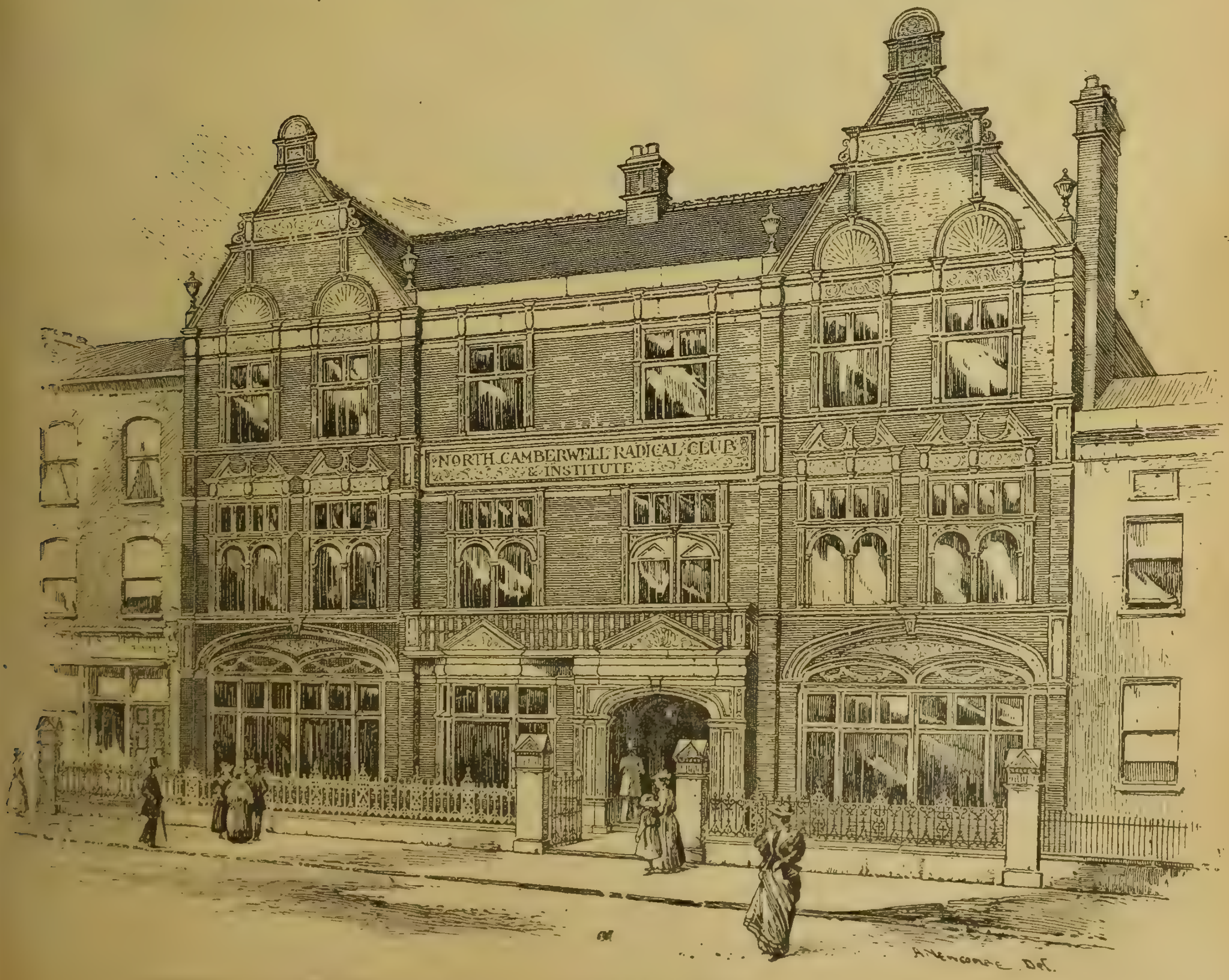
Section through XY, showing binding together of strips.

NATIONAL BRONZE MEDAL DRAWINGS

"STUDIES OF HISTORIC METAL WORK BY GEORGE T. EASTEN"

"PHOTO-TINT", by James Akerman, Queen Square, London W.C.




NORTH CAMBERWELL RADICAL CLUB & INSTITUTE
A. Newcombe Del.

NORTH CAMBERWELL RADICAL CLUB AND INSTITUTE.—A. J. Perriam, *Architect.*

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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RECEIVED.—J. K. M.—W. H. Mainwaring.—Ganot.—P. H. and Co.—W. C. P. (Notts)—Mosaic.—A. H. K.—C. B. L.—Merioneth.—W. N. and Son.—F. N. P.

Correspondence.

LIMES AND MORTAR.

To the Editor of the BUILDING NEWS.

SIR,—I think that your contributor, "H. C. S.," who seems to set himself up as an authority on limes and mortar, must be an amateur at the business, or perhaps even a jerry builder, for to the "jerry" increase in bulk means increase in money.

I cannot believe that a man with any practical connection with the subject would hold such ideas.

Pure carbonate of lime has been condemned by the highest authorities as unfit for good work, and of use only (as mortar) in temporary structures.

"H. C. S." himself states that: "In thick walls the air current rarely penetrates, and as a consequence the uncarbonated lime remains in the interior for many years." Now this I consider is decidely objectionable, as the whole of the pressure caused by the superincumbent mass is thrown upon the outer edge of the stone, brick, or whatever it may be; consequently there is a process of chipping or flushing.

Again, he states that "limestones containing certain proportions of carbonate of magnesia, good as they are for building stones, do not yield a good lime, but a poor one, that allows building mortar to set very slowly, and is better suited for hydraulic lime."

I have yet to learn that a slow-setting or mildly hydraulic mortar is a defect in sound construction. Chemical knowledge, no doubt, is an excellent thing when combined with practical experience.—I am, &c.

Edge Hill, Liverpool. W. REID.

Intercommunication.

QUESTIONS.

[12306.]—**Architect's Charges.**—Three persons agreed to build three houses in connection with each other and share equally the cost. I agreed to prepare plans and superintend the erection for three per cent. on total outlay. Ultimately three other persons joined in the scheme for three more houses to be built, the commission then to be 2½ per cent. on the total outlay instead of 3 per cent. Quantities are to be supplied, for which an additional commission is to be paid. The plans are all thought out and pencilled-in ready for inking, and, of course, the plot has been surveyed and levels taken, but the quantities have not been touched yet. One of the intending builders has now withdrawn from the scheme, and is willing to pay me what he calls his sixth share of cost already entailed. Will any reader of experience kindly give me his judgment of what he thinks would be a fair charge for me to make to the person who is withdrawing? I think I ought to be paid for something beyond the mere time of pencilling-in his share of the scheme, because it is part of a whole which has had to be thought out, and, further than that, there is the loss of commission which I had a right to anticipate receiving.—PERPLEXED.

[12307.]—**"Builder James."**—I clip the following from the "Obituary" column of the *Standard* for the 2nd inst.:—"SPICER.—On the 30th August, at 315B, Norwood-road, Herne-hill, S.E., 'Builder James,' the beloved husband of Selina Spicer. Interred at Norwood Cemetery at 2 o'clock on Monday, the 4th inst." Who was "Builder James"? A reference to the current issue of Kelly's *Building Trades Directory* does not solve the problem.—H.

[12308.]—**Freezing Process for Slate-Splitting.**—I believe there is a process at some quarries for splitting slates by freezing, and I should be glad if some reader can inform me where such process is carried into effect.—BIRMINGHAM.

[12309.]—**Portland Cement Stucco.**—I find many seaside towns have the houses stuccoed. Will anyone experienced inform me if this covering is the best to prevent dampness coming through, and what proportion the mixture should be, and what sand should be used? Also the thickness?—IBID.

[12310.]—**Hip-Tiles.**—I have seen hip-tiles made with cross-ribs or fillets cast on the face on each side which can be used for climbing purposes. These horizontal ribs look well. Where are they made? I have seen many new houses at Folkestone with hip-tiles of this kind.—ENQUIRER.

[12311.]—**Cost of Mahogany.**—Having to make an estimate for some mahogany doors and fittings, I shall be obliged to hear what the prime cost of the best Honduras and Spanish mahogany is?—A. L.

[12312.]—**Sanitary Fittings.**—Should like to know of some inexpensive open gully-trap that can be placed to receive waste-pipes from lavatory, &c.?—A BUILDER.

REPLIES.

[12288.]—**Instructions to Obtain Tenders.**—"Inexperienced" has a claim for quantities prepared, according to the decision given in the case of "Moon v. Witney Union." As the contractor states he could not have given a tender without quantities, there is a good case. It is a good plan to inform client that quantities are necessary before tenders are invited; but, as one correspondent says, there is an implied authority on the part of the architect to get them prepared, as they are the only proper means in determining cost.—G.

[12293.]—**Wood Paving.**—I think the wood blocks used in many of the London streets are of "Jarrah"; it is exceedingly hard and durable, and the cost is about 12s. to 15s. per yard. The concrete is about 6in. to 9in. deep. The cost would largely depend on the quantity to be laid. I should recommend "Countryman" to get a tender from a company who puts down such paving.—NO SIG.

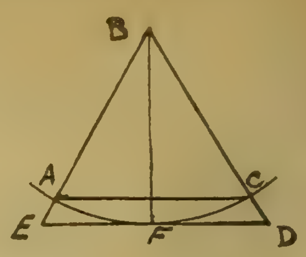
[12295.]—**Architect's Charges.**—I am quite aware of what Charles T. Ruthen informs me, that an architect can charge 5 per cent. on preparing plans and superintending the work; but I believe he can charge in addition ½ per cent. for obtaining tenders. The question is, if he has a right to charge for this if they have been obtained independently of him, or if the builder had sent in tenders on the client's solicitation.—QUERY NO. 2.

[12297.]—**Masonry and Stonecutting.**—What I want to know is how to obtain the method of setting-out stone arches and cutting the bevels for straight and circular arches on plan? "Regent's Park's" answer refers to the theory of stability or thrust, for which I am obliged; but my object is chiefly to get a work on the practical part of construction. I think there have been treatises published that will give this information, and the series of articles in the BUILDING NEWS on "Stonecutting," by Mr. Laurence Harvey, which appeared some years ago, will give me all information. Can anyone give me the year or date of publication when these appeared?—A. STUDENT.

[12298.]—**Macadam.**—Why not refer to the author's own works: "A Practical Essay" (1819), "Remarks" (1820), and "Observations" (1822)?—J. DORMER.

[12300.]—**Automatic Flushing Tanks.**—Siphon having widened overflow and discharged latter sealed in water trap below, so that the air may be compressed in the siphon before the water falls over lip and starts it, is a general arrangement. Another one is a watertight valve in tank, balanced at opposite end of lever by small tank. Overflow of large tank fills small tank and overbalances lever raising large valve and flushing. A siphon pipe from small cistern into large one is started by rush of water, empties small cistern back into large one; valve closes, and tank collects water once more. See W. R. Maguire's "Domestic, Sanitary," &c., and many others.—R. P.

[12303.]—**Mensuration.**—A regular hexagon may be divided into six equilateral triangles. Let B be the centre of the circle whose area is required, and A B C one of the equilateral triangles into which the inner hexagon is divided. Then E B D will represent one of the equilateral triangles into which the outer hexagon is divided, and A C D E will be one-sixth of the area given, that is $\frac{813}{6} = 135{\cdot}5$. Suppose the diameter of the required circle to be 50, then B C = 25, and the area of the equilateral triangle A B C is $12{\cdot}5 \times 12{\cdot}5 \times \sqrt{3} = 270{\cdot}633$. Again, the area of the equilateral triangle E B D, whose height B F = radius = 25, is $\frac{25 \times 25}{\sqrt{3}} = 360{\cdot}854$. The area of A C D E is equal to the difference of these two triangles $= 330{\cdot}854 - 270{\cdot}633 = 90{\cdot}221$. But by the problem the area should be 135·5; therefore we have to find the side corresponding to A C of a larger figure similar to A C D E, whose area is 135·5. It is shown by Euclid VI. 20, that the areas of similar figures are to one another as the squares of their corresponding sides, therefore we have this proportion—



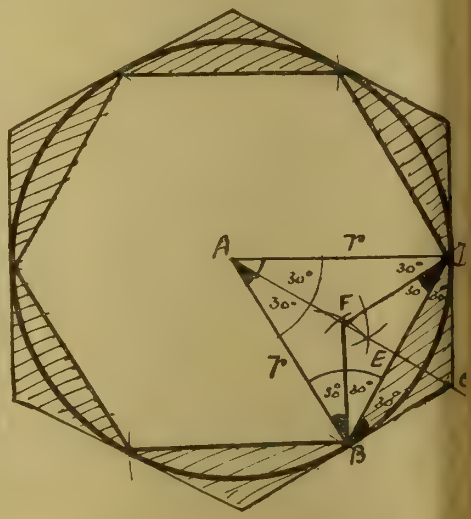
$$\frac{AC^2}{90{\cdot}221} = \frac{\text{the square of side corresponding to } AC}{135{\cdot}5}$$

Therefore the square of the side corresponding to A C

$$= \frac{AC^2 \times 135{\cdot}5}{90{\cdot}221} = \frac{25^2 \times 135{\cdot}5}{90{\cdot}221} = 938{\cdot}77$$

Extracting the square root of each side of the equation, we get the required side corresponding to A C = 30·639, which is also the radius of the circle. Therefore the diameter of the required circle is $30{\cdot}639 \times 2 = 61{\cdot}278$, and its area $= (61{\cdot}278)^2 \times {\cdot}7854 = 2949{\cdot}3$sq.in.—J. B. N. C.

[12303.]—**Mensuration.**—In diagram area of shaded portion is 813sq.in. A B D is an equilateral triangle, six of which make up the interior hexagon. Bisect the angles A B E, A D E by the straight lines B F, D F. Then the four angles A F B, A F D, B F D, B C D are equal in area, for each has two equal sides and two equal angles. (See diagram.) ∴ area of triangle A B D = three times area of triangle B C D. ∴ area of int. hexagon = three times difference of areas of the two hexagons. ∴ area of interior hexagon = 3 × 813sq.in. = 2,439sq.in.; but area of hexagon having a side, "r"—



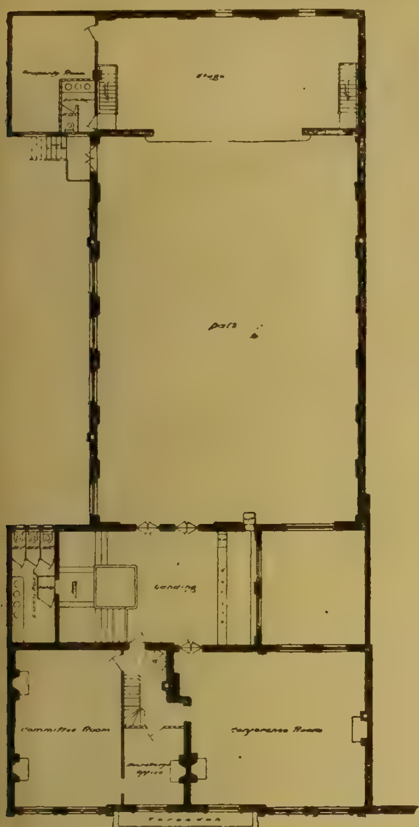
$$= \frac{6 \times \sqrt{3}\, r^2}{4} \quad \therefore r^2 = \frac{2{,}439 \times 4}{6 \times \sqrt{3}} = 542\sqrt{3}\text{sq.in.},$$

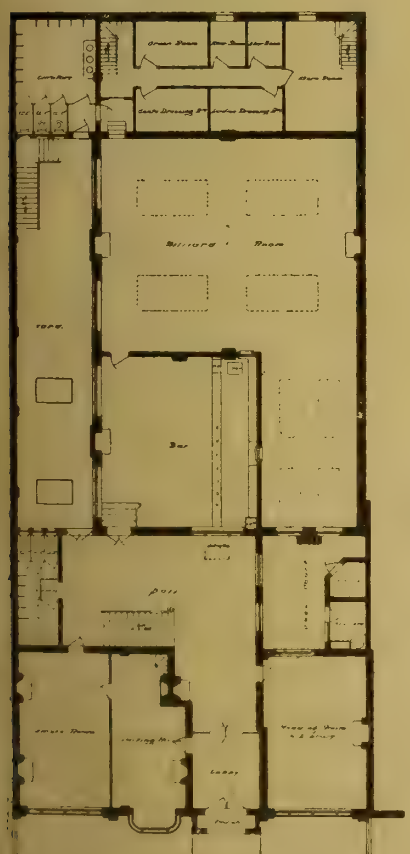
but area of a circle having radius "r" $= 3{\cdot}14159 \times r^2$. ∴ area of circle $= 542\sqrt{3} \times 3{\cdot}1459$sq.in. $= 2{,}947{\cdot}44602118$ square inch.—JOHN SHAW, Lancaster.

[12304.]—**Reversed Roman Letter.**—Most likely the signs for 100 and 1,000 are merely initial letters of Centum and Mille. The ancient forms of D and M—viz., IↃ and CIↃ—have ceased to be familiar. By extension of this style, IↃↃ denoted 5,000, CCIↃↃ 100,000, CCCIↃↃↃ 1,000,000, D was also IↃ, 500, DC or IↃC 600, DCC or IↃCC 700, DCCC or IↃCCC 800, DCCC or IↃCCCC 900, M or CIↃ 1,000, CIↃCIↃ, IICIC, IIM 2,000, IↃↃ, V, 5,000, CCIↃↃ 10,000, IↃↃↃ 50,000, CCCIↃↃↃ 100,000, CCCCIↃↃↃↃ 1,000,000. Possible aid.—REGENT'S PARK.

[12305.]—**Utilising Sawdust.**—Perhaps these two compositions may serve for your purpose. Used for fire-lighters of wood—60 parts melted resin, 40 parts tar; wood dipped for instant. Quart of tar, 3lb. of resin, melt, cool, mix as much sawdust with a little charcoal added as can be worked up; spread out on board; when cold break up into lumps size of hickory nuts. Use cheapest resin, add about 2oz. of tallow to each pound of resin, melt resin, then add the resin. Mix with sawdust and pour into moulds made of boards, which can be knocked apart and the mass broken up.—REGENT'S PARK.

THE NORTH CAMBERWELL RADICAL CLUB AND INSTITUTE.





THESE premises are now being rebuilt in the Albany-road, Camberwell, S.E., at a cost of nearly £7,000. The internal walls of existing front buildings are utilised. The ground floor will have a large billiard-room for four tables, with bagatelle-room adjoining, alsc large bar, smoking, reading, waiting, and dressing-rooms, and gentlemen's lavatories. On the first floor there will be a large hall to accommodate 700 persons, with stage, property-room, etc., also serving bar, conference and committee rooms, secretary's office, and ladies' lavatories. On the second floor are committee and chess-rooms, kitchen, and accommodation for manager. The front will be faced with red bricks and stone dressings. The entrances, staircases, and buildings in are rear to be of fireproof construction. The architect is Mr. A. J. Perriam, of Cannon-street, E.C.

CHIPS.

At the Trades Union Congress at Plymouth yesterday, it was decided that steps should be taken to extend the Factory Acts to the whole of the building industry, with a view of providing a sufficient number of qualified building inspectors for examination of all the plant and machinery in building works.

The District Hospital, Aberdeen, is being warmed and ventilated by means of Shorland's patent Manchester stoves, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A trial trip of the new gas motor-cars, which are to supersede the old tramway service between Neath and Briton Ferry, took place last week. The Neath Town Council is the first municipal body which has adopted the new system introduced by the British Gas Traction Company, Limited. The permanent way has been laid by Mr. August Krauss, of Bristol. This permanent way and the car service were inspected and approved by an official from the Board of Trade earlier in the week.

The Great Western Railway Company have accepted the tender of Mr. H. Weldon, A.M.I.C.E, of Birmingham, for the construction of a light railway from Congresbury Station, on the Cheddar branch of their system, along the valley of the River Yeo to Blagdon. The length of the line will be seven miles, with stations at Congresbury, Wrington, Langford, Burrington, and Blagdon.

Alderman Robert Lauder died on Sunday at his residence, Broomhill, West Hartlepool, aged 79. Mr. Lauder was a native of Inchture, Perthshire, and in 1857 set up at West Hartlepool as a timber merchant, with the late Mr. Joseph Mellanby. He was one of the early members of the Improvement Commission, and afterwards he served as an Alderman. In 1890 he was chosen mayor. The present mayoress is his daughter.

A new parish church at Springburn, Glasgow, was formally opened on Sunday. The church is seated for 1,200 persons, and the Communion-table, moderator's choir, and other fittings are of carved oak. The special gifts include two stained-glass windows presented by Mr. Hugh Reid, of Hyde Park Locomotive Works, and a three-light window conjointly by Messrs. Collier, Hoey, and Lindsay, the last named being architect of the building. These windows, on which are portrayed scenes from the life of Christ, were designed and executed by Mr. Norman MacDougal.

The porch of the Guildhall of the City of London, which was begun in 1425-6, though damaged by the Great Fire, was found sufficiently intact to be preserved. The interior is a fine example of Perpendicular Gothic, with panelled walls and a vaulted roof ornamented with large bosses, bearing various coats of arms. Some time ago the City Lands Committee resolved to have the accumulated paint and plaster removed from the interior, and the work is now practically completed. The stonework thus laid bare is very good in the case of the walls and the mullions of the panels, but the ribs of the vaulting are revealed to be in a ruinous condition. The City Lands Committee is not at present authorised to make good the decayed stonework, but in the end it is most likely that new masonry will be substituted for the old, where required.

Mr. J. Passmore Edwards has offered the sum of £4,000 for the erection of a cottage hospital at the corner of Shrewsbury-road, East Ham. The committee have already collected £2,000 towards the purchase of the site, but require £1,500 to complete the sale.

The Board of Trade have recently confirmed an order authorising the construction of light railways in the county of Kent, in the borough of Chatham, and the urban district of Gillingham.

It is satisfactory to be able to report that the Danish lock-out has come to an end. The Builders' and Carpenters' Union, which does not belong to the trades-union alliance, and consequently has taken no part in the recent negotiations, having given its adhesion on Tuesday to the terms of agreement for the termination of the great lock-out, the latter was finally signed by representatives of the employers and men. Work is being resumed at once, and the resumption of operations will be general by to-morrow (Saturday).

Building Intelligence.

ABERDEEN.—The drill-hall and offices of the 1st Aberdeen Artillery Volunteer Corps in North Silver-street are nearing completion. The building, which was designed by Mr. Alexander Mayor, architect, is three stories in height. On the ground floor are the officers' rooms, the clothing store, armoury, storeroom, offices, and commanding officers' business apartment. The large hall, 150ft. by 50ft., will now be used exclusively for company drill and for dancing assemblies. Adjoining this are two other spacious halls to be used for the position battery and garrison company gun drill respectively. On the first floor there is a large hall, and also three reading and recreation rooms for the volunteers, and a couple for the sergeants' mess. On the third floor there is a large store for the men's greatcoats and other equipment, with a smaller room for the saddlery.——The Northern Co-operative Company, Limited, opened their spacious new warehouses at Millbank, Berryden-road, on Friday. The building was designed by Mr. R. G. Wilson, achitect. There are six flats, including the basement and attics. The establishment has been provided with a complete system of hoists and lifts worked by electricity, while provision is made for electric lighting. The motive power is supplied by the company's own installation, and the plant has been provided by Messrs. H. Wilson, Baggot, and Company. Approximately the cost of the establisment is £10,000. The contractors were Mr. Leslie Smith, builder; Mr. Alexander Hall, joiner; Messrs. Adam and Company, slaters; Messrs. Thom and Strachan, plumbers; Mr. George Leith, plasterer; and Mr. John Williamson, painter.——One of the largest blocks of buildings constructed in Aberdeen for a considerable time is now nearing completion in Rosemount Viaduct, where the Aberdeen Town and County Property Company, Limited, have erected shops and dwelling-houses, extending between Skene-terrace and Skene-street, and numbering from 1 to 23. The buildings are four stories in height, and consist of tenement houses above shops on the ground floor. The approximate cost has been between £13,000 and £14,000. Mr. George Hall is the builder, and Messrs. Brown and Watt are the architects.

DUBLIN.—Some time ago a departmental committee consisting of Captain Abney (director of science teaching at South Kensington), Mr. Barton (the Commissioner of Valuation for Ireland), and Mr. R. A. Holmes (the Treasury Remembrancer) was formed to report as to the buildings and site of a proposed new Royal College of Science for Ireland. It is now announced that the Government have arranged to acquire the whole of the house property and ground occupying the site recommended by the departmental committee in addition to the buildings mentioned in the report (Nos. 1, 2, and 3, Upper Merrion-street, Dublin). The Government will also take over No. 4, Merrion-street. The total area thus acquired amounts to over 50,000 superficial feet, and the new buildings will have a frontage both on Kildare-place and Upper Merrion-street, and will, as the report recommends, be in immediate connection with the Museum of Science and Art.

DUDLEY.—The Opera House in Birmingham-road was opened on Monday. The style is Italian, of the Renaissance period, and the material of the elevation is red brick, with terra-cotta dressings. In the oval panels in the centre of each wing of the façade are inscribed in gilt Shakespearian quotations. There is a frontage of 150ft. in breadth and 66ft. in height from the ground floor to the figure on the apex of the façade. Four double pairs of swing-doors lead to an entrance-hall, similar doors to the right and left being provided for exits. The floor of the entrance-hall is tesselated, and the walls have an encaustic-tiled dado and embossed cornice. A door from the entrance-hall opens directly into the pit, and a broad staircase with encaustic-tiled dado leads to the dress-circle foyer. The height of the interior of the theatre from the floor to the dome is 41ft., and the arrangement of the auditorium, which seats 2,000 people, consists of orchestral stalls, pit, dress circle, amphitheatre, and gallery, whilst near the stage are six private boxes, three on each side. The dome is supported by eight panelled buttresses with ivory-white mouldings, and the large central space of the ceiling, which is richly moulded, bears a design of birds and foliage, the prevailing tint of the decorations being a shaded blue, relieved by gilt and sprays of pink flowers. The plastic decorations of the front of the dress circle and private boxes have been picked out in shades of pink, cream, and other soft tints, the embellishment of the front of the amphitheatre being of lighter design in garlanded flowers. The walls of the body of the building are coloured in shades of Pompeian red, with dados of darker hues. The stage has a width of 72ft. 6in., a depth of 36ft., and height, from the floor-line to the gridiron, 50ft. ; whilst the proscenium opening is 26ft. wide. The flies are about 20ft. above the floor level. The dressing-rooms are situated on the three floors of one side of the theatre. The building will be illuminated by electricity, which will be generated upon the premises, and in addition there is a complete gas installation. The architect was Mr. A. Ramsell, and the builders were Messrs. Whittaker and Co.

Tooting.—The Grove fever hospital at Tooting Graveney, erected at a cost of a quarter of a million, was opened without ceremony last week. It occupies a site of 27 acres, and the plans for the buildings, prepared by Mr. A. Hessell Tiltman, F.R.I.B.A., was selected in open competition by Mr. Alfred Waterhouse, R.A., the assessor to the board. These plans were subsequently improved, at the suggestion of the Works Committee, by the adoption of the "échelon" principle of arrangement for all the large pavilions, and this necessitated minor alterations in the general block plan. The hospital is capable of accommodating (at present) 518 patients, with capacity for enlargement in the direction of isolation blocks, ambulance station, and other buildings in the future. Cases of scarlet-fever, enteric fever, diphtheria, and general fever will be accommodated in small isolation wards and blocks for separate treatment. There is accommodation for 360 scarlet-fever patients, 120 diphtheria or enteric fever patients, whilst the remaining wards will be set aside for isolation purposes. There is also accommodation provided for an administrative staff of 324 persons. Advantage has been taken of the shape of the ground reserved for the nurses' and domestic servants' blocks to subdivide the dormitory accommodation to a very much greater extent than had hitherto obtained, with the result that better classification, with less liability of risks from fire, has been obtained. The ward pavilions are connected by covered ways (with subways under for mains, &c.) with the administration, laundry, reception, and mess blocks. All the twelve largest pavilion blocks are arranged axially due north and south, and are two stories in height, the ground floors being raised 5ft. over the level of the airing-courts, to secure a circulation of air under all the pavilions. Each scarlet-fever pavilion contains upon each floor a ward for twenty beds, and one for two beds, together with ward scullery, bath, sink, and w.c. rooms. The diphtheria and enteric blocks are arranged similarly, but with twelve beds in the large wards instead of twenty. The heating throughout is by a system of low-pressure hot water, supplemented in the wards by Galton stoves with open fires. The greater part of the structural work has been carried out by Messrs. Kirk and Randall, of Woolwich, under the superintendence of Mr. Tiltman, assisted by three clerks of works, the chief of whom is Mr. Thos. Warburton.

The master carpenters of Toronto have recently formed themselves into an association in affiliation with the Toronto Builders' Exchange. Mr. John Hanrahan is the president of this new association, and Mr. George Henry is the vice-president. An executive committee was appointed comprising these gentlemen and five other members of the association.

Henry D. Ludden, for the last sixteen years city engineer of Detroit, Mich., died in that city, August 17. He was born in 1837, and was studying civil engineering in St. Louis when the civil war began. He enlisted in a Michigan infantry regiment, and was soon appointed sergeant. Before the close of the war he had been commissioned captain, and had won considerable reputation as a military engineer. When the war was over he joined the engineering staff of the Wabash system, and about 25 years ago he entered the service of the city of Detroit.

The memorial to the late Father Luke Rivington in the new Westminster Cathedral, will take the form of an exact replica of the famous statue of St. Peter in his chair, which is in St. Peter's at Rome.

LEGAL INTELLIGENCE.

Assault on a Clerk of Works.—At Uttoxeter Petty Sessions, on Wednesday week, John Thompson, labourer, on bail, was charged with assaulting R. W. G. Hayward, architect, of Nottingham and Rocester, Staffs. Prisoner pleaded guilty. Mr. Hind, in opening the case, said that the prisoner was employed on the Abbotsholme Schools, and Mr. Hayward, who was acting as clerk of works, had frequently to condemn material and work. This had caused a great deal of friction, and his client had frequently been threatened in consequence by the prisoner and his foreman, a man named Tranter—amongst other threats, that they would do for prosecutor, and set trap scaffolds for him. The prisoner Thompson was, as he had admitted when taxed by the prosecutor, the tool of the foreman Tranter, who had boasted of his intention to pay any fine that was inflicted by the bench up to £20. On Aug. 20 prisoner was abusive and threatening to the prosecutor, who, however, treated the matter lightly. On the 21st prisoner on leaving the works went into the bar parlour of the Cross Keys, Rochester (where he knew prosecutor was in the habit of going), was supplied with ale, and called for more, but the landlord refused to supply him. Prisoner accused prosecutor of being the cause of the landlord's refusal, and left. When prosecutor was proceeding home he knocked him down twice, and kicked him on the head and body until bystanders checked him. Two men named Moss and Jones, employed on the schools as timekeeper and mason respectively, stood by during the assault, and never attempted to restrain the prisoner from using any further violence. Prosecutor and other witnesses having confirmed this statement, prisoner was sentenced to two months' imprisonment with hard labour.

In re Joseph Tappin.—The debtor was described as a timber and brick merchant, of Hill House, the Hill, Ilford, and also of Rayleigh, Essex, and a sitting for public examination was held on Tuesday before Mr. Registrar Hope. The statement of affairs showed liabilities £19,807, of which £3,418 were unsecured, and assets £831. It appeared that the debtor commenced business as a timber merchent in 1893, without capital, and he had also been interested in building operations. He attributed his failure to bad debts (£1,000), to law costs (£1,500), and to pressure by creditors during the last six or seven months. The examination was adjourned to enable the debtor to furnish further accounts.

The London County Council and the Housing Question.—In the Metropolitan Tribunal of Appeal, sitting at the Surveyors' Institution, Westminster, and composed of Messrs. Arthur Cates, president; A. A. Hudson, legal adviser; and J. W. Penfold, an important appeal against a decision of the London County Council was heard. The appellant was Lord Llangattock, lord of the manor of Walworth, for whom Mr. W. C. Ryde was counsel, and Mr. Seager Berry appeared for the London County Council. It appeared that some time ago Lord Llangattock decided, after acquiring certain leases of houses in Nursery-road, Walworth, to pull them down and on the site to build high-class dwellings for the artisan classes. He also proposed so to deal with a vacant piece of land fronting the houses at present standing in Nursery-road, and, in consideration of certain concessions under the London Building Act, 1894, he agreed to give up some land for the public use. Plans for the proposed alterations and buildings were sent to the County Council, but that body refused its sanction, and the case went to appeal. The tribunal did not then see their way to pass the plans for the original scheme, but granted an adjournment for one of a more complete and comprehensive character to be prepared. On Wednesday Lord Llangattock's agents presented the plans for the new scheme, and after statements and evidence on either side, the tribunal upset the decision of the County Council by granting the appeal, subject to certain conditions being complied with.

Mr. Charles Barter, a well-known builder of Southampton, died last week at his residence in High-street, Shirley, aged 58 years.

The Bishop of London has recommended to the Ecclesiastical Commissioners that, out of the proceeds of the sale of the site and materials of St. Michael, Wood-street, City, a new church should be built in the district now known as St. Andrew-in-the-Marsh, East Greenwich.

The Great Western Railway engineers have reported favourably on the Swansea main line scheme, estimated to cost half a million. The Cockett tunnel is not expected to be ready for passenger traffic till Christmas.

A new Baptist chapel is being erected at St. Austell from the designs of Mr. F. C. Jury, architect, St. Austell, and a special consideration is being given to the ventilation, which will be carried out on the Boyle system.

Our Office Table.

There will be an important collective exhibit at the forthcoming Paris Exhibition, representing the fire-resisting materials, systems of construction, and appliances of Great Britain. The arrangement of this collective exhibit (the first of its kind) is in the hands of the British Fire Prevention Committee, to whom the Royal Commission has allotted the necessary space gratuitously, recognising the national importance of the idea, and the disinterestedness of the effort being made by the committee to show what the country can produce in this direction. Mr. Frederick R. Farrow, F.R.I.B.A., chairman of the commercial section of the committee, has kindly undertaken the direction of this collective exhibit, and it has been decided that all applications from all British and Colonial firms to be represented in this national exhibit must reach the offices of the committee by Oct. 7. The committee itself will exhibit a model of its testing station, specimens of reports, and the like.

The excavations at Waverley Abbey, the first of the Cistercian abbeys founded in England, which were commenced last year under the superintendence of the Rev. T. S. Cooper, one of the secretaries of the Surrey Archæological Society, have been continued during the summer months with satisfactory results. The main object of the society is to obtain a complete ground plan of the abbey buildings, which covered a considerable area; and in this, if funds are forthcoming to enable them to complete the excavations, they are likely to be successful. Considerable progress has been made in this direction during the past four or five months, the excavations, which have been almost entirely confined to the infirmary block, resulting in the tracing of the south wall for 112ft. and the west wall for about 80ft. Another wall was discovered running northwards, and this was uncovered, forming an oblong block of 112ft. by 80ft. The block was found to contain a number of small rooms and yards, the use of which it is difficult to determine at present. In one of the rooms were found the bases of five small pillars, similar to those discovered last year in the cloister, resting on tile foundations. The infirmary kitchen has been ascertained, and the remains of a gateway opening into a courtyard. Some of the old lead pipes through which water from the St. Mary's well was conveyed to the abbey were found. The pipes are laid in lengths of 12ft., with collars at the junction, and form part of the system of supplying water to the abbey, which was carried out by Brother Symon in the 13th century.

With reference to the recent discovery of tesselated pavement at Dorchester, Mr. J. J. Foster writes asking who is responsible for the protection of the adjoining Roman amphitheatre. Is it, he inquires, the concern of the Duchy of Cornwall, whose land surrounds the amphitheatre? Can the Corporation of Dorchester protect it? or ought one to invoke General Pitt-Rivers, the inspector of ancient monuments, seeing that the amphitheatre is in danger of defacement, if not permanent injury? Until quite recently Dorchester may be said to have been contained within its "walks," avenues of trees following the lines of the old walls of "Durnovaria," and to this fact may be attributed the admirable preservation of the amphitheatre, which stood without the walls of the Roman station; but now the increase of the town has led to its spreading out and over Fordington Field (a perfect example, by the way, of the "open-field" cultivation of our ancestors), so that whole streets are now being built beyond the amphitheatre, which will soon be surrounded with houses. Herein lies the danger to which is called the attention of archæologists and of Dorchester folk before it is too late. The footpath made across the amphitheatre, between the new cottage and the town, spells mutilation to "Membury Rings" (as it is locally called), for the path already made across it grows wider and wider. This Roman arena is an heirloom which should be jealously protected, for it is not to be matched at Silchester, or Colchester, or any other "chester" in England. We are glad to learn that during the present week the corporation of Dorchester have decided to enter into communication with the proprietors of the land on which the Roman pavement was recently found with the view of securing it from being built over.

The urban council of Dundalk begin to fear that they have driven away the goose—in the form of H.M. Office of Works—that lays the golden eggs. Some time since the council, then known as the town commissioners, were asked by the Office of Works to lease ground adjoining the town-hall for a post-office. They asked—for Dundalk—what was considered an exorbitant sum, and also stipulated that the façade of the new building should be of stone, and should harmonise in style with the town-hall. Plans were prepared by the Board of Works and courteously submitted to the town commissioners, who, after obtaining some alterations in the designs, congratulated themselves on securing more than they expected both as regarded architecture and accommodation, the money to be expended by the Government being about £7,000. But a section of the commissioners demurred to the grant of a right-of-way to the post-office employés through the yard at the back of the town-hall, fearing that the mail-cart drivers might some quiet evening run off with the road-roller or the steam crusher. Then a long delay ensued, and in May last Mr. Matthew Comerford, the surveyor to the new urban council, wrote asking that amended plans of the post-office might be submitted to his authority. H.M. Office of Works declined to do so, and have since invited and obtained tenders for a totally different building to that provisionally approved by the authority, who have ascertained, much to their chagrin, that the post-office will be located in a by-thoroughfare, Clanbrassil-street, and will be a plain brick structure.

The syllabus of lectures in the Engineering Department of the City of London College, White-street, Moorfields, conducted by Professor Henry Adams, has just been published. The session, the 52nd of the college, opens on Monday, the 25th inst., and the subjects taught in the classes include practical sanitary science, sanitary engineering, civil engineering, mechanical engineering, quantity surveying, valuation, land surveying, theodolite work, town surveying, the laying out of building estates, &c. The fees to non-members of the College range from 7s. to 40s. for the term, and a number of prizes, including medals, scholarships, studentships, and exhibitions are offered. Mr. Henry Adams's popular and clearly-written handbooks are in themselves excellent testimonies to his teaching powers, while further proofs of his success are given by the long list of awards gained by his students during the past thirty years.

In a leaderette advocating the "signing" of his buildings by the architect who designed it, a mode of professional advertising that we are pleased to see is falling more and more out of favour in England, the *American Architect* says:—We feared that the Society of Architectural Ironworkers were doing an ill turn to Mr. Gilbert, the architect of the building, when they affixed their bronze tablet on the Tower Building declaring it was the first real instance of the "skeleton construction," and already his difficulties have begun. Mr. W. H. Birkmire, of New York, an authority on architectural iron-construction, writes to the *New York Times* declaring, first, that the honour of the invention belongs to Mr. Jenney, of Chicago, and, second, that he himself, and not Mr. Gilbert, worked out the method of construction actually employed in the Tower Building. In his reply, Mr. Gilbert traverses this statement; moreover, he makes a distinction between the "cage construction," as first employed in Chicago, and the "skeleton construction," as now used, and if the matter is one of terms merely, the precisian must admit that his position is well taken.

In his description of the evolution of his solution of his problem, Mr. Gilbert gives, our Transatlantic contemporary adds, a very pretty illustration of how architects have now and then to whip the devil round the stump—that is, to evade the spirit of fixed building-laws while obeying its letter. Finding that the building-law, if followed to the letter, would in so high a building require walls of such thickness in the lower stories that on so narrow a lot there would be left no rentable space of value, he saw that a new method of construction must be devised; but the law would admit of no new methods of construction. He then perceived that the formulas regulating the thickness of the wall only had application after the top of the "foundation" was reached, therefore he argued, "I can build my 'foundation'—after any method that pleases me—seven or eight stories high and then begin my walls, and, with only a few more stories to add, the wall as called for by the law will not be so thick as to absorb all the space." His application for a permit to build, with a foundation of such an abnormal height, he declares was granted and the building so built. A precisely similar instance occurred in another American city where an architect brought to the building inspector his drawings and his application for a permit to build a stone church. The application was rejected, the inspector pointing out that a new law that had just taken effect called for fireproof floors in brick and stone churches. The architect was in a quandary; his clients required a stone church, but they could not afford a fireproof floor. After the lapse of some days and much studying of the letter of the law, the architect again presented his drawings and specifications, absolutely unchanged, to the inspector, and modestly asked for a permit to build a "frame church with stone underpinning." In spite of the fact that the "underpinning" reached from ground to eaves, and filled both gable-ends, the inspector ruled that the letter of the law was observed, and issued the permit.

The old Suspension Bridge across the Merrimack River, about three miles above Newburyport, Mass., is to be strengthened according to the plans of Mr. W. Hildenbrand. It comprised originally two arch spans, built in 1792 by Timothy Palmer. After a series of repairs amounting to entire reconstruction, the present structure was finished. It has two independent roadways 15½ft. wide, each supported by two sets of chains, with three chains to a set. The span is 244ft. between the bearings on the towers, which are timber frames covered with boards and shingles. The original construction of the chains was of links about 2ft. long, made of iron bars 1in. square. For about 6ft. over the bearings on the towers, each chain is spliced or replaced by three smaller chains with links about 1ft. long of about ½in. square iron. The floor is hung from these chains every 7ft. by suspenders, formed indifferently of bars 1in. square, straps 2½in., or pieces of chain. The chains have been repaired in many places with links of different sizes. The local traction company proposes to double the strength of one roadway, and stiffen it.

THE ARCHITECTURAL ASSOCIATION.
The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, at 6.30 p.m., and the STUDIO OPENS on TUESDAY, October 10th, at 6.30 p.m.
A Pamphlet, giving full information, and nomination forms for Membership, may be obtained on application to the SECRETARY, No. 56, Great Marlborough-street, W.
G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

The Society of Architects.
Founded 1884. Incorporated 1893.
ST. JAMES'S HALL, PICCADILLY, W.
An EXAMINATION in ARCHITECTURE and BUILDING CONSTRUCTION, &c., will be held on the 11th, 12th, and 13th of OCTOBER, 1899.
Gold, Silver, and Bronze Medals are awarded under certain conditions.
The latest date for entering is SEPTEMBER 20th, 1899.
Syllabus free. Copies of last Examination Papers, 1s.
C. McARTHUR BUTLER, Secretary.

William Morris had a great horror of being buried under a marble slab, and though a costly monument is raised at his grave at Kelmscott, the grass grows green over his remains. The monument is raised high above the grave, and there is a space for the grass beneath. There is no long inscription—merely the two words, "William Morris."

Dr. S. W. Wheaton held an inquiry at Leeds, yesterday (Thursday), on behalf of the Local Government Board, relative to the application of the Leeds Corporation to borrow £21,250 for the purchase of Killingbeck Hall estate, as a site for the new small-pox hospital.

An inquiry was held at Dundalk on Friday last by Mr. Cowan, Local Government Board inspector, into an application for sanction to the following loans, applied for by the urban council:—£17,206 17s. 9d. to carry out a scheme under the Housing of the Working Classes Act; £1,400 for the purchase and improvement of premises for the free library; £800 for the improvement of the town-hall; £500 for stalls in Exchange-yard; £150 also for stalls, and £150 for fire-escape appliances.

The town council of Rochdale have decided to raise the salary of Mr. S. S. Platt by £100 a year, on condition that he shall withdraw his application for the borough surveyorship of Bolton, for which he was one of the two selected candidates. To this Mr. Platt has agreed.

Trade News.

WAGES MOVEMENTS.

Birmingham.—The question of increasing the minimum rate of wages and of introducing certain new conditions of work in the cabinet-making trade was discussed on Friday at a joint meeting of representatives of the employers and the men's trade societies. The men requested that the minimum rate of wages should be increased from 8d. to 8½d. per hour, or 38s. 3d. per week, and that certain new rules should be put into operation, the alternative being the handing in of notices on the day following the conference. The rules were discussed one by one, and points were conceded on each side. Concerning the wages, the employers at first offered to give the advance on January 1 next, instead of at once, as the men originally asked; but a middle course was adopted, and it was decided that the increase should come into operation on November 6.

Inverurie.—A dispute has arisen between the United Operative Masons' and Granite Cutters' Union (Inverurie Branch) and a local firm who have refused to sign the operatives' by-laws, although all the other employers' in the district have signed them. The firm, it is said, give no reason for their refusal. The men have consequently left work.

Manchester. — The dispute between the plasterers' labourers of Manchester and their employers, which has lasted since last March, was settled at a joint conference held on Wednesday. The demand of the workmen was for a halfpenny an hour advance, and the employers at their last conference offered a farthing an hour at once and another farthing in six months. This offer was refused, but in the mean time the operatives decided to accept it, and a final agreement was come to on Wednesday on the terms suggested by the employers. The operative plasterers have obtained an advance of a halfpenny per hour at once and another halfpenny in six months.

CHIPS.

A newspaper published at Kansas City states that an order has been given for 500 million feet of Southern yellow pine for the construction of the Cape to Cairo Railway. The timber is to be furnished within two years. It is the largest single order known in the history of the lumber trade.

The Easingwold Rural District Council adopted, on Friday, a scheme for supplying water from the Hambleton Hills to ten villages in the district, containing an aggregate population of 3,625, at a cost of £15,628 12s. 1d.

At Boston, Lincs, on Friday, Fred Gray, 43, carpenter, Boston, was fined £10 and £2 9s. costs for stealing three floor-boards value 4s. 3d., the property of Mr. J. Lucas, builder, Boston. He had been in the employment of the prosecutor for thirty years.

Mr. E. A. Sandford Fawcett, A.M.I.C.E., Local Government Board inspector, attended at the Guild Hall, Conway, on Friday, for the purpose of holding an inquiry in reference to the application made by the Conway and Colwyn Bay Joint Water Supply Board for sanction to borrow £30,000 for the purposes of their undertaking.

The new town-hall at Newcastle, Natal, has just been opened. It has been built from plans by Mr. William Lucas, of Pietermaritzburg, the contractors being Messrs. Bruce and Miles, and the cost has been over £5,000.

At Wednesday's meeting of the city council of Liverpool, the tramways committee were granted authority to reconstruct the lines for electric traction from Old Haymarket, along Victoria-street and North John-street, to Lord-street, at an estimated cost of £4,284 for permanent way and paving, and £729 for overhead electric equipment. At the same meeting a tender was accepted for the erection of an electric power station in Lister-drive for a sum of £49,783, and another was taken for the supply of three engines at a cost of £6,939 each and three at £1,377 each, for the Lister-drive and Cobb's Quarry electric stations.

Colonel A. J. Hepper, of the Local Government Board, held an inquiry at the town-hall, Leamington, on Friday, into the application of the town council for permission to borrow £1,300 for works of sewerage in the borough. The statements made by the town clerk (Mr. H. C. Passman) and the borough surveyor (Mr. W. de Normanville) were that the loan was required for laying new sewerage mains to replace old mains which had become dangerous, and had occasionally fallen in. These old mains were in the form of brick sewers, and were laid by the old commissioners. It was also proposed to lay a new sewer on the Cubbington-road. The sewage of the town was disposed of on the broad irrigation principle on Earl Warwick's farm at Heathcote, where 275 acres were in use.

LIST OF COMPETITIONS OPEN.

Dumfries–Public Library		John Grierson, Town Clerk, Dumfries	Sept. 15
Workington—Town Hall, Oxford-street (Assessor)	£40 (merged), £20, £10	W. L. Eaglesfield, Borough Surveyor, Workington	,, 15
Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	,, 16
Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	,, 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	,, 30
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	Oct. 17
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—

LIST OF TENDERS OPEN.

BUILDINGS.

Stronachlachar, Loch Katrine—Reconstructing Invergyle House	Glasgow Corporation	James M. Gale, Engineer, City Chambers, 45, John-street	Sept. 9
Brinscall, Lancs—Store and Two Houses, School-lane	Withnell Co-operative Society	John B. Thornley, Architect, Market-street, Darwen	,, 9
Keswick—Additions to St. John's-in-the-Vale Vicarage		J. H. Martindale, Architect, Viaduct Chambers, Carlisle	,, 9
Cork—Rebuilding 24, Parnell-place	J. A. Arnett and Co., Ltd.	James F. McMullen, M.S.A., Architect, 30, South Mall, Cork	,, 9
Parkgate—Nineteen Dwelling-Houses, Netherfield-lane	F. Mason	J. Platts, Architect, Old Bank Buildings, High-street, Rotherham	,, 9
Hoyland—Wesleyan Minister's Residence		John W. Wilson, Architect, 171, King-street, Hoyland	,, 9
Gorey, Ireland—Additions to Workhouse	Guardians	R. Creighton, Clerk, Board Room, Gorey, Ireland	,, 9
Cork—Rebuilding 12, Bridge-street		James F. McMullen, M.S.A., Architect, 30, South Mall, Cork	,, 9
Otley—Additions to Shed, Barras-lane	Waite and Saville, Ltd.	Fairbank and Wall, Architects, 3, Manor-square, Otley	,, 9
Botriphnie, N.B.—Free Church Manse		R. B. Pratt, A.R.I.B.A., County Bank House, Elgin	,, 11
Macclesfield—Enlargement of Porter's Lodge	Guardians	The Workhouse Master, Union Offices, Macclesfield	,, 11
Barry—Smallpox Hospital	Urban District Council	J. C. Pardoe, A.M.I.C.E., Holton-road, Barry, Glam.	,, 11
Nether Haugh—Alterations to Mission Room		J. Platts, Architect, Old Bank-buildings, High-street, Rotherham	,, 11
Lincoln—Additions to Offices	Robey and Co., Ltd.	W. Watkins and Son, Architects, St. Edmond's Chambers, Lincoln	,, 11
Barnstaple—Restoration of Penrose Almshouses	Charity Commissioners	Fredk. W. Potter, A.R.I.B.A., M.S.A., Barnstaple	,, 11
Wallington—Detached House		S. G. Pailthorpe, Architect, 50, Finsbury-square, E.C.	,, 11
Bakewell—Infirmary	Guardians	E. M. Longdon, Architect, Town Hall, Bakewell	,, 11
Bettws Garmon—Farmhouse		Bowen and Jones, Architects, Carnarvon	,, 11
Exmouth—Alterations at the Bungalow, Claremont-terrace	Mrs. Pearse	Ernest E. Ellis, Architect, Market-street, Exmouth	,, 11
Ambleside—New Royal Lake Hotel, Waterhead		J. W. Grundy, Architect, Central Buildings, Ulverston	,, 11
Llanelly—Engine House, &c.	Navigation Commissioners	C. P. Fowler, Resident Engineer, Town Hall, Llanelly	,, 11
Cork—Additions to Fermoy House		W. H. Hill and Son, Architects, 28, South Mall, Cork	,, 11
Kendal—Shop, Warehouses, &c., at Endmoor	Co-Operative Society, Ltd.	John Stalker, M.S.A., Architect, 57, Highgate, Kendal	,, 12
Bromley—Additional Accommodation at Asylum, Devon's-rd.	Poplar & Stepney Asylum Managers	J. and S. F. Clarkson, Architect, 136, High-street, Poplar, E.	,, 12
Warlingham, Surrey—Superstructure of Lunatic Asylum	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	,, 12
Bradford—Reflooring and Roofing Shed, Canal-road		Milnes and France, Architects, Bradford	,, 12
Bournemouth—Additions to Engine-House	Town Council	F. W. Lacey, Borough Engineer, Town Hall, Bournemouth	,, 12
Ebchester—Boathouse	Rowing Club	The Chelmsford Hotel, Ebchester	,, 12
Bradford—Shed, Canal-road		Milnes and France, Architects, Bradford	,, 12
Selly Oak—Casual Wards in Workhouse Grounds	King's Norton Union Guardians	C. Whitwell and Son, Architects, 23, Temple-row, Birmingham	,, 13
Bermondsey, S.E.—Alterations to Town Hall	Vestry	The Surveyor, Town Hall, Bermondsey	,, 13
Middleton St. George—Additions, Ropner Convalescent Home		J. Mitchell Bottomley, Architect, 28, Albert-road, Middlesbrough	,, 13
Hambleton—Six Houses and Shop	Anson Bros.	Arthur Hartley, Architect, Carlton Chambers, Castleford	,, 13
Middlesbrough—Office Accommodation at Goods Warehouse	North-Eastern Railway Co.	William Bell, Company's Architect, York	,, 13
Great Horton—Three Houses and Shop, High-street		Sam Spencer, Architect, 344, Great Horton-road, Great Horton	,, 13
Dukinfield—Offices, &c., at Disposal Works	Joint Sewerage Board	J. Newton, Son, and Bayley, Engineers, 17, Cooper-st., Manchester	,, 13
Hull—Club Premises, High-street	The Pacific, Ltd.	B. S. Jacobs, Architect, Bowlalley-lane, Hull	,, 13
Dewsbury—Restoration of Board Schools		Frederick W. Ridgway, F.R.I.B.A., Dewsbury	,, 13
Shildon—Fifty-seven Houses	North-Eastern Railway Co.	William Bell, Co.'s Architect, Central Station, Newcastle-on-Tyne	,, 13
Pontardawe—Enlargement of Zoar Methodist Chapel		W. W. Williams, Architect, 63, Wind-street, Swansea	,, 14
Tweedmouth—Block of Dwelling-Houses	W. S. Dods	J. Lorimer Miller, Architect, 39, Hide Hill, Berwick-upon-Tweed	,, 14
Huddersfield—Additional Classrooms to Wesleyan Schools	Trustees	John Kirk and Sons, Architects, Huddersfield	,, 14
Bures St. Mary, Suffolk—Kiln		G. H. Page, F.I.A.S., Architect, Trinity Chambers, Colchester	,, 14
Hurstpierpoint, Sussex—Cemetery Works	Parish Council	H. W. Beach, Perrymount-road, Hayward's Heath	,, 14
Greenwich—Repairs to Casual Wards	Guardians	T. Dinwiddy, 12, Croom's Hill, Greenwich, S.E.	,, 14
Silsden—Vicarage House		W. and J. B. Bailey, Architects, 1, Scott-street, Keighley	,, 14
Hope, Lancs—Planing Floors of Union Infirmary	Salford Union Guardians	F. Townson, Clerk, Union Offices, Eccles New-road, Salford	,, 14
Thornbury—Infirmary at Workhouse	Guardians	G. H. Oatley, Architect, Baldwin-street, Bristol	,, 15
Brentwood—Additions to Essex Lunatic Asylum		Widnell and Trollope, 20, Tothill-street, Westminster, S.W.	,, 16
Thornhill—Infants' School	Rotherham School Board	J. E. Knight, Architect, 33, College-street, Rotherham	,, 18
Carlisle—New Vicarage, Irthington		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	,, 18
Preston—Public Abattoir at Cattle Market	Corporation	The Borough Surveyor, Town Hall, Preston	,, 18
Bradford—Enlarging Tyersal School	School Board	E. P. Peterson, F.S.A., Architect, 48, Sunbridge-road, Bradford	,, 18
Skipton—Enlargement of Craven Bank		John Varley, C.E., and Son, Architects, Skipton	,, 18
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	,, 18
Gwennap—Additions to St. Day Schools	School Board	S. Hill, Architect, Redruth	,, 18
Leeds—Wood Floor and Staging to Swimming Bath		The City Engineer's Office, Municipal Buildings, Leeds	,, 19
Didsbury—Police Station	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	,, 19
Littlestones, Kent—Coastguard Buildings	Admiralty	The Coastguard Station, Littlestones, Kent	,, 19
Silloth—House and Shop	D. Over	Geo. Armstrong, Architect, 24, Bank-street, Carlisle	,, 20
Manchester—Alterations at Leaf-street Baths	Baths Committee	The City Surveyor, Town Hall, Manchester	,, 20
Long Melford—Fireproof Strong Room		Fisher and Steed, Solicitors, Long Melford, Suffolk	,, 20
Pontypridd—Workhouse and Boundary Walls at Llwynypia	Guardians	E. C. Spickett, Clerk, Pontypridd	,, 23
Clones—Schools		T. Elliott, Architect, 38, Darling-street, Enniskillen	,, 25
South Shields—Additions to Westoe-road Board School	School Board	Fred. Rennoldson, Architect, 37, King-street, South Shields	,, 26
Paddington, W.—Alterations to Woodfield House, Woodfield-rd.	Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	,, 27
Staines—Infant School, Stanwell-road	School Board	Murray & Dibdin, Architects, 5, Hurstbourne-rd., Forest Hill, S.E.	,, 28
Salford—Encaustic Tiling at Town Hall		The Borough Engineer's Office, Town Hall, Salford	,, 28
Hereford—Renovations at Sergeant's Cottage	Standing Joint Committee	Alfred Dryland County Surveyor, Hereford	,, 29
Margate—Coastguard Buildings	Admiralty	Director of Works Dept., Admiralty, 21, Northumberland-av., W.C.	,, 29
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	,, 30
Erith, Kent—Central Schools (1,260), West-street	School Board	W. Egerton, Architect, 12, Queen's-road, Erith, Kent	Oct. 2
Handsworth, Staffs—Stabling, &c.	Urban District Council	E. Kenworthy, A.M.I.C.E., Council House, Handsworth, Staffs	,, 2
Lewes—Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	,, [illegible]
Tooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	,, 11
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	,, 12
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Selby—Alteration of Premises	Yorkshire Banking Co., Ltd.	James Young and Co., Architects, 62, Market-street, Bradford	—
Leeds—Alterations to General Infirmary		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Dewsbury—Restoration of Schools	School Board	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
New Tupton—Church Institute, Sunday-School, and House		Ernest Oxley, M.S.A., Architect, Clay Cross	—
Chepstow—Rebuilding 29, High-street	C. Curtis	W. Robinson, Architect, King-street, Hereford	—
Tooting, S.W.—Flats		J. Theobald, Architect, 26, Budge-row, Cannon-street, E.C.	—
Morecambe—Altering House into Business Premises	Lancaster and Skerton Co-op. Soc.	Marshall Bros., Architect, Back-crescent, Morecambe	—
East Kirkby—Extension to Co-operative Premises		Lawrence Bright, Architect, 9, St. Peter's Church-walk, Nottingham	—
Cainscross—Extensions to Bakehouse	Cainscross and Ebley Co.-op. Soc.	The Society's Office, Cainscross, Glos.	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Great Bentley—Four Cottages at Holly Bush Hill Brickworks	J. Girling	J. W. Start, F.S.I., Architect, Colchester	—
Bradford—Six Houses and Shop		James Young and Co., Architects, 62, Market-street, Bradford	—
Nottingham—Additions to Workhouse, Beech-avenue		A. H. Goodall, Architect, 14, Market-street, Nottingham	—
Watford—New Offices and Warehouse	Benskin's Watford Brewery, Ltd.	Chas. P. Ayres, Architect, 14A, High-street, Watford	—
Bradford—Offices, &c., at Globe Foundry, Whetley Hill		F. Moore, Architect, 40, Sunbridge-road, Bradford	—
Tuxford—Fifteen Houses		Flockton, Gibbs, and Flockton, 15, St. James's-row, Sheffield	—
Killinghall—Cottage	Miss Powell	Bland and Bown, Architects, North Park-road, Harrogate	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Usworth, Durham—Forty Houses, Douglas-terrace		Little and Browne, Architects, Mossley-street, Newcastle	—
Consett—Two Engine Houses	Consett Iron Company, Ltd.	The Engineer's Office, Consett, Durham	—
Bramley—Two Shops and Nine Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Stalybridge—Branch Bank		John Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	—
Fornham, Suffolk—Kiln and Malt Store at Malting	Lady Cullum's Trustees	Ernest Pritchett, Hardwick Estate Office, Bury St. Edmunds	—
Wallsend—Branch Premises		The Industrial Co-operative Society, Ltd., Wallsend	—
Tunbridge Wells—Parish Room and Institute, St. John's		H. H. & E. Cronk, Archts., Mount Ephraim-rd., Tunbridge Wells.	—

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PROFESSIONAL GROOVES.

MAN has been described as a creature of habit; Herbert Spencer also speaks of "professional bias," meaning the tendency of certain professions, like the military, the medical, and the theological, to see and regard things with a particular prejudice or warp of mind, and in the same manner we may apply the term to describe certain architectural habits or bents of mind which tend to "crystallise" or fall into grooves. These "grooves" are not, when taken together, objectionable tendencies: they are inevitable as local and partial habits of regarding buildings, and are prejudicial only when they become narrow, and where those who fall into or pursue them can see nothing good in other habits of thought. It is the same with every other subject or profession: there are two or even more ways of looking at it, and it is because of this that so many of our disagreements and controversies arise. And yet both views may be perfectly reasonable and correct, because each sees what the other does not or cannot. One man looks at it from one side, another from an opposite point of view, and so on; but they each see the same object, though on different sides, and if they could both understand that their joint views are more truthful than their individual impressions, all difference would be avoided. We may illustrate this principle by referring to a few "grooves" of professional work. And first we take country and town practice. The country practitioner sees his work from quite a different point of view to the town practitioner. His vocabulary is restricted. He has been educated and trained in a small town, where certain local traditions and customs obtain; during his youth he has been brought into contact with certain local materials, and with workmen who do work in a particular way of their own, and these conditions shape his ideas, and in time form his prejudices. He falls into a groove, and naturally sees things in a particular kind of way. His ideas of house-building have been formed upon a few local models, examples of a very modest or inferior type; his plans are of regulation order; he has a certain idea as to elevations and roofs; every feature is modelled according to a few recognised patterns; gables and bay windows, even the dressings of the windows and doorways, conform to a local style as cramped and meagre as his own views. Of course, the material of the locality has restricted his invention to a few channels, and these have become "cribbed, cabined, and confined" by a repetition of the same methods of working. After a time, any departure from them would be regarded as apostasy; the local builders would resent any change or variation, and the architect himself falls into a passive way of following. Walls, windows, doors, roofs, chimneys, even the ornament that is used, have all a certain form of their own in his eyes, from which it would be wrong to depart. Having "cut his teeth" on the local style, it is extremely hard to see things in any other way. The material, whether it is brick or stone, has its restricted limitations, according to the custom of the place. In a small town removed from any centre of style, the buildings are parsimonious and meagre in the extreme; in some towns on the South Coast, for example, a very limited vocabulary prevails—it looks all the work of a builder, plain and unattractive, walls with oblong apertures and flat arches, eaves-gutters and parapets, plain slated roofs, and very ordinary details. In another town the style is more elastic and attractive; there is a free treatment of window gables, half-stucco or timber, high pitched hip roofs of red tile. Compare, for instance, Cowes and Southampton with Eastbourne or Folkestone, all brick localities, as showing diversity of practice: one restricted, the other free. These variations represent the provincial architect under different conditions of practice. The woodwork finishings tell the same tale. Here we see the same barge board, the same sash or casement and door; the architect and builder work in a groove. There we meet with a more pleasing and elastic treatment, where, perhaps, a London architect has introduced a better style. When we turn to town practice, there is a wider gamut, so to speak, of expression, a wider range of ideas. The groove is not so narrow—the range of style is more varied and intermixed. There is a blending of styles: yet we see certain habits and idiosyncrasies amongst them of men who have learned one style, who show the traditions of a certain leader of men, who have stereotyped forms, who have been office-trained, but little practical knowledge of material. In short, the groove of town practice is marked by a conventional manner. The buildings are less solid and substantial, though they have a greater variety of external expression. The town architect is, perhaps, not so observant of material, his stone and brick details are less stereotyped, and often rather "mixed"; we may often see a stone moulding that would be better in wood, a terracotta one more suitable for stone; but the designer is not so rigid and narrow in his interpretation of material as the country practitioner is, and he pays attention to the amenities of style.

Leading architects in our larger towns—London in particular—are more or less specialists, and follow grooves or "lines" of their own. They do church or domestic work, take up municipal buildings, theatres, hospitals, baths, schools, and, though they often vary their practice, the influence of their groove is to some extent prejudicial to them in other branches. We know a few ecclesiastical architects who cannot design residence or office buildings with any success. But this inability is more strongly marked with regard to men who have become specialists in hospital work or in baths and washhouses. The specialised practice is so very exacting and precise, that it leaves little time for other branches. More order and discipline are necessary than in an all-round practice, because every minute arrangement has to be mastered; the architect has to learn a variety of details, to study Blue-books, Government instructions, Local Government Board reports, and special treatises. Specialism very soon finds its own groove. In the planning of a hospital or a school the requirements are regulated and precise; the cubic space to be allowed to each patient and bed; the position and detail of every part of the ward, even the construction of the windows, and the warming and ventilating requirements — all these are absolutely defined. The school expert has to be precise in his knowledge of the Elementary Education Department requirements: the floor space to be allowed to each pupil; the arrangement of the desks; the regulated dimensions for each seat; the position of the windows as regards light; class-room, cloak-room, and playground provision. These are matters that soon fall into regulation order. Even the elevation assumes a distinct character of its own, which renders the designer of such work incapable of turning his hand to other kinds of design. The details are of a special kind too. Other departments of practice are found in our large towns, and these all have particular characteristics. There is, for example, the designer of commercial buildings, shops, warehouses, offices; and to be successful in any one of these the practitioner must confine himself to that particular branch of work.

Another broad distinction is that between building and art, or between the practical and æsthetic followers of architecture. They mark two almost opposite tendencies. Men naturally fall into these two grooves, as they are distinctive of intellectual discernment and taste. The practical mind is common in every class of life. The builder, *par excellence*, is of this class; he looks on only one side of the shield; he often sees no other, and affects to despise the artist. The profession is made up of these two classes, and it is as well that we should now and again take stock of their attributes and qualifications. During every great period of architecture these two existed, often working side by side; at others in open conflict. Phidias, Ictinus, Alan of Walsingham, and Wykeham, Wren, and Inigo Jones were builders as well as artists. The builder's groove, absolutely essential as it is, is apt to become narrow. He views stones, brick, and timber or iron, their transport, conversion, cost, and use as the Alpha and Omega of architecture. The man who puts building first and architecture second is no doubt logical in his sequence; but in these days of hard facts and mechanical invention he is apt to thwart his better judgment. The tyranny of practical building has become rather a bugbear to the architect: it exercises a kind of lordship over him; he can scarcely design a detail but he is reminded of some indiscretion in the use of the material—that it is wasteful, defective in design, and faulty in construction. In vain the architect tries to be logical in his reasons for doing this or that, but he is told the design is contrary to the exigencies of conversion and to good construction, or that it will be costly. The consequence of this tyranny is a fatal restriction to all invention—it ties and fetters him to commonplace and hackneyed modes of design.

The practical instinct is shown in all utilitarian matters; it inculcates a matter-of-fact way of building. We see it reflected in the builder's ideal of a window—the common sash window, or in the four-panel door; in the square box-like plan, with its central entrance and stairs; in the square commonplace rooms and finishings, without breaks or recesses; in the straight flight, in the flat hipped or gabled roof. The building instinct keeps things as they are; it discountenances change or variety—it is trade interest to do so, to avoid all artistic fads. It also dwells much on economy. The builder's ideal is to build without waste; but in doing so he often exhibits a sad inconsistency—a want of scientific economy;—he affects to ignore architectural considerations of design, at the same time he shows his ignorance of the essentials of good construction. His regard for machine-made joinery leads him into extravagances in things like mouldings and turned newels and balusters that are repugnant to anyone with good taste. The cheaper he can turn out mouldings, the more he uses; and it is the same with his weakness for cheap carving in stone. His craving for "art" of a certain sort is a pitiable irony of extremes meeting. He reduces the thicknesses of his framed work to expend the cost saved on a quantity of cheap ornamentation or poor ironmongery, and plumbers' fittings. All this is well known to everyone who studies our modern buildings of a certain kind.

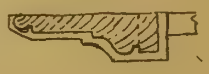
Those who pursue the groove of art (we speak of what goes under the name of "art" rather than the reality) just as often miss the object they set before them. They pursue the shadow for the substance. There are many "grooves of art." The architect with a style is apt to apply it in a variety of ways it was never intended for—to public buildings, shops, private houses, banks, and even churches, till it becomes a mere dress to clothe any building, however commonplace. He uses the same façade on different buildings, with slight alterations that do not affect the object; the same mouldings and dressings are applied to shops and commercial premises as to public offices, and his designs have a cut-and-dried character. Or the same result is observed by the mere draughtsman who furnishes elevations and perspectives. There is a "stock-in-trade" character about the work turned out. It has all the look of a professional groove about it—flimsy, unsubstantial, and meaningless for its purpose. How can buildings designed by a "ghost," a man who knows little of the requirements and nothing of the material, who lives and works in a London office, know or do anything better? Then we have the decorative artist, the designer of interior decorations, the painter and stenciller of fabrics and art furniture, who work in "grooves." They have learned art in the art school or polytechnic, have made drawings and studies of "historic styles," and submitted designs in modelled plaster for woodwork or metal, or wallpapers, and thus equipped they call themselves "decorative artists," but they are tramelled and fettered by conventions and methods. They are employed to do certain decorations at a contract price, to follow the contractor's or architect's instructions.

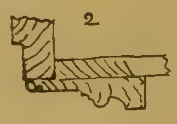
Workers and designers in materials fall into "grooves." We may instance the brick "groove," the stone "groove," and the iron "groove," each in its way more or less, compelling the designers to sink to the level of a modern machine. Manufacturing enterprise and competition have made them specialists; they become addicted to technical processes of treating these materials. The designer of iron construction is in a special manner an instance of this cramped practice. The material, rigid and intractable as it is, admits of but few modes of manufacture. It can be cast, moulded, or rolled into sections and forms, but these operations limit the resources of the designer. Very few men have been able to turn the material to an architectural use; the greater number have contented themselves to employ the stock patterns and sections, and to follow the engineer in his construction and details. The consequence is that most of our ironwork is trammelled by the limitations of the workshop. Our large railway stations, markets, piers, and pavilions afford us examples of what our designers can do, and how much remains to render these structures in a real sense honest and artistic adaptations. In all these branches of professional work we find it difficult to break through custom and habit, which tie us down to methods and procedures. That which is easiest or least costly is followed. In each groove we see excellent work in its own way, done by men who have had to contend against competitive forces; but, as one writer forcibly reminds us, there is a source of weakness rather than of strength in this division of our work into parts. Is it not turning our artists into machines or "fragments of men," making our art piecemeal and fragmentary? We can now only look to co-operation to produce a more healthful condition—a reunion of forces and ideas which now run in separate channels. Art must no longer be separated from the useful or the technical, but be regarded as the concurrence of all those forces that are now disjointed and work on contradictory lines.

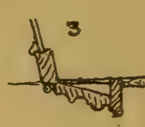
ESTIMATES.—XXI.

HARDWOOD JOINERY.—SPECIAL FITTINGS.

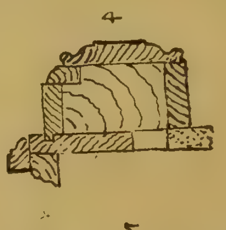
THERE are various fittings in the "Joiner" that can only be priced by reference to trade lists, such as wood chimneypieces, overmantels, office desks of pine or mahogany; school fittings, such as dual desks used in London Board Schools, convertible desks, parquetry, wood-block flooring, sliding partitions, special window sashes and casements, or church seats, benches, oak or pitch pine lecterns, prayer desks, and pulpits, and sundry other special fittings that are usually made by firms who devote themselves exclusively to these kinds of joinery, and whose work has a character and reputation for workmanship that leave little to be desired. It is better for the estimator to quote a price from such firms for the class of work required; but usually a stipulated sum is put down in the quantities. Such firms as Young and Marten, Ltd., Stratford; Walker and Co., Bunhill-row; Cox, Sons, Buckley, and Co., Tavistock-street; Jones and Willis, supply articles of this description. Special joinery is also made by several other firms advertised in the Building News. For horticultural buildings, the well-known firms of Messenger and Company, Ltd., Loughborough, and Victoria-street, Westminster; also Crompton and Fawkes, Chelmsford, undertake contracts and give estimates.

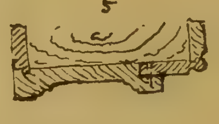


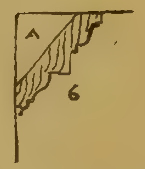




We give a few sketches for architrave mouldings, &c., showing a window-mullion finish and linings, a cornice fixed on brackets to illustrate item. On p. 288 *ante* we also show two forms of bolection mouldings (1 and 4), also a dado capping (2) of effective design. A moulding of this kind is best hand-wrought, and may be taken at 6s. per foot cube.







For pricing hardwood joinery, the estimator should obtain prime-cost prices from well-known firms, and take into consideration the extra labour, some remarks on which will be found on p. 288 in our last issue.

STAIRCASES.—*Continued (see items p. 289 ante).*

16ft. super. 1½in. moulded wall string.

This string can be got out of deal, 11in. by 1½in., say as follows:—

	£	s.	d.
1½in. deal, per foot	0	0	2¾
Planing ·010	0	0	1
Moulding	0	0	1¼
Fixing, say	0	0	2
	0	0	7

No. 8. Ramps to ditto including heading joints.

For ramps take twice the cost of straight work, or—

	£	s.	d.
If the ramps are 2ft. each, we may price each ramp at 2 × 9d. =	0	1	6
Heading joint	0	0	6
Cost of each	0	2	0

45ft. super. 1½in. cut outer-string staff-beaded.

	£	s.	d.
1½in. deal	0	0	3
Planing sides and edges	0	0	2
Cross tonguing	0	0	1
Cutting for mitres	0	0	1½
Staff-beading	0	0	0¾
Fixing	1	0	1½
Per foot	0	0	9¾

25ft. run. 4in. by 4in. newels.

4in. by 4in. is 16 sectional inches = 1⅓ inch cube, and pricing this at, say, 6s. per foot = 8d. per foot run.

No. 62. 2in. turned balusters housed to string and handrail.

	£	s.	d.
Say 3ft. of 2in. square deal	0	0	2¼
Cutting out and planing sides	0	0	2
Turning, say	0	0	3
Housing ends and fixing, say	0	0	6
	0	1	1¼

36ft. run. 4in. by 3in. Honduras mahogany handrail, moulded as per detail.

The items may be put down as follows:—

	£	s.	d.
Say 4in. super. of 3in. mahogany at 2s.	0	0	8
Sawing out and squaring up	0	0	3½
Moulding three sides, including joints and screws, say	0	1	2
Polishing, say	0	0	3
Cost per foot	0	2	4½

6ft. run. Ramped handrail.

We may price this at twice value of straight, say, 2s. 4½d. × 2 = 4s. 9d. per foot run.

The price of a deal handrail of the above size would be about 1s. per foot. According to current prices Honduras mahogany is priced from 4½d. to 6d. per square foot of 1in. thick.

MISCELLANEOUS.

12ft. super. 1½in. staff-beaded skylight curb, tongued at angles.

	£	s.	
Say 1½in. deal cost	0	0.	
Planing sides and edges (constant ·010)	0	0	
Staff-beading angles (·009), say	0	0	1
Tonguing angles (·015), per foot run, say 4ft.	0	0	1½
Fixing	0	0	2
Per foot	0	0	8½

If there is only this quantity, this item may be put at 10d. per foot super., including profit.

32ft. run. Plugging wall for framed work.

The price of this item will depend how far the wooden plugs are driven apart, according to the thickness and height of framing. If we say the plugs are 12in. to 18in. apart, the price will be about ¾d. to 1½d. per foot. By constant for plugging per foot run ·009, we may put it about 1d.

VARIOUS LABOURS.

120ft. run. Labour to groove.

The constant for this, if not more than 2in. girth, is ·003 = ½d. a foot run; if in cross-grained wood ·009 = ¾d.

20ft. run. Labour cross-tonguing joints to landings.

The constant is ·015 = 1½d. per foot.

30ft. run. Labour to tongued angles of 1¼in. deal.

The cost of this, if the tongue is worked on one side and grooved on the other, is about the same as last item, 1½d.

If a loose tongue is inserted in grooved edges, the price may be 1¾d.

22ft. run. Labour to rounding edges of 1¼in. deal shelves.

This may be put at ½d. per foot run. The constant is ·006.

If the edge is circular, add half again as much, or ¾d.

62ft. run. Labour forming chamfer 1¼in. wide.

If we take constant ·006, the price is about ½d. per foot run; but, of course, the price will depend on if the chamfer is worked cross-grain or partly in curves, as in many cases of bench ends. In this case the price should be put at ¾d. to 1d. In all such cases the constant is increased 50 to 100 per cent.

15ft. run. Labour to beaded angles.

Price this at ¼d. a foot run, and if cross-grain ½d. This price applies to 1in. beads and under.

20ft. run. Labour to tongued and staff-beaded angles, 1¼in. deal.

For tongued angles we have put down 1½d. per foot. For staff bead the constant is ·009, say ¾d., in all, 1½d. + ¾d. = 2¼d. per foot run.

If any of these items include stops, the price must be increased by one-half.

20ft. run. Allow labour for moulding 2in. girth.

Price this item at ·012 = 1¼d. per foot; if stopped add half as much.

12ft. run. Ditto labour to rebating.

If the rebate is not more than 2in. girth allow ¼d.; if more, price the same at ·048 = 4¾d. per foot super.

10ft run. Labour scribing 1¼in.

This may be priced at ¾d. or 1d. per foot run.

Other "labour constants" are to be found in Hurst's "Handbooks" and Leaning's "Notes," both for labours from bench and also for fixing. (See our remarks p. 288 *ante.*)

CASINGS, ETC.

68ft. super. 1¼in. cradling to entablature and tongued blocking.

This may be formed of rough pieces fixed at intervals of a foot, and the quantity of stuff to be framed or put together for each foot must be ascertained. For ordinary work 6d. a foot would be sufficient. For tongued blocking add another 2d. a foot.

30ft. super. Ditto in two quick circular sweeps.

Add 50 to 75 per cent. on last price according to quickness of sweep.

96ft. super. 1¼in. deal pilasters glued and blocked, and mitred angles.

	£	s.	d.
1¼in. deal	0	0	2½
Gluing and blocking	0	0	3
Planing, at ·010	0	0	1
Mitred returns	0	0	1½
Fixing	0	0	2½
Per foot	0	0	10½

48ft. super. Tapered columns, glued up in narrow widths and blocked, about 14in. diameter.

These are built up in small pieces, mitred, tongued, and blocked. The labour bevelling the pieces would be considerable. The extra items would be :—

	£	s.	d.
Labour diminishing pieces (six edges), say	0	0	1½
Bevelling edges of ditto at ·002 (say 6ft. run)	0	0	1½
Tonguing angles at ·015 (3ft.)	0	0	4½
Extra blocking, say	0	0	3
,, gluing	0	0	1
	0	0	11½

Say, 1s. per foot extra on last.

For a column of this size, 2s. 3d. per foot would be a fair price. Some estimates put 3s., including profit, &c.

48ft. super. Forming deep flutes to ditto, 1in. wide.

Add per foot super. for these 2¾d., if wider flutes, double this.

185ft. super. 1¼in. dado, with dovetailed key-joints, secured with slips and dovetails, hung to grounds by keys grooved into ditto.

The cost of deal per foot may be put at 2½d., and the labour at constant ·70 hours of joiner, would be another 7d., would be 9½d., say, 10d., or 1s. per foot. Or—

	£	s.	d.
Cost of deal	0	0	2½
Planing (·010)	0	0	1
Dovetailed keys, grooves, &c., say	0	0	3
Grounds	0	0	2
Fixing	0	0	1½
Per foot	0	0	10

(See items on p. 288 *ante*, where the items are put down for 1¼in. wrought V-jointed partition.)

MISCELLANEOUS FITTINGS, ETC.

28ft. run. 5in. by 4in. moulded cornice.

This can be prepared out of a 1½in. deal upon a backing. If machine-made, the moulding would not cost more than, say, 9d. to 10d. per foot run, if we price the moulding at 6s. per foot cube, say, 1s. per foot. (See sketch.)

No. 6. Mitres.

These may be put down at the same price each.

No. 2. 9in. by 1½in. shelves, 7ft. long each, to chimneypieces, with rounded corners, on cut deal brackets, pinned to walls, &c.

The superficial of one shelf would be 5ft. 3in.

	£	s.	d.
5ft. 3in. super. of 1½in. deal at, say, 3d.	0	1	3¾
12ft. super. of planing at 1d.	0	1	0
Rounded corners	0	0	6
Two cut brackets, say	0	1	6
Cutting brickwork and pinning edge of shelf at, say, 3d. per foot	0	1	9
Each	0	6	0¾

Including profit, &c., say 6s. each.

No. 1. 1¼in. dovetailed sink 1ft. 6in. by 1ft. 3in. and 8in. deep, fixed on bearers.

To price this, it is best to take the items separately, thus—

	£	s.	d.
Say 7ft. super. of 1¼in. deal at 2½d.	0	1	5½
Labour, say	0	3	6
Bearers, say	0	1	6
Fixing, say	0	1	0
Cost per foot	0	7	7½

285ft. super. 1¼in. panelled casing to ceiling beams, moulded outside, as per detail, grooved and tongued at angles on bracketing.

Without a detail of the panels, it is impossible to price this accurately. Say—

	£	s.	d.
Cost per foot of 1¼in. deal	0	0	2¼
Planing per foot (·010)	0	0	1
Mouldings	0	0	1½
Grooving and tonguing angles (·006), say	0	0	0¾
Cross-tonguing (·015)	0	0	1½
Rough fir brackets, say 15in. apart, fixed to beams	0	0	2
Fixing, say	0	0	2
Cost per foot	0	0	10¾

No. 1. 1¼in. super. W.C. seat and riser screwed to bearers :—

Put this at 1s. 6d. per foot.

126ft. super. 1¼in. deal casings to stanchions, tongued and moulded and fixed complete.

A detail is required for this. If the work is of ordinary kind, we may take the items as follows :—

	£	s.	d.
1¼in. deal as above, say	0	0	2¼
Planing per foot	0	0	1
Moulding	0	0	1½
Tonguing, &c., angles	0	0	0¾
Cross-tonguing	0	0	1½
Beading at angles	0	0	0¾
Putting together	0	0	2
Cut deal grounds and fillets, &c., fixed 1ft. apart	0	0	2
	0	0	11¾

Say, per foot, 1s.

36ft. run. 1in. pipe casings 9in. wide, 16in. girth, including necessary plugging, scribing, &c.

There would be 1ft. 4in. super. of deal to the foot—say, 2½d.; planing, 1d.; scribing and rebating, 1d.; beading at angles, 1d.; fixing, plugging, &c., 2d. Say, 7½d. per foot.

No. 12. Small cut brackets for shelves :— These may be priced at 6d. to 7d. each.

No. 8. Ditto, for 9in. shelves :—

Say, 1s. 2d. each.

32ft. run. Beaded capping to framing :— The price would be about 2½d. per foot.

OAK, MAHOGANY, ETC.

15ft. super. 1¼in. Wainscot window-board, cross-tongued, rounded edge, on deal bearers.

	£	s.	d.
1¼in. wainscot	0	1	4
Cross-tonguing	0	0	2½
Rounded edge	0	0	2
Bearers and fixing	0	0	3
Per foot super.	0	1	11½

One price-book puts this down at 2s. 11d.

32ft. super. 1¼in. Wainscot splayed window linings, panelled and moulded.

These may be put down at 3s. per foot.

16ft. super. 1¼in. ditto, panelled and moulded both sides, front shutters, three panels high.

Price these at 3s. 10d. to 4s. per foot super.

25ft. run. Clerks' desks of mahogany, with slope flaps, &c., 2ft. 6in. wide, with stained pine stand, with all bolts, and footrail, locks, &c., complete.

This is rather a doubtful item to price without detail. Some of the manufacturers of desks price this item per foot run at 14s.

20ft. run. Ditto, fitted with drawers instead of flaps, with locks and brass flush handles.

Add another shilling to price.

220ft. run. 5in. by 2in. Moulded architrave and mitres (see sketch).

This may be taken at 6s. per cube foot, fixed complete, 5in. × 2in. = 10 sectional inches, say 1in. cube, and $^1/_{12}$th of 6s. = 6d. per foot run. The mitres may be priced at 15 p.c. additional.

* * *

TWO GREAT CITIES: A COMPARISON.

By Wm. Woodward.

A THIRTY years' retrospect, from an architect's point of view, of the works accomplished in the two great cities of the world, Paris and London, may not, at the present moment, be uninteresting, especially if it may lead to continued efforts to make London healthy and beautiful.

The cleanly beauty of Paris is disappearing: Napoleon the Third's imperial liberality, Haussman's skill, refined architecture, inventive sculpture, and municipal thoroughness were subjects which drew forth from every observant visitor to Paris thirty years ago unbounded admiration. But during that period, in those particular matters, Paris has not advanced one step. To say that it has remained stationary is to be gentle in expression, and, as a fact, Paris presents itself to-day as a vision of departing beauty. A variety of Governments, ephemeral with little time to devote to municipal work, have let that work take its chance, and with the customary result. Haussman, in his grand conception of what street improvements should be, has had no follower; the refined academic architecture which graced his boulevards requires the hose to atone for its want of vigour and variety in design; Carpeaux's bold originality in sculptural grouping has had no imitators, and the watering and cleansing of the Paris streets has descended to the level of London 30 years back.

A month ago I revisited Paris, and, among other disillusions, I was astonished to find the pavements of the Place de la Madeleine pretty well covered with discarded handbills of some "Piccadilly Chapeau," to observe the beautiful bronze ornament in the grand entrance of La Madeleine partially filled up with dust, the accumulation of a considerable period, and to note that the matter of street watering and general cleanliness is by no means what it might and should be. The shops, too, are not what they were; the goods are mostly shoddy productions from England, and the enjoyment of taking refreshments outside the restaurants in the boulevards is much curtailed by the unchecked importunities of beggars and by vendors of all sorts of articles, who thrust their wares in one's face.

And what of London during the like period? The Metropolitan Board of Works has given us the great main sewer and has embanked the Thames; has lost the opportunity to Haussmanise Shaftesbury-avenue, and has murdered Piccadilly-circus. To Lord Brabazon (now the Earl of Meath) belongs the credit of first taking in hand in a practical manner the preservation of open spaces in London. Every foot of open space was gradually, but surely, being covered with bricks and mortar, and he and his Metropolitan Gardens Association even stayed the hand of the devouring Metropolitan Board, who, amongst other trifles of a like nature, proposed to build houses in the centre of Piccadilly-circus and upon that little oasis in the desert at the junction of Bloomsbury-street with Oxford-street. The Earl of Meath has converted disused burial grounds and churchyards, which were the depositories of filthy refuse, into pleasant gardens and recreation grounds, embellished dreary places with trees, and provided seats for the weary all over London.

Enormous strides have been made in the architecture of London. The West-end and the City testify to beauty and originality of design, design betraying less of strict uniformity, the result, in Paris, of education in the Ecole des Beaux-Arts, but more of that originality and vigour which will not need "washing" to keep up its character. Of London's sculpture the least said the better; the Beaconsfield statue at Parliament-square gave us a taste for figure work, but little else has been done to warrant admiration.

Whitehall will be, in ten years perhaps, the noblest thoroughfare in the world, and when St. Margaret's Church has been cleared away to afford a proper view of the Abbey, and the long-promised opening from Charing Cross to the Mall accomplished, our successors will look back with pride upon a benevolent Office of Works.

The London County Council and the vestries have moved apace. Parks and other open spaces have received all the attention that could reasonably be desired; means of extra transit across the noble river have been taken in hand; and, notwithstanding the criticism of the nebulous Council of the Royal Institute of British Architects, Vauxhall Bridge will bear testimony to the ability of Spring-gardens. The Council has given us a Building Act which is not too clear and precise; it has started its tramways, and its halfpenny busses already excite the wrath of their penny brothers in the Strand. The worst of "betterment" is that Bozier's-court continues to block the end of Tottenham Court-road, the street from Holborn to the Strand is where it was a century ago, and "Booksellers-row" is still the rendezvous of lovers of light literature. The Tower Bridge is finished; but that is the work of the Corporation of the City of London.

Two such representative cities as Paris and London must necessarily contain monuments and attractions of a somewhat similar character. Let us compare a few of them. The Seine pales before the Thames. The public markets of Paris are superior to ours. Notre Dame has a far finer exterior than Westminster Abbey, but the latter is proportionately more beautiful inside. No domed edifice in Paris is equal to St. Paul's Cathedral, and this fact will be more pronounced when Sir William Richmond presents us with more of his beautiful mosaic work.

There is no parish church in London which can hold the candle to St. Sulpice or St. Eustache. Our modern churches show great beauty and power of design, whilst the two modern churches of Paris, St. Augustin and that of The Trinity, are poor, and distinctly unecclesiastical in effect. The Tower of London remains, the Bastille has gone. Our Houses of Parliament make those of Paris blush, and the Arc de Triomphe de l'Etoile looks down with lordly disdain upon our poor Hyde Park Corner and Marble Arch. The Vendôme Column rivals our Monument on Fish-street Hill, and the fountains of Paris hold their own against the squirts of Trafalgar-square. The "Bois" in no way, "in the season," equals our "Park," but our large parks, squares, and open spaces have no counterparts in Paris. We have no Opera House equal to Charles Garnier's magnificent edifice, and although as decorated structures our restaurants are superior to those of Paris, the "cooking" is inferior. We have a new "Carlton Hotel," but it has a strong rival in the beautifully-planned Elysée Hotel (the joint production, I understand, of English and French architects), which now graces the Champs-Elysées. And so one might go on.

The lesson is this: If the London County Council will keep more to real municipal work and less to matters which can well be left to other bodies; if it will house itself in a respectable manner, as Paris has done for itself, there is no reason whatever why London should not rise up as a powerful rival to, and indeed quite eclipse, Paris. Englishmen have no desire to see Paris fall, but let its municipal authorities look to it, though, or its rapid decline is certain. Paris is a beautiful city on the wane. We all have a sneaking regard for it, and for its inhabitants, and if I have ventured to point out what I conceive to be some of its blemishes, it is not that I love Paris less, but that I love London more.

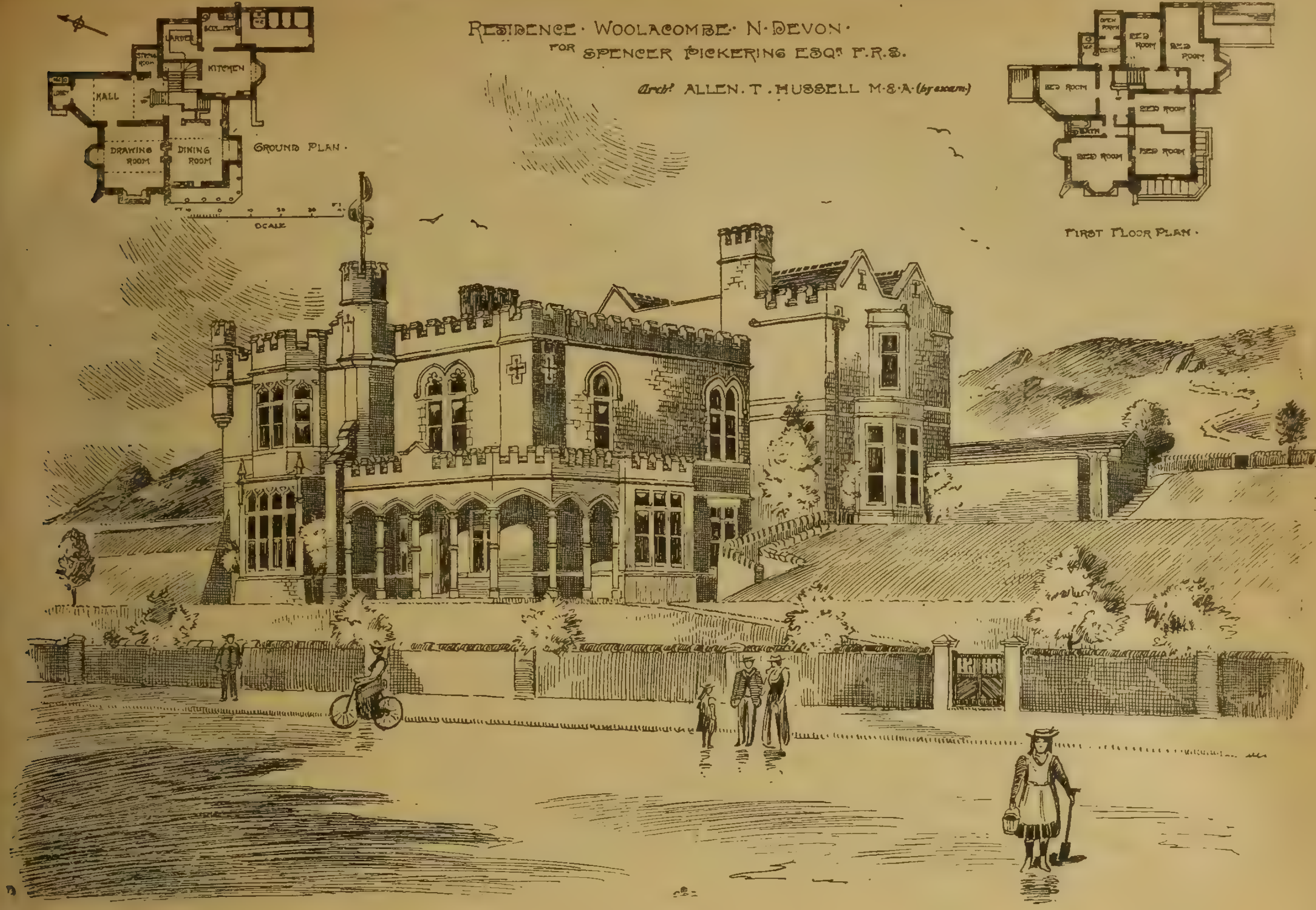
THE PAVING OF ROADS AND STREETS.

It is certainly not for want of fair trials and experiments that neither at home nor abroad has any regularly recognised *fin de siécle* method of paving the roads, streets, and thoroughfares of great cities been as yet generally arrived at. Our own Metropolis will form as good an example of our meaning, and possibly better than any other European capital. No two vestries, or other local authorities differently designated, contiguous to, or far distant from, each other can or will agree to adopt conjointly any particular description or mode of paving for the thoroughfares under their charge, although the actual conditions of traffic are practically identical in both cases. It is not a little amusing to stand at the usual zig-zag boundary-line of a couple of parishes, and observe the totally opposite character of the two systems of paving upon each side of the line of demarcation. One or other of them must, *cæteris paribus*, have a claim to preference; they cannot, as our Hibernian friend would put it, "both be best." This diversity in our methods of paving, if it be any consolation to us, is not restricted to the roads and streets of our own great cities and towns, but is more or less apparent in those of both Europe and America, although not to the same extent in the latter country. In fact, during nearly the last twenty years a uniform system of paving has been authorised and adhered to in a large number of the most important and populous cities in the United States. This praiseworthy unanimity proceeds from a cause and other favourable circumstances which do not necessarily obtain in other lands.

For road-paving purposes the Americans import from the most southern of our West Indian islands—Trinidad—a considerable annual quantity of the contents of the *Lacus asphaltites* existing there, and for which they pay about 7s. 9d. per ton. This is mixed with sand in the proportion of four parts of sand and one of asphalte, and possesses one excellent property—of not becoming slippery after wear and tear. There are two circumstances which principally conduce to the absence of the acknowledged defect in nearly all asphaltic paving, which places it *hors de combat* for all streets laid out with anything approaching a steep gradient. The first is that the proportion, four parts of sand to one of asphalte, is large, which, however, it may be remarked, might be adopted elsewhere. The second cause is no doubt the more powerful agent at work in bestowing the advantage of non-slipperiness upon the mixture, which is due to the fact that the lake asphalte of Trinidad contains not the smallest quantity of limestone or any calcareous formation, such as are found in abundance in most of the asphaltic stone brought from France, Switzerland, and numerous districts in the Jura mountains. The products extracted from the Trinidad asphalte are refined, triturated, mixed with a small allowance of petroleum oil, and then combined with the sand. Experience has proved that roads paved in this manner will withstand all descriptions of traffic for eight and even nine years before any repairs worth mentioning are needed. In the case of old thoroughfares, macadamised or paved with any hard material, which have been considerably worn down by long service, they may be left *in situ*, and will answer exceedingly well as a foundation, and will thus save the expense of the bed of concrete usually employed for that purpose. Belgian engineers have calculated that this system of road-paving could be laid down in Belgium and maintained for nine or ten years at a first cost of 15s. 2d. per square yard.

Until horses cease to form the haulage power on common roads, and vehicles, except such as those which run on rails are unprovided with indiarubber tires of some kind, so long will it be hopeless to look for one of the chief desiderata of street-paving—that is, comparative insonorousness. While the rumbling of wheels and the heavy ringing of the iron hoof continue to resound in our streets, there will be but a poor approach to a noiseless roadway. It may not be generally known that each description of paving has a note or tone peculiar to it when struck,—which may vary from a dull, half-muffled sound to a sharp, accentuated, and exceedingly unpleasant intonation. The blows, jars, and shocks which are brought incessantly upon the road-paving by the traffic call into play the elastic properties of the materials composing it, and give rise to the loud complaints they make against the treatment they receive. Viewed from this standpoint, paving setts of basalt, porphyry, or any hard stone are quite unsuitable for the main thoroughfares of large cities. Under these circumstances the attention of those interested in the subject of insonorous streets and roads was turned in the direction of wood-paving, and numerous careful and valuable experiments were undertaken to ascertain how different specimens of timber behaved when actually subjected to the conditions of ordinary heavy traffic. Blocks of beechwood did not turn out as satisfactorily as was expected, but much superior results were obtained by the use of those of either pitch-pine or fir. These, however, were inferior to the hard woods belonging to the Eucalyptus species of Australia. It is stated on good authority that all the Antipodean woods are endowed with a much higher degree of resistance to compression than any of the European timbers employed for the purposes street paving. In Sydney, blocks have been laid down in roads exposed to the heaviest traffic, and after a hard service of over ten years, the wear and tear did not penetrate below the surface to a depth of more than one-eighth of an inch. One of the varieties of the Eucalyptus family, tallow-wood, contains a very large percentage of turpentine, which enables it to resist the action of the weather, and renders it well adapted for use in damp situations. The presence of this antiseptic ingredient to a great extent palliates, although it may not altogether remove, one of the greatest objections towards the employment of wood-paving—that is, that it absorbs, and allows to penetrate, and, as it were, to filter, through the joints a very considerable part of the gross and deleterious impurities which are voided on the surface of the road. This wood, notwithstanding the price which must be paid for it, has been introduced and tried with undoubted success in the city of Leipsic.

There is another point which has not received the attention it deserves, which is intimately connected with the subject before us, and possesses a most important bearing upon the choice of one description of roadway in preference to another. It is the question of haulage, or, in other words, which is the road-paving which presents the minimum amount of resistance to the traction of vehicles, and also the accompanying least extent of wear and tear?—the last mentioned item being a consequence of the former, depending in some degree upon the nature of the traffic. We cannot do better than



quote here the well-known authority, Mr. Hering, who is reported to have stated that, taking as the unit of comparison the load that one horse will draw upon a horizontal track of iron rails, the other six forces will come in the following order :—

$1{\cdot}\dot{6}$ horses will draw it on asphalte.
$3{\cdot}\dot{3}$ horses will draw it on the best Belgian block pavement.
5 horses will draw it on the ordinary Belgian pavement.
7 horses will draw it on good cobble stones.
13 horses will draw it on bad cobble stones.
20 horses will draw it on an ordinary earth road.
40 horses will draw it on a sandy road.

Mr. Hering deduces from the observations and experiments recorded above, that a city whose roads and streets were paved with asphalte would save to itself and its citizens from 200 to 300 per cent. of the cost to it and to them of transporting passengers and goods, as compared with a city paved with setts or blocks. It is well known that the employment of asphalte in a liquid state for both road and footway purposes, has been very much superseded by the use of compressed asphalte. The reason for this substitution is stated to be that even under the most favourable circumstances, an intimate union or combination does not take place between the concrete foundation and the upper layer of asphalt. Consequently, it frequently happens that under the exigencies of constant and heavy traffic, water and a number of partly dissolved impurities find their way by infiltration, between the upper layers of asphalte and the underneath bed of concrete—a state of things which might give rise to serious anti-hygienic complications.

Equally with ourselves, many varieties of road and street paving have been tried in Germany, and may be regarded from a threefold point of view—the technical, the economical, and the salubrious. The perfection of a paving, judging from numerous examples, appears to be one which has no joints, which is laid also upon a jointless foundation, which has a fairly smooth and regular surface, is easily cleaned, and permits of a noiseless—as far as possible—circulation of the traffic. It is therefore obvious that granite, basalt, and other descriptions of hard stones are excluded from the list; but an artificial stone named Keramite has been found, after some years of trial, to have answered exceedingly well. It has a pleasing surface tint, a sufficient degree of hardness, lends itself readily to the rolling of wheels, suffers comparatively but little under wear and tear, does not yield dust of a sharp crystalline character like that of the harder rocks, and, above all, is moderate in first cost. At the same time, it is not altogether noiseless, and must yield in this respect to both wood and asphalte, which are so well known that it is needless to further describe them. It should be observed that the allegation that wood paving is insalubrious is strongly disputed. We think that in the case of the hard Australian woods there may be a good deal of truth in the counter statements, but they cannot be considered to apply to the softer kinds of timber, which were originally, and are still, used for paving purposes, and it was probably the mistake of employing wood unfit for the position in which it was placed that gave the whole family a bad name. T. C.

NEW RESIDENCE, WOOLACOMBE, NORTH DEVON.

THIS building has been erected as a summer residence for Mr. Spencer Pickering, F.R.S., of Harpenden and London. It is built with local stone, and the main quoins and general facings being of a beautiful red stone from Woolacombe Down. The other dressings are of Doulting stone, and the roofs are partly covered with Delabole slates and partly with lead. The main walls have been built 2ft. 6in. thick, to withstand the heavy gales which are frequent on this part of the coast. The drawing-room ceiling has been made in India by Cashmere natives of coloured woods forming patterns. The building contains a large hall, drawing and dining-rooms, kitchen and offices, and strong room on the ground floor, and six bedrooms, with bathroom, w.c.'s, &c., on first floor. The site is one of the finest in Woolacombe, commanding splendid views of the Bristol Channel, with Lundy Island in the distance, and of Woolacombe Bay and its noted sands, with Morte Point and the dreaded Morte stone to the N., and Baggy and Hartland Points to the west. The builder is Mr. Wm. Ellis, of Woolacombe, and the architect is Mr. Allen T. Hussell, M.S.A., of Ilfracombe.

CENTRAL SCHOOL OF ARTS AND CRAFTS.

WORK recommences on Monday next at the Central School of Arts and Crafts, 316, Regent-street, W. (opposite the Polytechnic), which is conducted by the Technical Education Board of the London County Council. The school, which is entering on its fourth session (under the general direction of Mr. George Frampton, A.R.A., and Mr. W. R. Lethaby), has already more than justified its existence, and signs are not wanting that it is beginning to exert a beneficial influence upon the trades represented there. The object of the school is to provide for craftsmen engaged in trades where artistic handicraft is required, a training both in the principles of design and in its application to their specific industries. The teaching is throughout specially directed to the requirements of the trades in which the students are engaged, and the school is, within certain limits, only open to those actually working at such trades.

At present the school provides teaching mainly for those engaged in bookbinding and silversmiths' work, and in certain branches of the building trade. Other departments, however, are being opened from time to time, as a demand arises, and it is hoped that from the nucleus which exists at the Regent-street School there may eventually grow a complete system of artistic and technical instruction, which will insure for the artisans of the Metropolis that sound and practical artistic training which, under present conditions of production, they so greatly need.

The instruction given is very complete. In addition to the large general classrooms for modelling and design, which are equipped with art examples of the best periods, separate workshops are provided, fitted with all necessary tools and appliances for "large" and "small" silver work, goldsmiths' and jewellers' work, chasing, engraving, and repoussé work. These classes are in charge of Mr. W. Augustus Steward and a staff of assistants. There is also a class in enamelling under Mr. R. Atkins. The bookbinders' classes, under Mr. Douglas Cockerell, are also an important section of the school, in which quite remarkable results have been achieved. Special classes, dealing with the building trade, are those in architecture (Mr. Halsey Ricardo), modelling and ornament as applied to architecture (Mr. Roscoe Mullins), design for furniture and metal-work (Mr. C. Spooner), stained glass (Mr. Christopher Whall), ornamental lead-work (Mr. F. W. Troup), stoneworking for architects (Mr. Hook), and lectures (free to architects and builders) on "Mechanics of Construction" (Mr. Percy Kirk). Modelling from the life is taught by Mr. Mullins; drawing from the life by Mr. Louis Davis, Mr. H. Wilson, and Miss M. Alexander; wall-paper and textile design, heraldic drawing, lettering, and decorative black and white by Mr. Catterson-Smith. Other classes are wood-carving and gilding (Messrs. Stuttig and Underwood), in which an attempt is being made to bring together once more carving and gilding in picture-frames of simple and original design; wood-cuts in colour, by a method based on Japanese practice (Mr. F. Morley Fletcher); embroidery (Miss Ellen Wright, directed by Miss May Morris).

Some adjoining premises have been secured by the Technical Education Board to meet the continual increase in the attendance at the school. Additional accommodation will thus be provided for some of the existing classes, and new classes will be started in ornamental writing, suitable for illuminated addresses, &c. (Mr. Edward Johnstone), and lithography, which will be carried on as a branch of the Board's Lithographic and Photo Process School at Bolt-court.

The fees are quite nominal, one inclusive payment of 2s. 6d. per month admitting to all classes (with the exception of the life classes). Workmen in receipt of less than 30s. a week pay 1s. a month, and apprentices, learners, and improvers are admitted free. Full particulars of any of the classes, and forms of application can be obtained from the curator at the school, 316, Regent-street, or from the secretary of the Technical Education Board, 116, St. Martin's-lane, W.C.

SANITARY PROGRESS.

CONGRESSES have commenced or concluded their labours. The Sanitary Congress, held last week at Southampton, of which we have given reports, dealt with a number of kindred subjects. Among them was the supply of pure water in our large towns, introduced by Mr. Jas. Lemon, C.E., F.R.I.B.A., a question of considerable moment just now. Even in London the subject has been lately brought home to the crowded districts during the recent drought and hot weather, and sooner or later the inadequate and not very pure river source, will have to be supplemented by going to Wales, or in obtaining a well supply. No doubt, as Mr. Lemon observed, Parliament should allocate certain areas to given districts, so as to avoid the objection of big towns seizing upon all the most desirable areas of supply, to the detriment of small towns. Our reports of the proceedings of the Congress will indicate the opinions of experts on this question.

Quite as important a problem is how best to house an overgrown population—a question that was scarcely discussed in its many bearings. Of the difficulties attending the erection of large blocks of dwellings in our chief towns the most pressing for solution is where to accommodate our working classes in our large cities at a reasonable expenditure. If the cost of acquiring the sites had to be thrown upon the buildings, there would be a difficulty in erecting decent and presentable buildings. Generally, these were depressing and ugly enough, owing to the large capital invested in purchasing the land. In the case of Southampton, the improvement scheme being carried out by the corporation will, according to Mr. Lemon, involve a cost of £11,600 per acre, including legal and surveyor's expenses—a large expenditure. The result will be that the municipal lodging-houses and workmen's dwellings would incur a loss to the corporation if the cost of the site was thrown upon them. Owing to the heavy ground-rent having to be met, the buildings themselves would suffer; as it is impossible to erect buildings of any pretensions to design that would repay the capital and interest in these circumstances. The buildings and workmen's dwellings are thus overweighted by the cost of the site, an experience which all promoters of these schemes have had to encounter. If we adopted the course of placing these dwellings in the suburbs, some consideration should be shown to residential properties, to prevent their deterioration.

No suggestion is reported as to the design for buildings of this class, though this is a point that ought to be considered. The many storied "flats" in some of our suburbs have been generally failures: their encroachment on open spaces, the obscuration of light they cause, and their heavy barrack-like appearance have not favoured them in the public estimation. The class they are intended to accommodate dislike them for their very unhomely qualities; their flights of common stairs, their lack of garden or playground. In Birmingham, Manchester, Liverpool, Glasgow, and several towns in the North, an improved plan of dwellings of two or three stories have been devised, which possess many advantages over the huge block of flats. In London the working classes have never taken kindly to the "flats" of tenements in various parts of Clerkenwell, Drury-lane, and Farringdon-road. Lord Rowton's "homes" are built on a better plan, and the common cooking and dining rooms, with dormitories or cubicles above, seem to meet the requirements of single men better. The monotonous element in our common flat system is the repetition of floors of tenements of two, three, or more rooms on each floor; individual family comfort is sacrificed in a manner distasteful to the ordinary working-class Englishman, who would sooner have his own two or three rooms distinct, and served by a separate staircase. In some parts of London, and in several other towns, the two-storied dwelling, with a separate entrance or lobby to each of the two sets of rooms, has been found to give more satisfaction to the working man; there is a distinct staircase to the upper set, thereby avoiding all conflict with the residents of the lower rooms. The elevations of these buildings differ slightly from the ordinary tenement of six or seven rooms, and when there is an open area at the rear that can be used as a drying or playing ground the essentials of a town dwelling of this class are secured. The paper on the "Development of Hospital Construction and Planning," by Mr. William Henman, F.R.I.B.A., of Birmingham, resulting from the use of plenum ventilation, was a subject that opened a well-worn question. Much can be advanced on both sides of this subject. The advocates of this system of ventilation claim for it that the air can be cleansed, tempered, and brought to a suitable hygrometric condition without any inconvenient apparatus; draughts are avoided, and window opening could be dispensed with. Mr. Henman also said that further developments of the system were being tried, which would provide for a supply of cleansed air equal to a change of air ten times per hour night and day throughout the building. He was speaking of hospitals or schools. These are advantages if they can be obtained without drawbacks. The plenum system, by forcing in cleansed and tempered air under any conditions of external temperature, may be applied in many conditions; but it is essentially an artificial method of ventilation. The fresh air is forced into the room above the breathing level and is drawn out near the floor, and this downward movement is contrary to the natural law that warm-respired air ascends. As a consequence, the heated and vitiated air of the room is by this plan rebreathed over again. Mr. Henman may have overcome this difficulty. The "natural system," by utilising the upward tendency of the warmed and respired air, provides for all emergencies, and the simplicity of the plan is in its favour. How the natural system can be applied to hospitals and asylums has been shown by Mr. Robert Boyle in his articles and illustrations of last week, p. 291, where he shows a hospital fitted up with this system. Each floor is provided at the ceiling level with foul-air exits in the centre connected with upcast flues by shafts between the joists of the concrete floor in special channels. These upcast shafts act in connection with air-inlet brackets on the walls fitted with air-warmers, and ventilating radiators are placed on every floor. The remarks of Dr. Thomas Glover, on the contrary, on the ventilation of hospitals and crowded buildings by a new method of distribution and removal of air, urged mechanical ventilation in the case of crowded rooms, and the impotence of natural ventilation in mill cases. Dr. Glover would use both the plenum and the vacuum system, the blowing-in air at inlets, and exhausting it from outlets, a place that would dispense with the necessity of air-tight rooms. A great deal has been argued for and against each system of ventilation; but we believe that most architects prefer a simple and natural mode of ventilation to any complex and mechanical system. The remarks on sanatoria for consumptives were interesting. The idea of supplying a large hall with warmed and filtered air, free from fog, in which patients may sit, will commend itself to many; but the open-air treatment has still many advocates.

BREAKING STRENGTHS OF CONCRETE SLABS AND EXPANDED METAL.

A JOINT meeting of representatives of the Northern Architectural Association, the Newcastle, Gateshead, and Tyne District Master Builders' Association, and the Council of the Building Trades' Exchange, was appointed in March last to organise and carry out an independent test of the comparative breaking strengths of concrete slabs made with and without the addition of "expanded metal." The details were left in the hands of a sub-committee, under whose personal direction and supervision twelve slabs—of which particulars are annexed—were set up on wood centrings and brick piers in the foundry yard of the Gallowgate Iron Works, belonging to Henry Walker and Son, Ltd., on July 20 and 24 last, the centrings being removed on August 16. It is intended to submit the slabs to breaking-load tests on Tuesday, the 19th inst., between the hours of 10 a.m. and 1 p.m., and 2.30 and 5 p m. Architects, contractors, and other gentlemen interested are invited to be present.

PARTICULARS OF SLABS.

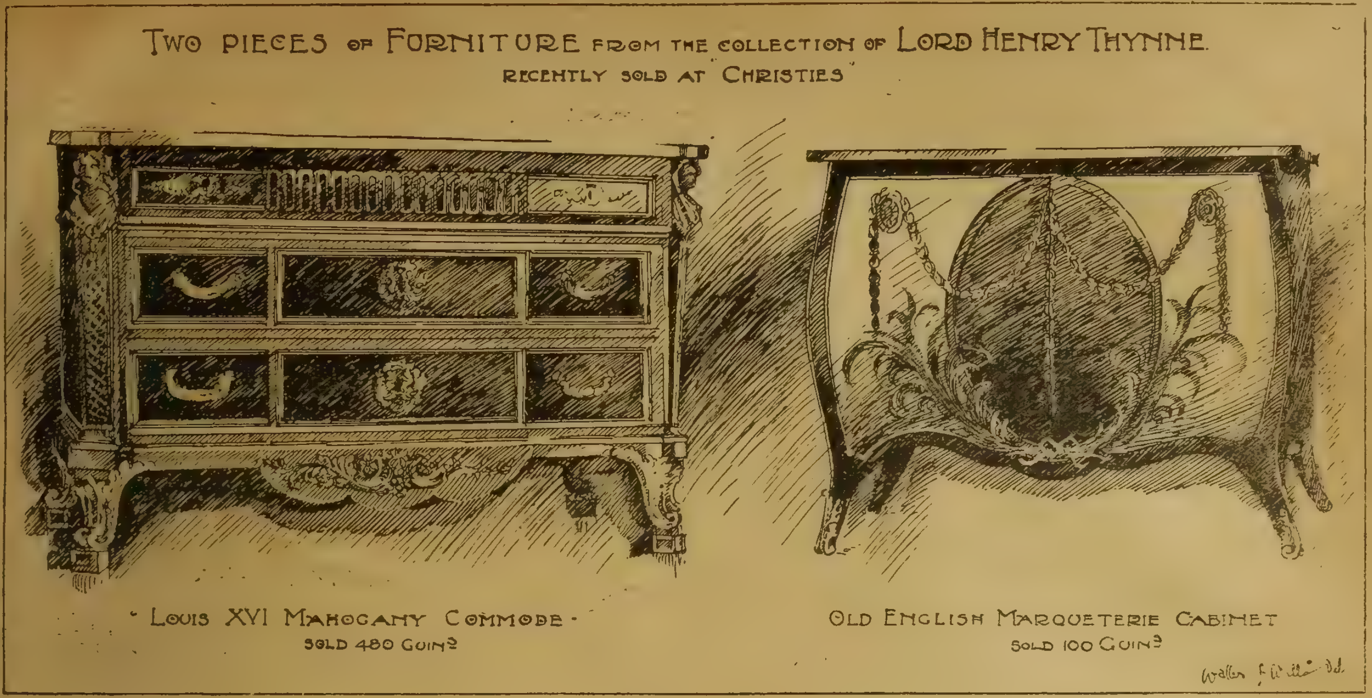
Size.	8ft. by 4ft.	6ft. 6in. by 4ft.	5ft. by 4ft.
8in. thick, concrete only (gauged 5–1)……………	No. 1 …	No. 3 …	No. 4
5in. thick, concrete (gauged 5–1) and No. 10 expanded metal ……	No. 2 …	No. 5 …	No. 8
4½in. thick, concrete only (gauged 3–1)……………	No. 6 …	No. 7 …	No. 12
3in. thick, concrete (gauged 3–1) and No. 8 expanded metal…………	No. 10 …	No. 11 …	No. 9

N.B.—The slabs are in three rows, and are arranged as follows:—

1	2	3	4
5	6	7	8
9	10	11	12

AUSTRALIAN TIMBER EXPORTS.

ALTHOUGH Australia possesses several of the largest-known areas of forest country, abounding with timbers of a most useful character, principally hard woods, and therefore suitable for many purposes for which the soft woods of northern Europe and America are unfitted, the export trade in the same remains in an undeveloped condition, save in Western Australia, where considerable quantities of jarrah and other hardwoods are annually shipped to South Africa, Europe, and elsewhere. In New South Wales, notwithstanding the great natural resources of the colony, the value of the timber imported is greatly in excess of that exported. According to Mr. Coghlan, the New South Wales Government Statistician, the bulk of the timber which comes into the colony consists of pines and other soft woods, the native pine being in some respects inferior to Oregon and Kauri; but there are other softwoods equal to any of the timbers imported. The imports during 1898 consisted of dressed timber valued at £65,567, rough timber estimated at £328,753, and sundries—such as doors, sashes, shooks and staves, laths, shingles, and palings—worth £35,741. The bulk of the dressed timber in 1897 came from Norway, which supplied no less than 5,092,640super.ft. of a total of 8,723,450super.ft. imported. The United States came second with 1,495,318ft.; while 556,035ft. were imported from Victoria, 504,008ft. from South Australia, 397,295ft. from Germany, 239,064ft. from New Zealand, 228,123ft. from the United Kingdom, and 161,919ft. from Canada; while of the rough logs, 25,513,065ft. came from the United States, 18,054,941ft. from South Australia, 16,602,583ft. from New Zealand, and 2,273,556ft. from Canada. The bulk of the United States exports were from Port Eureka, California; and the Canadian, from Puget Sound. The foregoing figures a somewhat large



TWO PIECES OF FURNITURE FROM THE COLLECTION OF LORD HENRY THYNNE.
RECENTLY SOLD AT CHRISTIES

LOUIS XVI MAHOGANY COMMODE
SOLD 480 GUINS

OLD ENGLISH MARQUETERIE CABINET
SOLD 100 GUINS

importation from the neighbouring colonies, but a considerable portion of the timber is not of native growth, but imported from other countries. Victoria supplies the Riverina district, and South Australia, Broken Hill, where there is a large demand for timber for mining purposes. At the Chicago Exhibition the New South Wales Railway Commissioners showed six sleepers, three of which had been taken out of one of the metropolitan lines, after being in the road for 24 years, and three out of the western line, near the Lithgow Zig-zag, which had been in the road for 23 years; and these sleepers were but little the worse for wear. The New South Wales Forest Department also exhibited railway sleepers, made of ironbark and red gum, which had stood the test of 17 to 25 years' constant use. A portion of the New South Wales court was laid with wooden blocks of blue gum, blackbutt, tallow-wood, forest mahogany, and boxwood, showing the suitability of these hardwoods for paving purposes. The utility of many woods for such purposes has been proved in Sydney, the blocks, after subjection to heavy and continuous traffic for nearly ten years, having exhibited but slight wear. Professor Warren, of Sydney University, in his work on "Australian Timbers," states that he is continually being shown specimens of timber, taken from bridges or piles in damp ground, which have been in use for 40 to 60 years or more, and show no signs of decay whatever. Australian hardwood trees are remarkable for the great size of the beams which may be obtained from them, as well as for the extreme strength and durability of their wood, the grey ironbark having a resistance to breaking equal to 17,900lb. per square inch, as compared with a mean of 11,800lb. for English oak, and 15,500lb. for teak. None of the other timbers of the colony have so high a resistance to breaking as this description of ironbark; but nearly all the varieties have a greater strength than oak. The absence of branches for the greater portion of the height enables the timber to be obtained to the best advantage; and as full-grown trees of most varieties are rarely less than 100ft. high, with corresponding girth, the quantity of timber obtainable is very large. It will readily be seen, therefore, that the timbers of the colony are in every way suitable for building construction, wood-blocking jetties, railway carriages, and other work in which great strength and durability is required. It has been officially estimated that the area of ironbark lands belonging to the Crown in New South Wales is 16,870,000 acres, on which there is sufficient timber ready for cutting to yield 167½ million sleepers, and that if private lands are also taken into account the number of ironbark sleepers alone which the colony can produce may be set down at 500 millions, sufficient for no less than a quarter of a million miles of railway track. Under proper forestry regulations and conservation, the production of grey ironbark could be continued on a most extensive scale for many years to come.

FURNITURE SKETCHES.

THESE two pieces of furniture come from the collection of the Right Hon. Lord Henry Thynne, recently sold at Messrs. Christie's. At a previous date (July 21st) we also gave some sketches from this fine collection. The Louis XVI. mahogany Commode contains five drawers, massively mounted with finely-chased ormolu, with draped terminal female busts at the angles, frieze, escutcheons with arabesques and amorini, acanthus foliage handles and feet, and surmounted by a dove-coloured marble slab 59in. wide, stamped "Riesener, T. C., 1769," and with Royal monogram and crown in a circle. It was sold for 480 guineas. The Old English Marqueterie Cabinet is of satin, hare, and other woods, with shaped front and sides and folding doors, inlaid with husk festoons, medallion ornaments and foliage, the top inlaid with a group of flowers in oval medallion on trellis-pattern ground, 44in. wide. Sold for 100 guineas.

BOOKS RECEIVED.

The London Manual, 1899-1900, edited by ROBERT DONALD (Edward Lloyd, Ltd., Salisbury-square, E.C.)—The new issue of this useful handbook of reference is an improvement on its predecessor. The Manual is an invaluable guide to the various public bodies of the Metropolis. The changes made by the new London Government Act of this Session have been incorporated, and the full text of the Act is given, with clauses of other Acts referred to. The constitution and population of the new boroughs are given, and the Manual will be found a valuable help to those who wish to make themselves acquainted with the governing bodies of the Metropolis, which now number nearly 500. There are, more precisely, nine central authorities, besides 471 local bodies. The vestries and district boards, their officers and list of members are given. Hitherto each parish was subject to its own administration under various local acts, and there has been no unity. The history of the London Government system is briefly sketched, and the new London boroughs, 28 in number, are each described, and their areas, population, and rateable value given. The London County Council, the list of members of the various bodies, the various schemes undertaken, the City Corporation, the Metropolitan Asylums Board, water and gas companies, Thames Conservancy, London Tramways, and various other authorities are noticed. The photo. illustrations are numerous, and the manual ought to be in every office and countinghouse in London, and no householder or ratepayer should be without a copy.——*Murray's Handbook to Wilts and Dorset* (London: JOHN MURRAY, Albemarle-street).—A fifth edition of this volume in these reliable and well-written guides has just been issued, and has evidently been carefully revised and brought up to date, especially in the sections dealing with Stonehenge, Salisbury, and Sherborne and Lacock Abbeys, while more space is given to the growing watering-places of Weymouth and Swanage and their vicinities. The work is reset in larger type, the paragraphs being more distinctly divided, and a freer use made of sanserif and italicised type. Considerable space is devoted to a detailed description of Stonehenge, of which three ground plans are given, and the editor of the book, "B. C. A. W.," after citing the various conjectures as to the design, date, and purpose of the stone circles, closes by pronouncing it more recent than Avebury, and agrees with Lubbock in assigning both to "a pre-Roman period of uncertain date"—a vague but obviously safe conclusion. Mr. Thomas Hardy has contributed a number of names of places alluded to in the Wessex Novels, and some descriptive extracts from those works add to the interest of the handbook.

CHIPS.

The opening of a new organ at St. Columba Church, Burlingthorpe-lane, Leeds, was celebrated on Friday night. Messrs. Abbott and Smith, of Leeds, are the builders.

The directors of the Great Western Railway Company have decided to spend £10,000 on the improvement of the railway station at Sheffield. A booking and parcels office is to be erected on the street level at the passenger station, and a subway will be constructed. Both platforms are to be extended, and the buildings to be erected on the up platform include a booking and parcels office and station-master's office. A new goods station, with shedding, &c., will also be provided, and facilities afforded for the loading of timber.

The Scarborough Harbour Commissioners have decided to proceed with the enlargement of the West Pier, which is too small for the amount of trade carried on at the harbour. The pier will be widened 70ft., and a timber jetty across the end, extending to 170ft. in length and 70ft. in width, will be erected. The cost is estimated at £10,000, towards which the Scarborough Corporation have agreed to contribute £1,500.

The Dean and Chapter of Bangor have presented to the parish church of Nevin, South Carnarvonshire, which has been recently restored, the carved-oak pulpit which was used at the opening services of the cathedral. A history is attached to the pulpit. Dr. Alexander, the then Bishop of Derry, was to preach at the morning service at Bangor; but his frame was so bulky that he was unable to get into the permanent structure, and at the last moment one of a more commodious character had to be hastily constructed.

THE "A.A." BROWN BOOK.

THE issue of the welcome "Brown Book" of the Architectural Association reminds us all of the recommencement of the session on Oct. 6, when the President, Mr. G. H. Fellowes Prynne, F.R.I.B.A., will address the members and distribute the prizes.

In their Report the Committee announce a further continued increase in the membership, the total number at the close of the last session being 1,270. Eighty-nine gentlemen were elected, nine more re-joined, there were 46 resignations, deaths, &c., so that the net increase is 52.

The educational work shows a great improvement on previous sessions; but there is certainly room for more. The Association has the advantage of some very able lecturers, and it speaks badly for the zeal of the younger members that the classes are not better attended. In some instances, as in connection with Mr. Farrow's lectures on Elementary Construction, English Architecture, &c.; on the Greek and Roman Orders, by Mr. Elsley Smith; on Plane and Solid Geometry, by Professor Hulme, and others, the attendances have been fair; but that only sixteen students should take advantage of a course on Professional Practice like that of Mr. Collard, or eight that on Quantity Surveying by Mr. Leaning, or that the Land-surveying and Levelling course should not have been held at all because there were so few entries, is not creditable to the readiness of members to avail themselves of the facilities afforded them of continuing and completing their professional education.

The finances of the Association are satisfactory. The annual income was £1,809 5s. 5d. during the past year, and the balance in hand is £1,117 10s. 1d. The following is the approaching session's

LIST OF MEETINGS.

Oct. 6, 1899.—Annual General Meeting. The President's Address and Distribution of Prizes. G. H. Fellowes Prynne, F.R.I B.A.
Oct. 27.—"The Construction of Circular Stairs and Vaults." Lawrence Harvey.
Nov. 10.—"Marble." W. Brindley.
Nov. 24.—"Art as Applied to the Weaving and Printing of Textile Fabrics." Sir Thos. Wardle, K.B.
Dec. 15.—"Colour Decoration in Relief." Gerald Moira.
Jan. 12, 1900.—"The Dome as the Basis of an Architectural System." Illustrated by measured drawings of Italian churches. Arthur Bolton, A.R.I.B.A.
Jan. 26.—"Cast Iron." W. R. Lethaby.
Feb. 9.—"Working-Class Dwellings in Blocks." Thos. Blashill, F.R.I.B.A.
Feb. 23.—"The Exterior Treatment of Sharp or Acute Angles in Street Buildings." Illustrated by lantern views. A. W. Hennings, A.R.I.B.A.
March 9.—"Small Houses." C. E. Bateman, F.R.I.B.A.
March 23.—"The Decoration of Churches." H. C. Corlette, A.R.I.B.A.
April 6.—Subject to be announced. Basil Champneys.
April 27.—"The Paris Exhibition." E. H. Bennett.
May 11.—"Egyptian Temples." Alexander Payne, F.R.I.B.A.

Note.—The Ordinary Meetings will be held on the Fridays stated above, in the rooms of the Royal Institute of British Architects, 9, Conduit-street, W., at 7.30 p.m.

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The council of the "Homes of St. Barnabas Incorporated" for poor, aged, and disabled clergymen accepted on Wednesday a tender for £8,546 for the erection of the first block of new buildings on a site recently purchased at Lingfield, Surrey.

New infants' schools erected in Brasshouse-lane, Smethwick, by the Tipton School Board, were opened last week. They have been erected from plans by Mr. F. J. Gill, architect to the board, and accommodate 600 children.

A movement is on foot for the construction of a new East and West Coast Railway, connecting the Durham coke ovens with the West Cumberland furnaces. At present the West Coast producers of hematite pig-iron are handicapped to the extent of 4s. 6d. per ton by railway rates on coke from the Durham ovens to the blast-furnaces. It is suggested that a new line from Workington to the Durham coalfield would not, perhaps, exceed 65 miles in length, and should be built for an average cost of £10,000 per mile. With a capital of £650,000 the line ought to pay, seeing that over a million tons of coke might be carried over it per annum.

An extension of 7½ acres to the Alexandra Dock of the Hull and Barnsley Railway Co. has recently been opened. The Alexandra Dock has an area of 46 acres, with two miles of quays. The new dock, which is the shape of an equilateral triangle, has half a mile of quays. This new dock is intended principally for coaling purposes, and will double the present coaling capacity. The walls of the dock, which are 36ft. 6in. high, are constructed of concrete, the upper part being lined with blue Staffordshire bricks. The docks have been carried out under contract by Messrs. Whittaker Bros., from the plans prepared by, and under the direction of, Mr. Pawley, the company's engineer.

OBITUARY.

Mr. Charles Henry Marriott, J.P., architect and surveyor, of Manor Lawn, Dewsbury, died last week, having just completed his 72nd year. He was the son of the late Jeremiah Marriott, architect and surveyor, and an alderman of the first town council of Dewsbury, who in 1847 became Lord of the Manor of the borough, a position in which he was succeeded by his son, and who in turn is followed by his only son, Mr. Arthur Sutcliffe Marriott, also an architect and surveyor. The late Mr. C. H. Marriott was primarily a land valuer, and he was well known throughout the country in connection with the valuation of estates. In local disputes his unrivalled topographical knowledge made his advice exceptionally valuable, especially in the assessment of land for acquisition by railway companies. He served for nine years on the borough school board, being elected as chairman during his last three years of office. He was an ardent antiquarian, and a member of the Yorkshire Archæological Society.

Mr. William Jurd, architect and surveyor, died at his house, 5, Cranbury-place, Southampton, on the 4th inst., at the age of 69 years. Mr. Jurd had been connected with the laying out of many estates for building purposes, notably of late, in conjunction with Mr. I. Sanders, that between Hill-lane and Shirley-road, which, less than five years since, was green fields, but is now rapidly being covered with bricks and mortar. In the riverside suburb of Woolston he owned Jurd's Wharf and other waterside and more inland property, and from the intimate knowlege he had of old Southampton and its surroundings his information and advice were highly esteemed. He was a member of the last School Board for Southampton, and had held many public offices in the town and at Woolston.

CHIPS.

At the Wesleyan Chapel, Fowey, an organ built by Messrs. Heard and Sons, of Truro, was opened last week.

The scheme for the creation of the Mont des Arts at Brussels, which has engaged King Leopold's attention for many years, is now likely to be accomplished. The site of the new building in the Montague de la Cour is at present occupied by 300 houses, the removal of which will cost nearly half a million sterling; and in their place is to be erected a terrace in order to give security to the artistic collections of the Belgian capital.

The power-loom was first successfully introduced in Dunfermline in 1849 by Messrs. Andrew Reid and Co. The firm are signalising the 50th anniversary of the innovation by making important additions to their premises, including a warehouse and counting-house, three stories in height, with Mansard roofs at the extremities of the long block. The architect is Mr. T. Hyslop Ure, of Dunfermline.

The monument to the Duc d'Aumale, which is to be erected in the courtyard of the Château of Chantilly, will be inaugurated next month, in the presence of the members of the Institute. It is an equestrian figure in bronze, by Gérôme. The monument is 25ft. 6in. in height. Two bas-reliefs, ornamenting the stone pedestal, represent the surrender of La Smala to the 17th Light Infantry, which the Duke commanded, and the submission of Abdel Kader.

Rapid progress is being made with the new church and schools which are being erected in Wellington-street, Higher Broughton, Manchester, for the Methodist New Connection congregation that worshipped in Salem Chapel, Strangeways, now used as a Jewish synagogue. The schools will be ready for opening in February, while the church, of which the memorial-stones were laid on Saturday, is to be opened some six months later. The total estimated cost is £6,000.

A new board school, with accommodation for 266 scholars, was recently opened at Greetland by the chairman of the Elland-cum-Greetland U.D. School Board. The school has been erected from plans prepared by Mr. W. E. Williams, architect, Halifax.

The River Wear Commissioners have resolved to invite tenders for the enlargement of the docks. Now that the new pier works are approaching completion, forming a harbour of refuge at the mouth of the Wear, the extension of the docks is to be taken in hand. About 8½ acres are to be added to Hudson Dock North, and coal shipping places erected. A new timber-storage ground is also to be provided, and increased facilities afforded on the river front, where many old houses are being demolished. The outlay altogether will amount to £200,000 or £300,000.

Building Intelligence.

Brechin Cathedral Restoration.—A meeting of heritors was held on Tuesday, and the movement for the restoration of Brechin Cathedral was advanced a step. A deputation was received from the Brechin Cathedral Restoration Committee in support of an application for leave to proceed with and carry out the proposed restoration of the fabric of the parish church, according to the plans of Mr. John Honeyman, R.S.A., of Glasgow. Mr. John Shiell presided. The Right Hon. J. A. Campbell, M.P., spoke for the deputation, and after detailing the preliminary steps that had been taken in connection with the matter, said that it would be remembered that the estimated cost of the plan prepared by Mr. Honeyman, was £10,000. Since that time detailed estimates had been got from tradesmen, and their estimates amounted to £9,500. The committee had now in hand £6,700, and they were confident that they would be able to complete the work by the aid of subscriptions they were yet to receive, but which had not yet been formally intimated. Mr. Campbell having stated that a guarantee would be given by the committee to the heritors that the church would be handed over in a condition as good as it was at present, it was agreed that the committee be allowed to proceed with the work, subject to above guarantee, provided that the consent of the Earl of Southesk and two other absent heritors was obtained. A committee was also appointed to watch over the interests of the heritors while the work was proceeding.

Coventry.—The new police offices were formally opened yesterday (Thursday). The façade to St. Mary's-street is in red stone, in harmony with St. Mary's Hall and the other ancient buildings in the vicinity; but otherwise the erection is of red brick with stone dressings, and slated roof. Throughout the apartments the furniture and fittings are of oak, and the whole building is lighted with electricity and heated with hot water. Along the whole length of each floor, parallel with the frontage line, runs a corridor, from which access can be gained to any of the rooms or cells. The south end of the building is entirely set apart for the police, and to the left of their entrance-hall is the charge office. There are also situated here the chief superintendent's and sergeant's rooms, the chief's public office, and a well-equipped kitchen. To the rear, extending to the Bayley-lane frontage, is a parade-room, with concrete floor. There are seven male cells, each provided with electric light guarded by a grating, and also with plank-bed and lavatory accommodation—hot and cold water. The four cells for females are quite cut off from the others, as is also the reception cell. On the first floor are separate offices for the chief constable, chief clerk, and detective inspector, and constables' lavatory and clothes-store, the two single constables' bed and bath rooms, and the married constable's quarters. There is also a library. The court-room and offices are apart from the police offices. The old court-room has been reconstructed and renovated. The whole of the furniture and fittings of the court, including the wall panelling and doorways, are of oak. To the rear of the court is a waiting-room for witnesses. Underneath the buildings there is very extensive cellarage, which can be utilised for stores of all kinds, with also an electric light sub-station. Mr. H. Quicke is the architect, and Mr. C. Gray Hill, also of Coventry, the contractor. The outlay has been about £15,000.

Leeds.—Dr. S. W. Wheaton, an inspector under the Local Government Board, conducted a public inquiry on Friday at the Leeds Town Hall into the application of the city council for sanction to a loan of £21,250 for the purchase of the Killingbeck Hall Estate as a site for a small-pox hospital. The plans for the hospital show that provision is to be made for 104 beds. In addition to the main structure, there are to be isolation pavilions, and it is intended to erect all the infectious buildings at a distance of a quarter of a mile from the Tadcaster main road. Local bricks, with local stone dressings, will be the chief materials employed, and it is proposed to erect all the buildings on rafts of Portland cement concrete, instead of constructing the walls simply on concrete in trenches. The architect, Mr. E. T. Hall, F.R.I.B.A., of London, has adopted this principle, having regard to the fact that the hill is of clay, and therefore liable to movement under varying atmospheric influences, and also to the fact that coal-mines underlie the estate. The floors generally will be of steel and concrete. The total outlay is roughly estimated at £61,781.

Nine Elms.—Mr. John Burns, M.P., on Saturday afternoon, laid the foundation-stone of the new public baths and washhouses, to be erected by the Vestry of St. Mary's, Battersea, at the junction of Battersea Park-road and Gringle-street, Nine Elms. The new building will serve the south-west corner of the parish, and the site is in close proximity to gasworks, engineering establishments, and large manufactories. The land was purchased from the Southwark and Vauxhall Water Company, and the cost of the building has been put down at about £25,000. Mr. F. J. Smith, of Westminster, is the architect, and his plans provide for a swimming-bath, having a water area of 150ft. by 50ft., and to be utilised as a public hall during the winter months, and a number of slipper-baths for men and women. Provision has also been made on the site for washhouses, with accommodation for sixty washers. The new baths will be erected by direct labour.

Nottingham.—Good progress is being made with the erection of the new workhouse for Nottingham at Bagthorpe, which was begun in April last. The receiving wards, married couples' apartments, labour master's house, children's infirmary, workshops, and stables are now roofed in, and the three large infirmary blocks are so far advanced that the tiles are now in hand. Out of a total of about 17,000,000 bricks which will be required, 2¼ millions have been used. There are over 250 workmen employed on the works. The buildings will stand in their own grounds, over 60 acres in extent. The total cost will be £220,000. In addition to the two main blocks, the workhouse proper and the infirmary, there are many subsidiary blocks, such as isolation hospital, vagrants' ward, receiving wards, children's infirmary, &c. The block for imbeciles, which will accommodate upwards of 200 persons, has a frontage exceeding 450ft. It possesses a dining-hall 60ft. by 33ft., accommodating 154 persons in addition to the officers. Each of the four infirmary blocks now in course of erection exceeds one hundred yards in length. Two of these are for males and two for females. Between these there will be an administrative block, 215ft. by 190ft. The children's infirmary occupies a south-west frontage. Separate accommodation is being provided for the nursing staff. The workhouse infirmary at the south end of the site is the largest block, and covers an area of 240ft. by 140ft. On the east of this building, accommodation is provided for aged, infirm, and able-bodied women, while quarters have been provided for twelve married couples. The five blocks on the west will accommodate 400 aged, infirm, and other male inmates. At the back of the administrative blocks are workshops and labour master's house, which are nearing completion. The main block will include a dining-hall and concert. The tailors, carpenters, bootmakers, and smiths will all have separate establishments. The chapel will accommodate 500 persons. The receiving wards and casual wards, which face each other on either side of the main entrance, form two distinct buildings. The height of the rooms throughout varies from 11ft. to 13ft. In all, there will be nearly 50 blocks, all of which will be connected by telephone. All the bricks used are of local production, while Matlock stone in heads and sills is employed. Red Staffordshire tiles are being used for the roofing of the entire building, which will contain upwards of 4,000 windows. The wood used in the interior is pitch-pine, and the flooring of all the sick wards will consist of maple blocks fixed upon beds of concrete. The floors will be fireproof in construction, and most of the roofs of the apartments in the administrative blocks, the kitchens, stores, &c., will be of iron and top lighted. The workhouse has been designed to accommodate 1,650 inmates. Mr. Arthur Marshall, of Nottingham, is the architect, Mr. F. Evans, of Mill-street, Basford, the contractor, and Mr. W. H. Foxworthy the clerk of the works.

Westwood, Selston.—A new district church for the hamlet of Westwood, about two miles from Selston, was consecrated by the suffragan Bishop of Derby on Saturday. The church is cruciform in plan. The nave measures 61ft. by 31ft., in addition to south porch, and the chancel 31ft. by 16ft. 6in., besides the transepts, one of which will form the organ-chamber and vestry. A low square embattled tower and spire will eventually be added at the west end, but for the present a small temporary turret to carry the bell has been erected over the chancel arch. The bell weighs 1cwt. 27lb. Accommodation is provided for 356 worshippers. The style of building is Gothic of the Perpendicular period, somewhat freely treated. The walls are of local bricks, faced with Leicestershire sand-stocks, with dressings of Matlock stone, and the roofs are covered with brown Staffordshire tiles. The internal fittings are of red deal, stained to a deep green shade, with the exception of the lectern, which is of pitch-pine. The font is of red and white Hognaston stone, made by Mr. R. G. Lomas, of Derby. The building is warmed by hot water on the low-pressure system. Mr. P. H. Cary, of Derby, was the architect, and Mr. Wm. Salt, of Ripley, the builder.

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CHIPS.

Yesterday (Thursday), at the Town Hall, West Ham, a Local Government Board inspector held an inquiry in reference to applications made by the West Ham Town Council to borrow a sum of £85,130, the chief items of expenditure being wood-paving, £63,500; fire brigade expenses, £17,400; and convenience at Maryland Point, £2,650.

The Birmingham, Tame and Rea Drainage Board, which deals with the sewage of Birmingham and six adjoining urban districts, has found it necessary, owing to the growth of population, to nearly double the extent of its sewage farm. An additional 1,200 acres of land has been purchased, and the work of laying it out is being carried out by some 300 men in the employ of various contractors, at a cost of £100,000, in addition to the sum paid for the land.

Mr. James Heron, B.A., B.E., A.M.I.C.E., has been appointed county surveyor of Co. Down, Ireland, at a salary of £800 per annum. There were eleven applications for the post from acting county surveyors, and seventeen from other candidates. Mr. Heron is a son of Prof. Heron, of the Assembly's College, Belfast, and has been county surveyor of Monaghan since 1891.

At a special meeting of the Uttoxeter Urban District Council held on Monday it was unanimously decided to adopt the recommendation of the sanitary committee to provide a scheme of sewerage for the town. The scheme is one of two formulated by Mr. Willcox, of Birmingham, and the estimated cost is from £7,000 to £8,000.

A fortnight since we gave some particulars about the scheme of Mr. W. P. Hartley, who has built a street of cottages at Aintree, the tenants of which will ultimately be their own landlords. The tenants were asked to consider whether they would remain under their agreements with Mr. Hartley, or seek the benefit of Mr. Chamberlain's Act. They have just decided to adhere to the proprietary agreements already entered into with Mr. Hartley.

A window designed by Mr. D. E. Evans, of Dover, and executed by Mr. T. W. Camm, of Smethwick, has recently been erected in the parish church of Goodnestone, Kent. The subject is St. Gregory admiring British Slave Youths in the Forum at Rome. It occupies the entire three lights of the east-end window of the south aisle. The window was unveiled by the Lord Bishop of Dover, and was admired for the rich and harmonious colouring and excellence of execution. The window is a memorial to the late Miss Emma Lawrence.

A Local Government Board inquiry was held in Cheltenham on Tuesday by Col. A. J. Hepper, D.S.O., R.E., with respect to the application of the town council for sanction to borrow £16,600 for the purposes of further extension of electric lighting.

A massive churchyard cross, standing 15ft. high, has been erected in the new portion of the churchyard at Farnham Royal and dedicated by Bishop Mylne. The cross is formed of blocks of Silician marble, each weighing several tons. The work has been designed and executed in the studios of Mr. E. J. Physick.

At the Central Criminal Court on Wednesday William Henry Duncan, 70, engineer, pleaded guilty to an indictment which charged him with offering a sum of money to Edgar J. Harper, an official of the County Council, as an inducement to for him to do something in respect of a matter affecting the Council. Duncan was engaged on behalf of the owner of land at Tooting in the sale of it to the Council. The Council offered £1,200 an acre, but Duncan asked for £1,400, and it was alleged that he endeavoured to induce the Council's official, who was conducting the negotiations, to accept half of the commission he was to receive, if he would recommend the purchase of the land at the higher figure. Sentence was deferred until the next Sessions.

COMPETITIONS.

Fulham.—Twenty-nine designs have been sent in for the public baths at Fulham, and the baths committee are asking the President of the R.I.B.A. to appoint an assessor at a fee of one hundred guineas to adjudicate upon the plans. The assessor, when appointed, is to specially consider the possibility of securing remunerative shops, with a good scheme of baths and washhouses. He is to prepare an approximate estimate of the cost of the three selected designs.

Leeds.—The President of the R.I.B.A. has, it seems, acted as assessor in the Leeds Market Competition in awarding the premiums of £150, £100, and £50 respectively to the chosen designs. Mr. Emerson's choice has been confirmed by the Leeds Corporation; but it has not been finally determined whether the first premiated plans will be executed or not. The authors are Messrs. Leeming and Leeming, of Victoria-street, Westminster. The second place was awarded to Mr. Walter Hanstock, of Leeds and Batley; and the third prize has been given to Mr. G. F. Bowman, Leeds. Neither of these architects appear to be members of the Institute. The estimates of the three designs vary as follows: Messrs. Leeming's £73,000, Mr. Hanstock's £55,000, and Mr. Bowman's £43,000. The site for the hall is given as 4,560sq.yds.

Plumstead.—Thirty-nine designs have been received for the municipal buildings and free library scheme at Plumstead, in which competition Mr. E. W. Mountford is the assessor. It is a complicated undertaking on a somewhat unusual site, by no means easy to determine. The questions and answers issued for competitors made this fact very evident. Many weeks will probably elapse before anything is determined.

Ramsgate.—The award of the premiums has been made in the competition for the new concert-hall on the Paragon Gardens to be built by the Ramsgate Corporation on the West Cliffe. The council has confirmed the recommendations of the committee with the following result:—"Atlantic," Messrs. Arthur Ardron, F.R.I.B.A., and Bruce Dawson, of Westminster, first. "Invicta," Messrs. T. A. Pole and Little, Gray's Inn, second. "White Cross," Mr. Ernest E. Ellis, Exmouth, third. The cost of the proposed building is stated at about £15,000.

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Mr. Thomas Lawrie, architect, late of Gunnersbury, W., and Vancouver, B.C., died suddenly on Tuesday last at 85, Rothschild-road, Chiswick, aged 55 years.

The second-class swimming-bath at Morley was opened to the public on Monday. The bath is 75ft. by 30ft., with a capacity of 70,000 gallons of water. There are 43 dressing-rooms, for which it forms a roof. The first-class bath has been open a month, its size is 66ft. long and 25ft. wide, with a holding capacity of 46,000 gallons. There are 40 dressing-rooms.

Another section of the G.W. Railway in Cornwall has been doubled, that between Hayle and St. Erth Stations, and this was opened for double line traffic on Sunday by the up-mail passing on the new part. There has been a considerable amount of work done between the stations. The bridge over the river was a difficult piece of engineering, as no foundation could be discovered for a depth of nearly 30ft. When the doubling was decided upon it was determined to raise the line about 4ft. to bring it more to a level between the stations, necessitating the bridges being built up. The work has been carried out under the supervision of Mr. T. E. Gibbons, the district engineer.

Mr. Thomas Brightman, formerly borough surveyor and harbour-master of Queenborough, Kent, died at his residence in that town on Wednesday week, aged 82 years. He had held the combined offices for the long period of 37 years, and since age and infirmity compelled him to retire had received an annuity from the town council.

Steady progress is being made with the electric railway from Lauterbrunnen to the summit of the Jungfrau, and out of a total projected length of 7¾ miles, rising to an altitude of almost exactly 14,000ft. above sea-level, the first section, that to the Rothstock, nearly 1¾ miles in length, and attaining an altitude of 8,350ft., is open for tourist traffic. The line was designed by the late M. Guyer Zeller, who died in April last; the present engineer is M. Gobat. The gauge is one mètre, and the gradients are as steep as 25 per cent.

The Board of Trade have recently confirmed an order authorising the construction of a light railway in the county of Hampshire, between Cosham, Purbrook, Waterlooville, and Horndean.

PROFESSIONAL AND TRADE SOCIETIES.

DEVON AND EXETER ARCHITECTS' SOCIETY.—The members of the above society had an interesting excursion to Dunster and Cleve Abbey on Saturday last. Dunster Church, with its beautiful oak carved screen work, was first visited, and then, by special permission kindly given by Mr. Luttrell, the party was conducted over the Castle, its old masonry, ancient charters with the seals attached, carved oak, the bed which was slept on by Charles II. with the secret hiding-place in the wall, the room occupied by the Prince of Wales when a guest, old paintings, and the rare painting on leather, ponderous matchlocks, and relics of sieges being inspected with much interest. The members were then entertained at luncheon by the ex-president, Mr. J. Crocker, at the Luttrell Arms, after which they were driven over to Cleve Abbey, one of the best-preserved monastic remains in the West of England, possessing unusual attractions for artist and archæologist.

THE SOCIETY OF ARCHITECTS.—An extraordinary general meeting of the society will be held at the Society's Rooms, St. James's Hall, Piccadilly, W., on Thursday, September 28th, 1899, at 8 p.m., for the purpose of raising the subscriptions of all members and associates of the society, after the 31st of October, 1899, from one guinea to two guineas per annum, and for amending the article dealing with subscriptions in arrear, and the following resolutions will be put to the meeting:—"That Article No. 42 of the Articles of Association of the Society be amended by deleting the words 'One Guinea,' and substituting for the same the words 'Two Guineas.'" "That Article No. 44 of the Articles of Association be amended by deleting the words 'One Year,' and substituting for the same 'Six Calendar Months,' and that these Articles as so amended come into operation on the 1st November, 1899."

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St. George's Church, Birmingham, will be reopened next Sunday, after reseating, including the replacement of box pews and plain forms by modern benches, the removal of the side galleries, the introduction of a new hot-water system of heating, and renovation. The alterations have cost about £1,300.

A Local Government Board inquiry was held on Friday at the Batley Town Hall, before Colonel W. Langton Coke, concerning an application of the corporation for sanction to apply the sum of £1,848, being part of a loan raised, with the sanction of the Local Government Board, in defraying the cost of works of sewerage and sewage disposal, which were not included in the estimate on which such loan was sanctioned.

Having abandoned their intention to enlarge their present town-hall by taking in part of the market ground, the Blackburn Corporation have ordered the preparation of plans and estimates for the erection, near the fine new Technical School, of a great block of buildings, comprising large assembly-hall, police-court, police-station, and central fire-station. This plan involves the widening of the ancient highway of Northgate to 60ft., and the sweeping away of several streets of poor property in the centre of the town.

Hydraulic pressure will be used for working the two lifts now being erected at the Royal Courts of Justice. The entrance to one will be from Bell-yard, while the other will be approached from the upper terrace facing the gardens on the west front near Carey-street. The work is being proceeded with rapidly, and the lifts are expected to be ready for use at the reopening of the Courts in October next.

Memorial-stones were laid last week of a new Primitive Methodist Chapel in Bowes-road, Harrogate. The buildings will include, in addition to the church, a schoolroom, lecture-hall, vestries, and caretaker's house. The church will provide accommodation for 550. The cost is estimated at £8,250.

Mr. Herbert H. Law, M Inst.C E., the Local Government Board inspector appointed to hear the application of the Winchester Town Council to borrow £7,000 for the establishment of public baths, attended at the Guildhall on Friday. Mr. W. Bailey, town clerk, having stated the facts, the plans of the proposed baths were explained by the architects (Messrs. Sandsdell and Harrison, of London) in detail to the inspector.

At a special meeting of the Electric Lighting Committee of the Middlesbrough Corporation, Mr. Hammond, consulting engineer, reported that up to date there had been laid 2,515 yards of cable, leaving 58,095 yards to be laid. The price of the cable had been fixed at 17s. 11d. per yard, including pilot wires.

WATER SUPPLY AND SANITARY MATTERS.

EDINBURGH.—A special meeting of the Edinburgh and District Water Trust was held on Friday to consider the position of the Talla reservoir contract, as affected by the bankruptcy of the contractors, James Young and Sons. Lord Provost Mitchell Thomson presided. On a report from the engineer, the works committee recommended the trustees to terminate the present contract from and after the expiry of seven days' notice. Further, the committee requested the trustees to remit to them, with full powers, to make all necessary arrangements for having the work under this contract completed without delay, and to report what they recommend for the approval of the trustees. The recommendations were unanimously approved. The works committee were instructed to make arrangements for having the work under contract No. 3 completed without delay.——A meeting of the works committee was held immediately afterwards, when it was proposed that the Trust should carry on the works themselves, but this did not meet with support. It was stated that Mr. Best, contractor, who came next to the Youngs when the original contract was let, would be prepared to take up the work at the Talla on his old schedule, subject to certain modifications rendered necessary by the rise in the price of material between then and now. A remit was accordingly made to the engineer to see Mr. Best on the subject, and to report to an early meeting. Should no arrangement be come to between the Trust and Mr. Best, the alternative would be either to advertise anew for contractors or to finish the work themselves.

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CHIPS.

The town council of Bury, Lancashire, have agreed to purchase a site for an infectious diseases hospital of Earl Derby for £2,550. In the proposed building provision will be made for 50 beds. The borough engineer will prepare the conditions for competitive drawings for the hospitals, and premiums of £100, £50, and £25 will be offered to architects sending in designs.

The Newcastle-on-Tyne City Council discussed the recommendation of a special committee for the building of a new high-level bridge over the Tyne by the corporations of Gateshead and Newcastle, at a total estimated cost of £560,000, this and the subsequent balance of maintenance cost to be borne by the two municipalities in the proportion of their ratable values. The matter has been under consideration for two years, and the Newcastle City Council now adopted it by 26 votes to 20.

The town counil of Longton, Staffs, have appointed Mr. W. Morse as art master at the Sutherland Institute, and Mr. George George, of Glasgow, as head science teacher at the same institute.

At Southwold a pier and hotel are about to be built for the East Coast Development Co. The pier, of which Mr. Jaffrey, of Westminster, is the engineer, will be 700ft. in length, and will be constructed by Messrs. A. Fasey and Son, of London, the contract price being £7,000. A subsequent contract will be let for erecting a pavilion on the pier-head. The hotel will be known as the Grand, and will be built from designs by Mr. C. H. M. Mileham, exhibited at the Academy this summer, and who is also the architect under the same company for a floral hall, winter garden, and refreshment rooms about to be built at Walton on the Naze.

Earl Rosebery visited Bishop Auckland on Friday to formally open the cottage hospital for miners built near the workhouse at a cost of £2,000. The building is Domestic English in style, and contains ten beds, besides accommodation for nurses and medical staff.

The Corporation of Rochdale have decided to borrow from the Local Government Board £16,000 for sewerage works, and £7,400 for the purpose of street widening and the improvement of Newbold recreation-ground; and also £30,000 from the Public Works Loan Commissioners for the purpose of electric lighting in the borough.

A portrait of Lord Cranworth, better known by his former name, Robert Thornhalgh Gurdon, the chairman of the Norfolk County Council, was formally unveiled last week in the Grand Jury Room of the Shirehall at Norwich. The artist is Mr. J. J. Shannon, A.R.A., and the work was hung at the Royal Academy Exhibition this summer.

Messrs. Chubb's new works at Wolverhampton are so far completed that arrangements are being made for the removal of the workmen. They will be opened by the Earl of Dartmouth on Oct. 12, and Sir Henry Fowler, M.P., and the Mayor of Wolverhampton will be present.

Mr. Colin Hunter, A.R.A., an old personal friend of the late William Black, has volunteered to design the Beacon Light to be set up to the memory of the novelist at the opening of the Sound of Mull.

A new theatre is about to be built in Norwich, from designs by Mr. Ernest A. Runtz, of Walbrook, E.C. The contract has been taken by Mr. G. E Hawes, of the Steam Joinery Works, Duke's Palace, Norwich.

The Hampshire Field Club and Archæological Society held a meeting at Basingstoke, Hackwood Park, and the neighbourhood on Tuesday.

The engineer who has charge of the survey for the proposed ship canal from the Great Lakes to the Atlantic Ocean has completed his preliminary work. The project is to cut a canal 30ft. deep and 340ft. wide from Lake Erie to Lake Ontario round Niagara Falls; then, leaving Lake Ontario at Oswego, the canal will take the course of the Oswego River to Oneida Lake, and then through the Mohawk River to the Hudson River. The locks will be 1,000ft. long, with walls 50ft. high. The most important problem connected with this project is to find storage for water to feed the great canal and not injure the water supply of manufacturing concerns.

Messrs. Harrison and Hattrell, Hertford-street, Coventry, are architects to a syndicate who are developing a large estate off the Stoney Stanton-road, in that city, where there has for the past few years been an insufficiency of house room. The land is about seven acres in area, and lies between Bretts' Works and Cambridge-street. It will take about 155 houses; at present about 20 are in course of erection, and 55 others will be commenced in two or three weeks. It is proposed to make three streets through the property.

The town council of Inverness have appointed Mr. Craven, of Edinburgh, as engineer to prepare a scheme of electric lighting for the burgh.

The old observatory in Allegheny City, having become of little value owing to the increasing smoke from houses and mills built near it, a new site has been obtained in the centre of the park 552ft. above the Ohio River, and 1,200ft. above sea-level. The building will be provided with a 60ft. dome, a 30ft. and a 26ft. dome. The architectural design of Mr. T. E. Billquit has been accepted. It is Classic in style, and will be visible over an area of 50 square miles. The principal instruments will be a 30in. telescope, a 30in. reflecting telescope for spectroscopic work, and 13in. refractor for use as a free public observatory.

Only 36ft. of foundation blocks were fixed at the north end of the Scarborough marine drive during August, and 50ft. at the south end. The resident engineer has reported that on August 1 2,023ft. of foundation blocks had been fixed out of a total length of 4,270ft. The gross value of the work executed since the commencement by the contractors, Messrs. B. Cooke and Sons, of Battersea, is £29,951 14s.

The appointment of Signor Giacomo Boni to the General Directorship of archæological excavations in Italy, will meet with general approval from archæologists. The choice of Signor Boni, who has during the past year conducted the excavations in the Forum with singular ability and success, is certainly the best the Government could possibly have made.

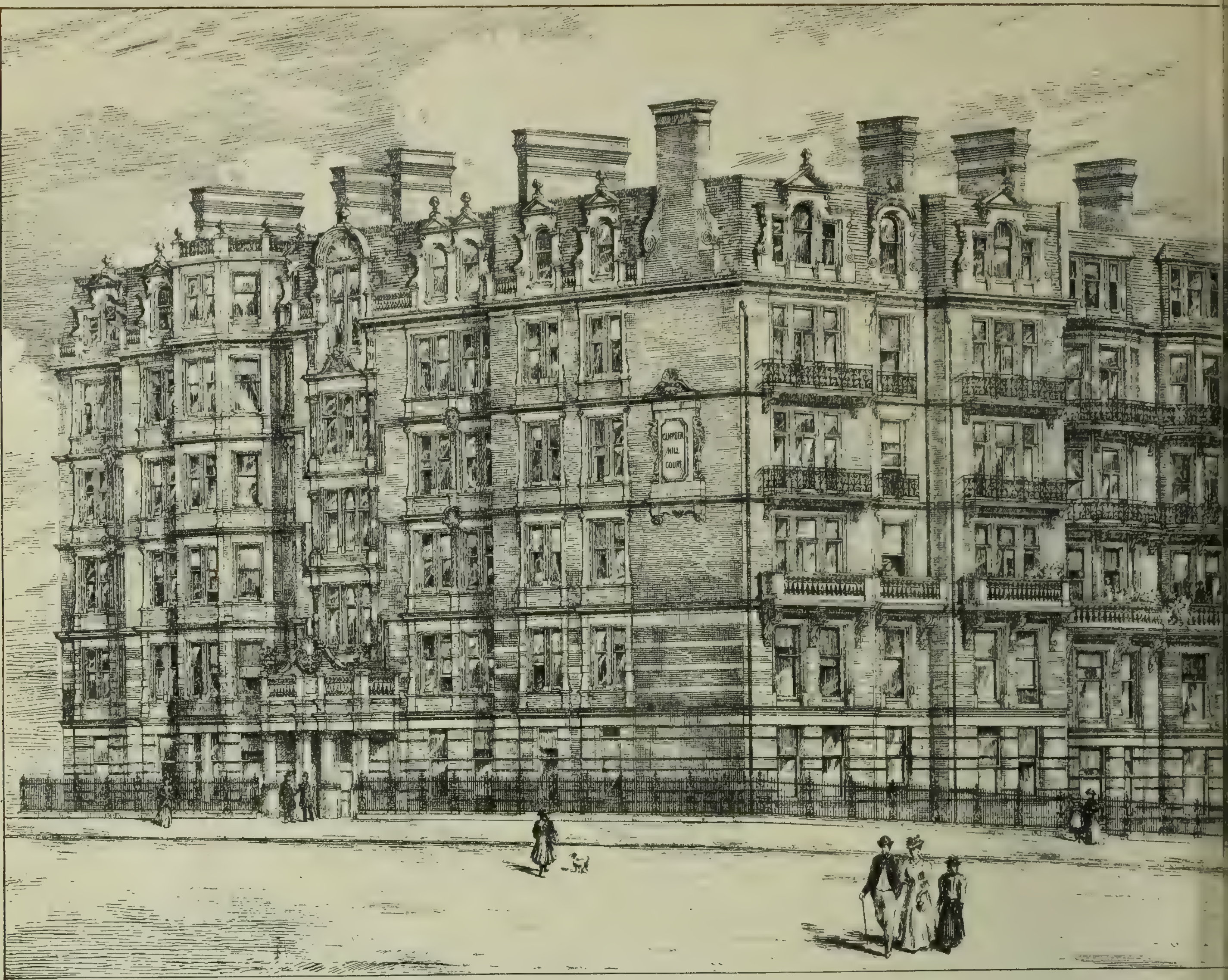
The formal opening of the Beaney Institute and Royal Museum at Canterbury took place on Monday. The Institute has been erected through the munificence of the late Dr. James George Beaney, of Melbourne, Australia, a native of Canterbury, who, by his will, bequeathed the sum of £10,000 to the Mayor and Corporation for the purpose of providing an Institute and Free Library for the working classes.

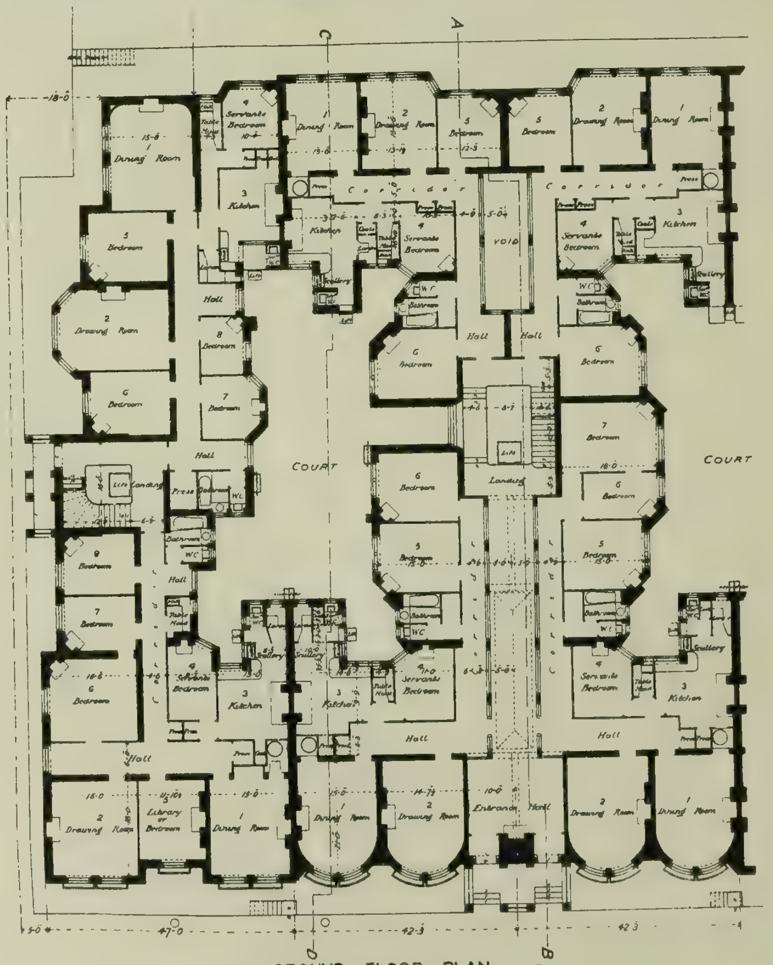
The Batley Town Council have instructed their town clerk to apply to the Local Government Board for sanction to the borrowing of £31,500 for a town-hall, and £4,500 for market improvements, in accordance with plans submitted by the architect and borough engineer.

The city council of Winchester accepted at their last meeting the resignation of Mr. W. Gamon, the city surveyor, of the office of captain of the Volunteer Fire Brigade, which post he has held since its establishment in 1881, and agreed to increase Mr. Gamon's salary from £250 to £275 a year.

A fire occurred in the stacks of timber at Yorkhill, Glasgow Harbour, on Sunday. The flames spread rapidly to numerous piles of wood, and before they were extinguished damage was done to the extent of £10,000. The timber belonged to various merchants, viz.:—Messrs. Allison, Cousland, and Co.; Singleton, Dunn, and Co.; Cant and Kemp; Wright, Graham, and Co.; M'Dowall and Nelson; John Scott, William Shanks and Son, Airdrie; Buchanan and Trench; Fraser, Taylor, and Gibson; L. A. Lightbody and Co.; James Herbertson, and Son, Edmonston and Mitchell.

The town clerk of Keighley has been instructed to initiate the necessary formalities for the adoption of the Free Libraries Acts, as a preliminary to taking advantage of Mr. Carnegie's handsome donation of £10,000 for a free library.





GROUND FLOOR PLAN

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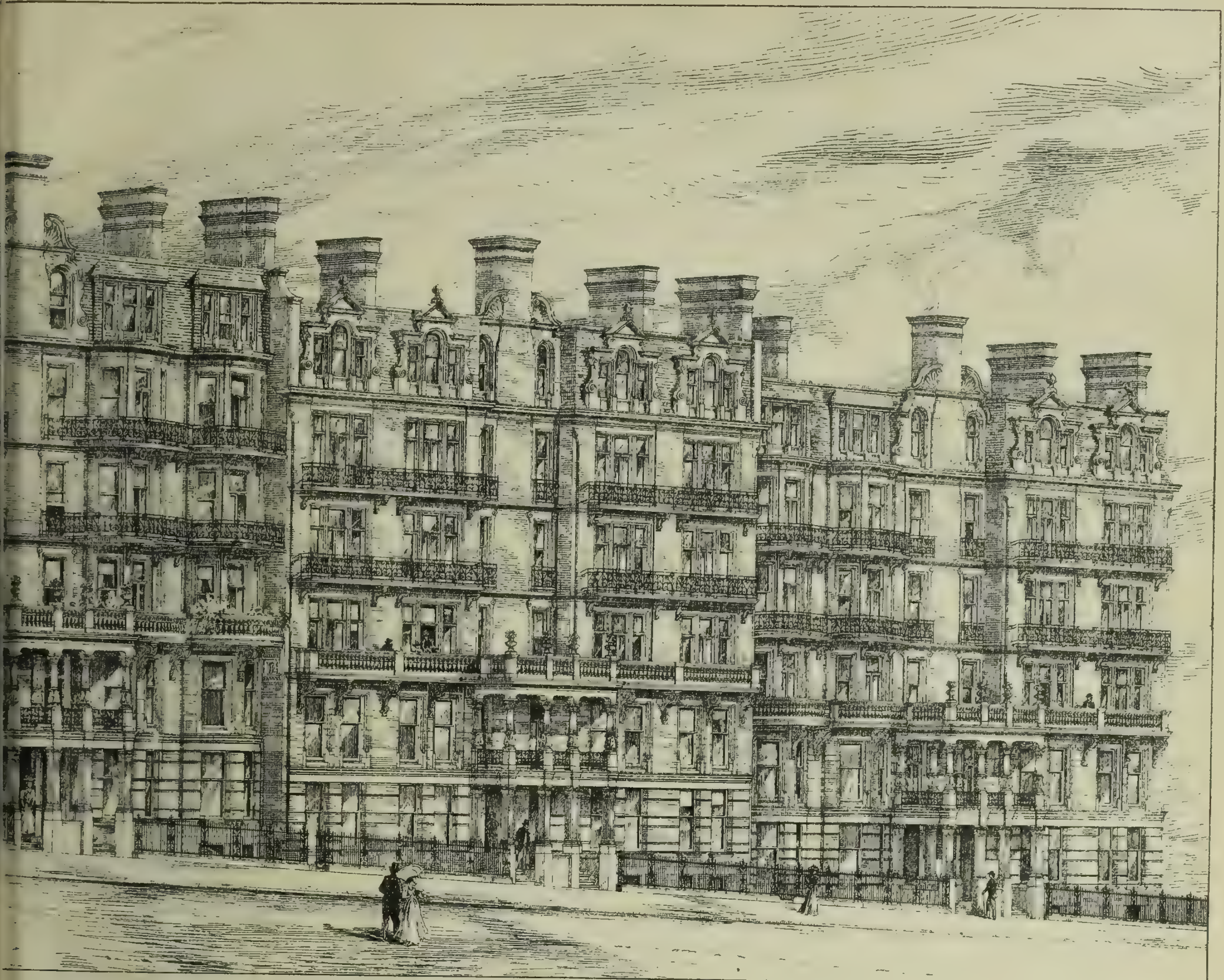

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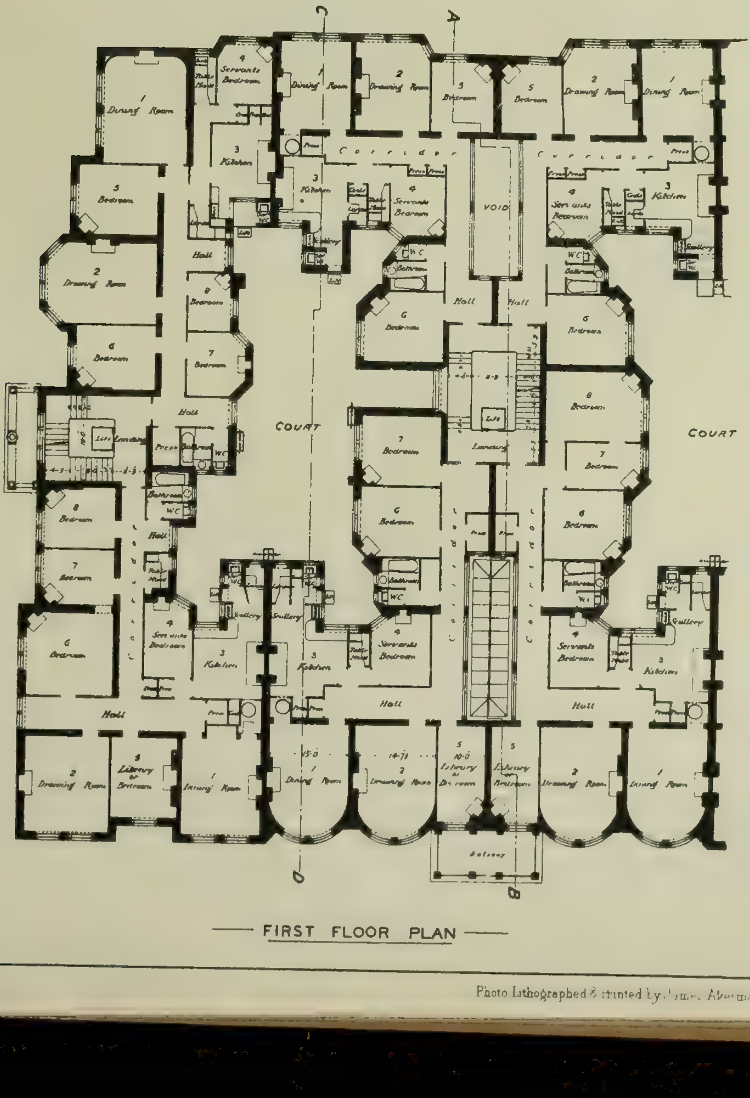
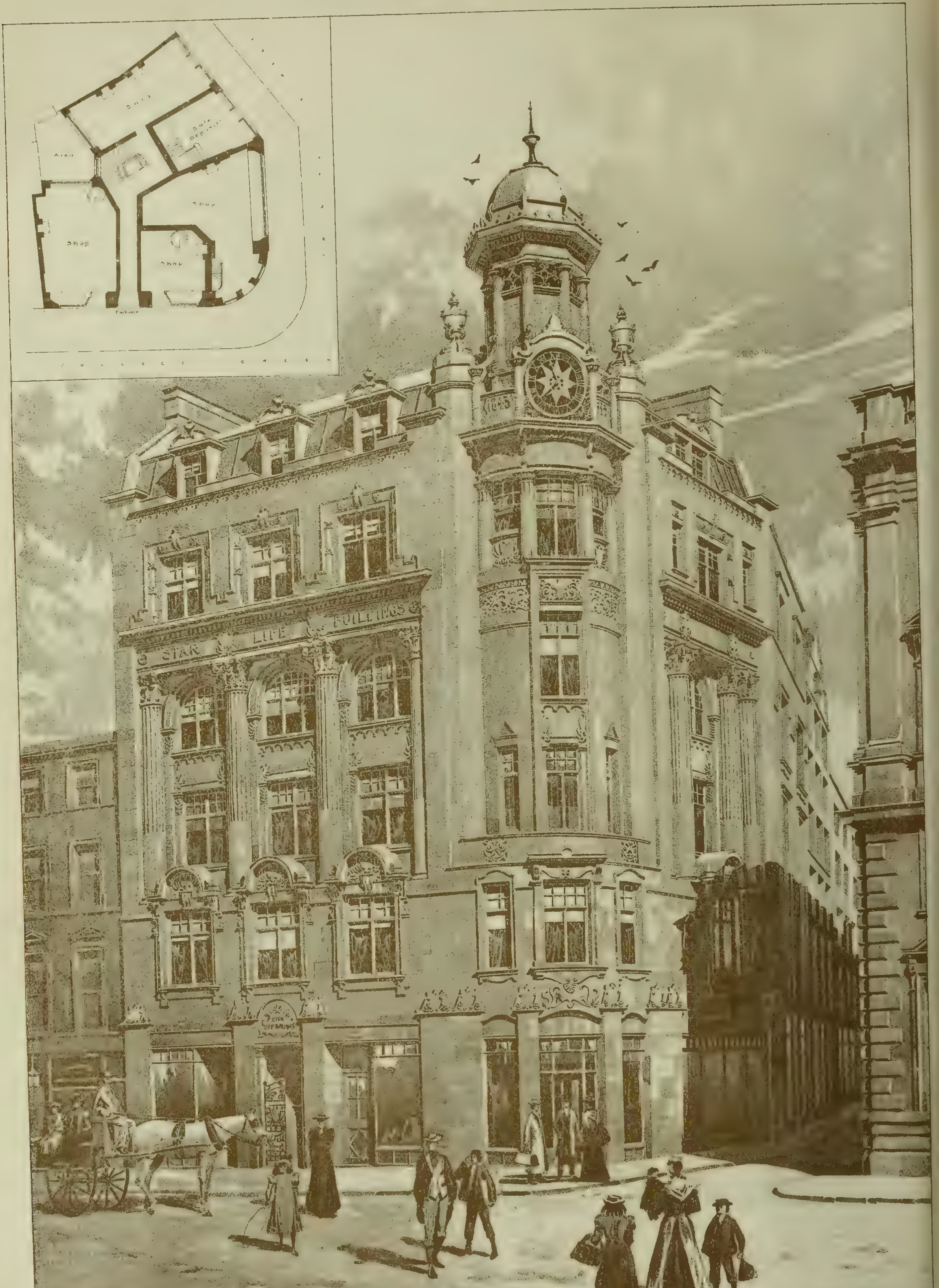


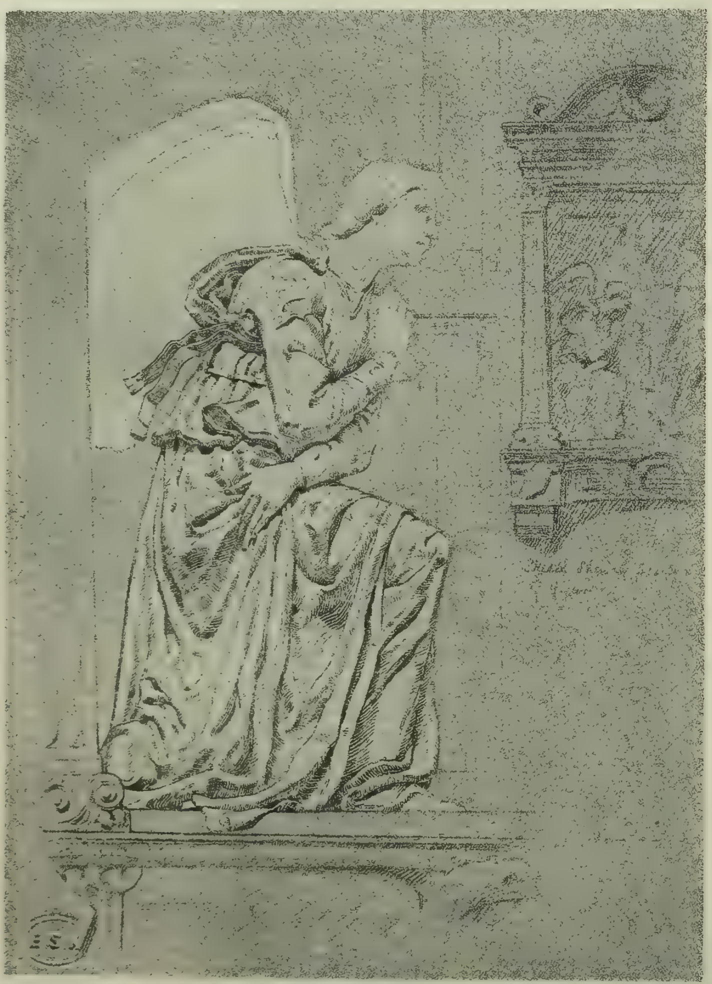
FIRST FLOOR PLAN

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.

STAR LIFE ASSURANCE OFFICES DUBLIN A·BLOMFIELD JACKSON·ARCHT



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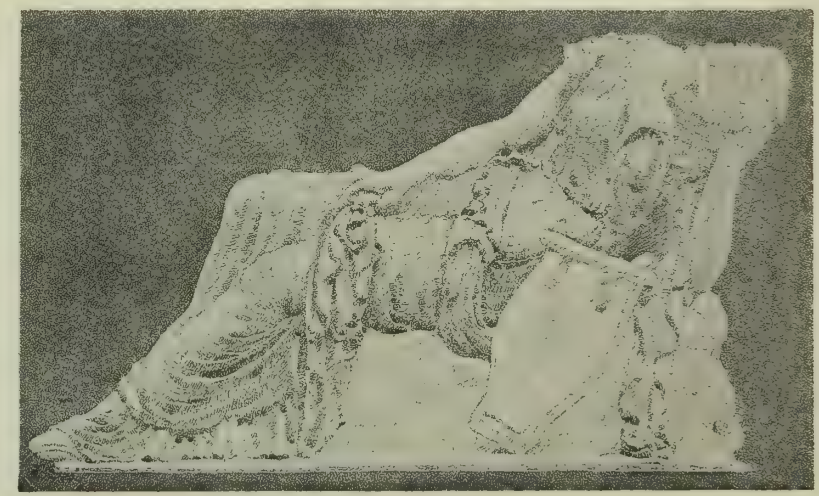

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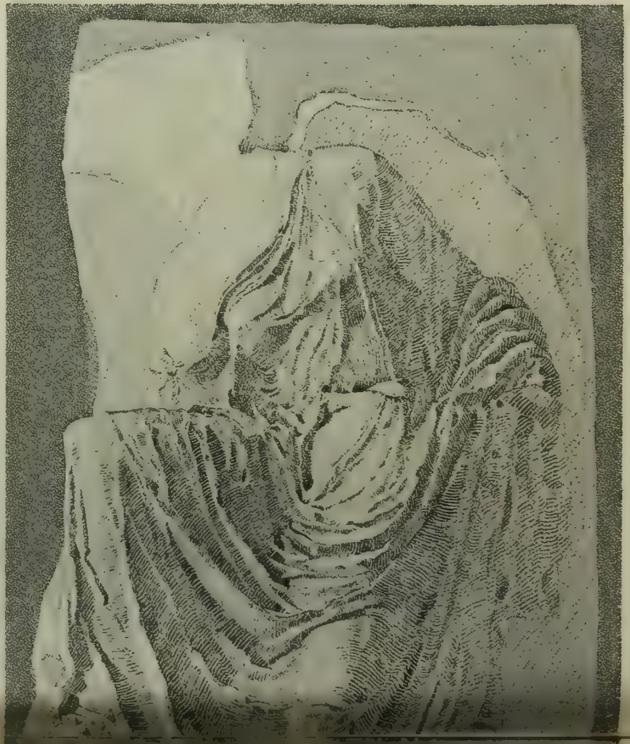

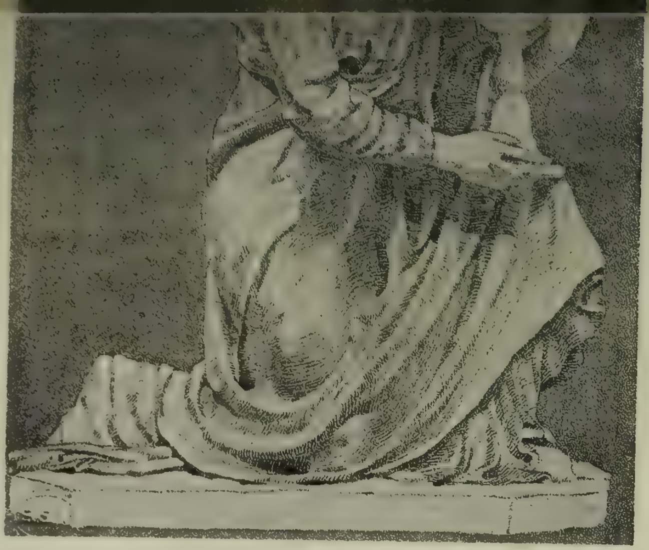

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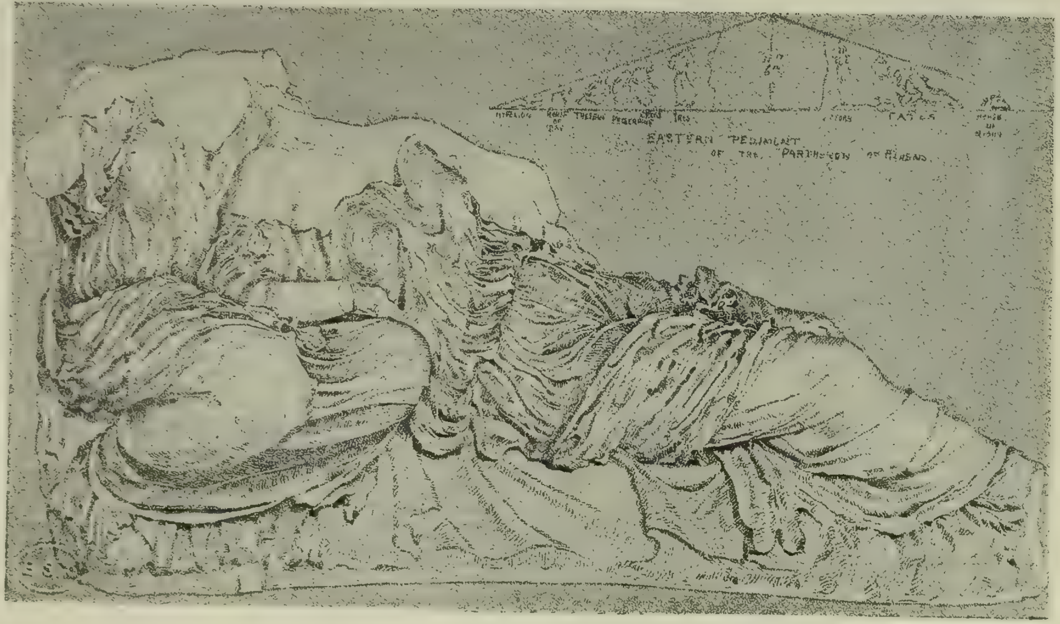

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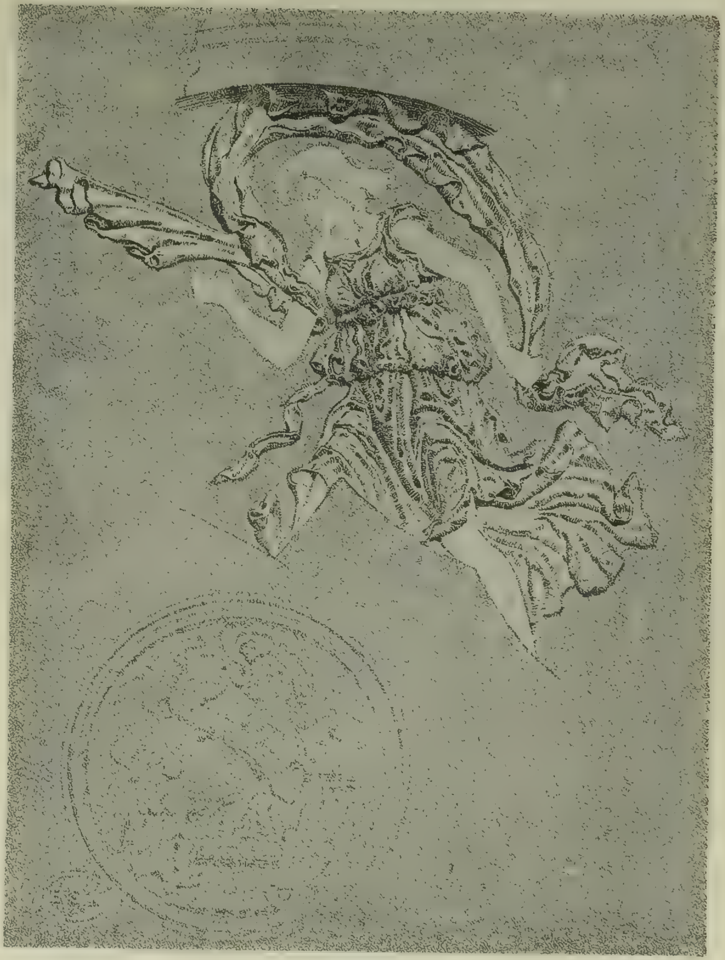
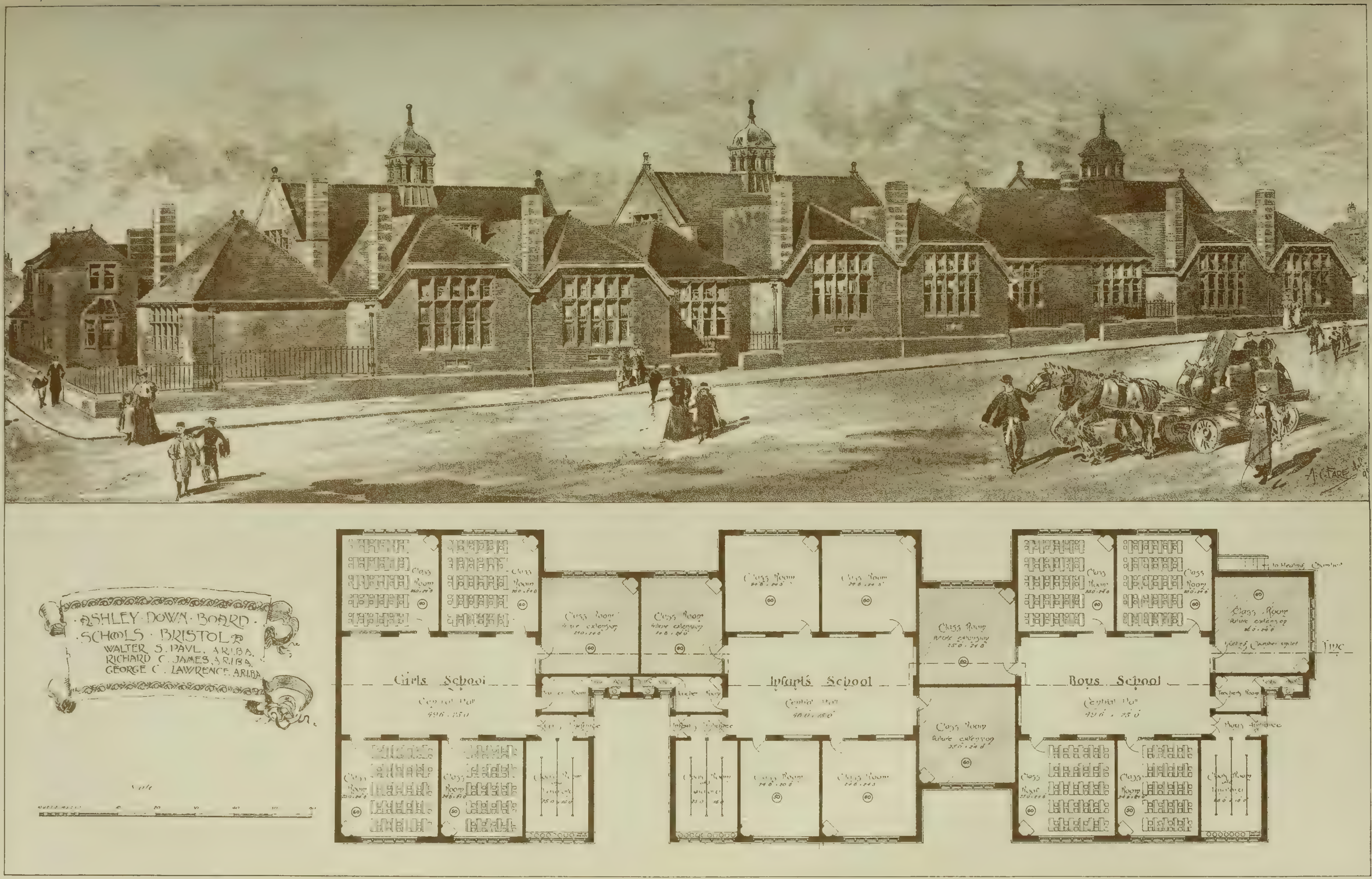


6.

SILVER MEDAL STUDIES OF DRAPERY BY HUBERT·E·BULMER

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.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Class Room 250 · 24 0 (60)
Class Room future extension 21 0 · 14 0 (60)
Class Room future extension 14 8 · 14 0 (60)
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Class Room 24 8 · 24 3 (60)
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Class Room 250 · 24 0 (60)
Class Room 250 · 24 0 (60)
Class Room future extension 26 0 · 24 0 (60)
to Heating Chamber
Heating Chamber under
Line
Girls School
Central Hall 49 6 · 25 0
Infants School
Central Hall 40 0 · 25 0
Boys School
Central Hall 49 6 · 25 0
Teachers Room
Teachers Room
Teachers Room
Girls Entrance
Infants Entrance
Boys Entrance
Class Room 25 0 · 24 0 (60)
Class Room 24 0 · 21 0 (50)
Cloak Room and Lavatories 25 0 · 16 0
Cloak Room and Lavatories 25 0 · 16 0
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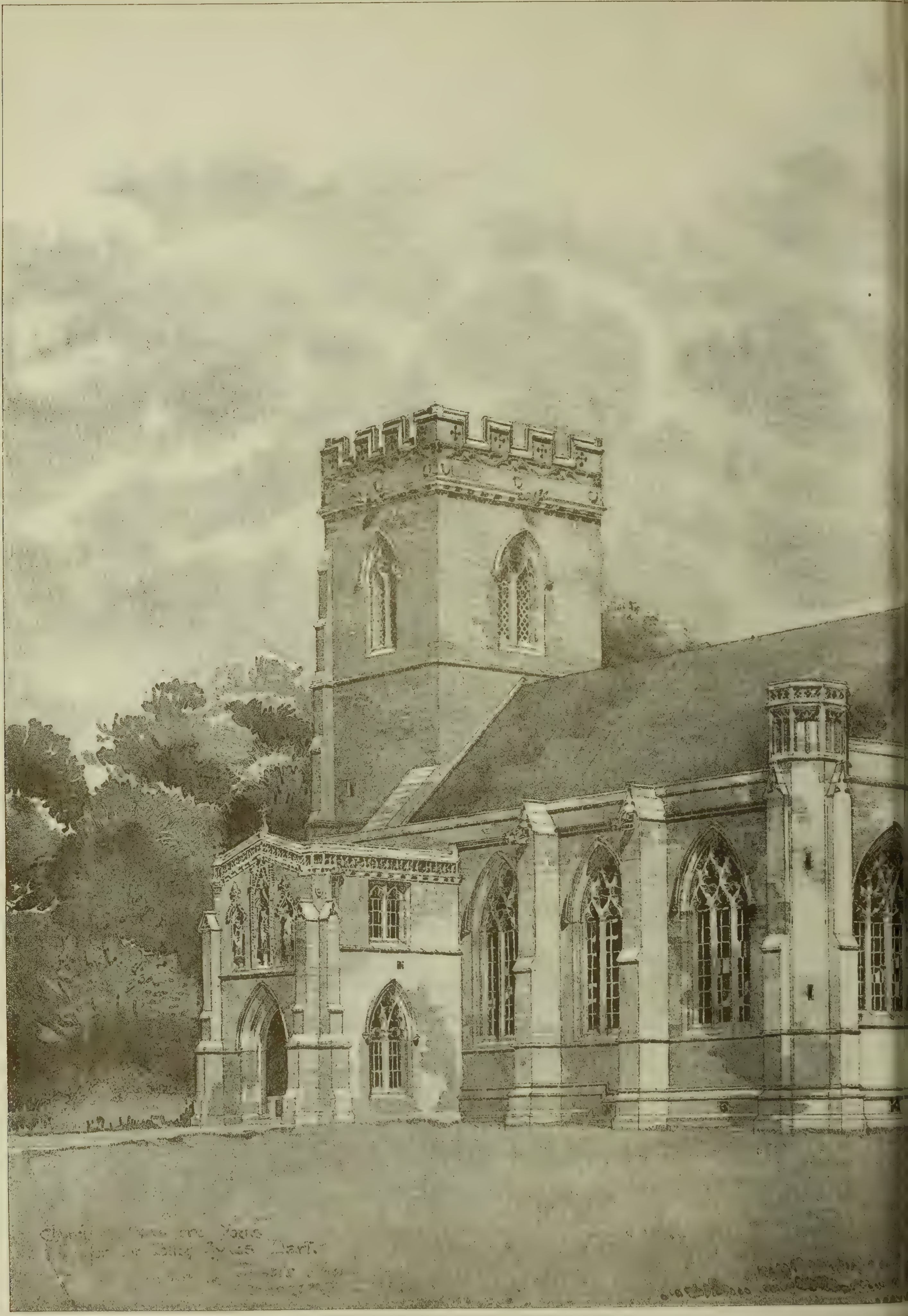
Class Room 24 0 · 21 0 (50)
Cloak Room and Lavatories 25 0 · 16 0
Scale
10 20 30 40 50 60

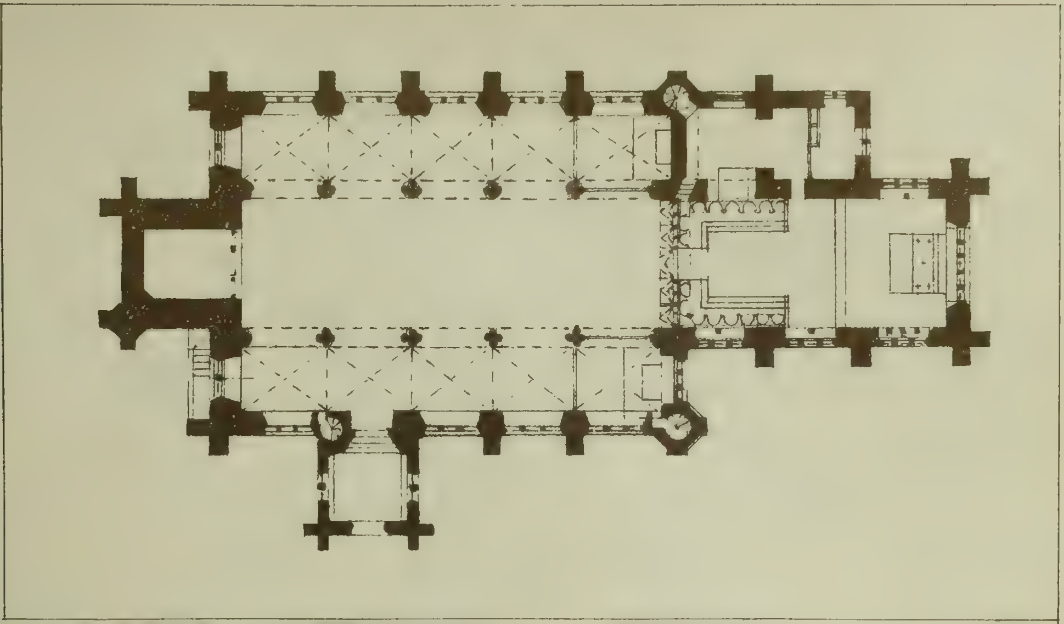
·ASHLEY·DOWN·BOARD·
·SCHOOLS·BRISTOL·

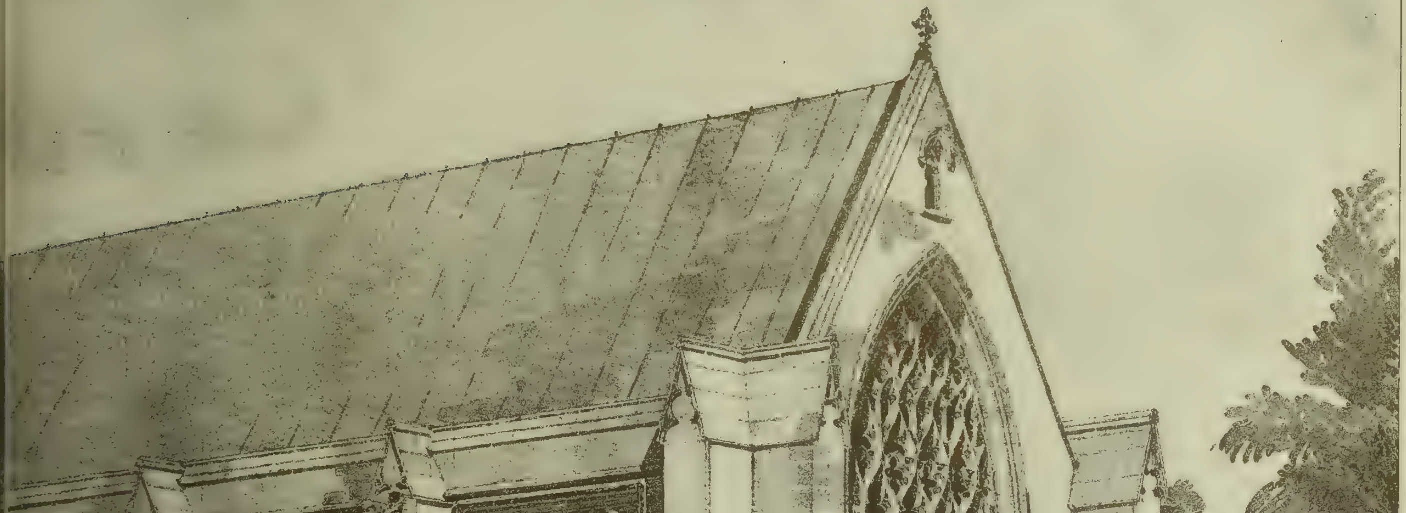
WALTER S. PAUL, A.R.I.B.A.
RICHARD C. JAMES, A.R.I.B.A.
GEORGE C. LAWRENCE, A.R.I.B.A.

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.



CHURCH AT SLEDMERE FOR SIR





TON SYKES TEMPLE MOORE ARCHT

"PHOTO-TINT" by James Akerman 6 Queen Square London W.

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CAMPDEN HILL COURT, KENSINGTON.—SILVER MEDAL STUDIES OF DRAPERY.—CHURCH AT SLEDMERE.—ASHLEY DOWN BOARD SCHOOLS, BRISTOL.—STAR LIFE ASSURANCE OFFICES, DUBLIN.—SCREENS IN TRINITY CHURCH, FECAMP.—FURNITURE FROM THE COLLECTION OF LORD HENRY THYNNE.—RESIDENCE AT WOOLACOMBE, NORTH DEVON.

Our Illustrations.

CAMPDEN HILL COURT.

THESE flats are now in course of erection, on a site at Campden Hill-road, Kensington, for the Kensington Estates Company. They are divided into five blocks of seven floors, each block being served by its own staircase, passenger, and goods lift. The plans have been arranged so as to give complete isolation to the service department in each flat. This is effected by providing a special passage by means of which the kitchen, with its offices, the table-maid's pantry, and the servant's bedroom with its accessories, intercommunicate without intruding on the halls and corridors. This isolation is further enhanced by the introduction of a service-room or lobby (fitted with shelves and a revolving dumb waiter) between the kitchen and the dining-room, obviating the necessity of the table-maid leaving the latter during the serving of meals. The elevations are faced with red bricks; the porches, cornices, balconies, window dressings and dormer windows are in stone. The architect, in the early stages of the work, was Mr. Fred. Thos. Pilkington, since deceased. At his death the work was intrusted to his son, Mr. E. C. Pilkington, of Museum-street, W.C., and from his designs, and under his superintendence, the buildings are now being carried out. The contractor is Mr. Thomas Boyce, of Hart-street, W.C.

SILVER MEDAL STUDIES OF DRAPERY.

MR. HUBERT E. BULMER has selected some remarkably fine examples of historic sculpture in illustration of his subject, and his drawings, for which a National Silver Medal was awarded, will be valued for their essentially practical and useful character by carvers and modellers particularly, and by our artistic readers generally. Many a building is marred by the lumpy and characterless drapery of the aimless figures intended to enhance its decorative effect, and studies such as these, made with so much care by Mr. Bulmer, cannot fail to display the great importance of a worthy attention to so essential a feature in all figure work as the folds and arrangement of its drapery, whereby the pose and proportions of the figure itself may be suggested and emphasised. To the cultivated artist this fundamental principle appears but a truism, though he will realise to the full how very seldom in everyday work the subject receives anything approaching an intelligent appreciation in the ornamentation of contemporary building. Nothing adds so much to the charm of a well-proportioned building like good figure sculpture, and any aid towards the development of such work must be valued by all lovers of beauty in design. The following notes furnished by Mr. Bulmer give descriptive particulars of each of the examples delineated on the accompanying plate, and they will be useful for reference. All the subjects were drawn in South Kensington Museum:—No. 1. (From a plaster cast.) The Annunciation. The original of stone, by Donatello (b. 1386, d. 1466), was executed by Bernardo Cavalcanti, and is in the Church of Santa Croce, Florence. No. 2. (From a plaster cast.) Angel kneeling, holding a candelabrum. By Luca della Robbia (b. 1400, d. 1482). The original, of terracotta, is in the sacristy of the Duomo, Florence, Italian, 1448. No. 3. (From a plaster cast.) "The Fates." The originals, of Pentelic marble, formed part of the group representing the birth of Athené, in the eastern pediment of the Parthenon in Athens. They were removed by Lord Elgin between the years 1801 and 1803, and are now in the British Museum. The Parthenon was erected under the superintendence of Phidias, and was completed about the year 438 B C. No. 4. (Terracotta). Ariadne deserted at Naxos. Traces of colour from a tomb at Tanaora in Bœotia. 4th century B.C. No. 5. (From a plaster cast). The original is in the Akropolis Museum. Figure of Victory tying her sandal. The original relief of marble formed part of the balustrade round the temple of the Wingless Victory (Nike Apteros) in Athens. Date probably about 400 B.C. No. 6. (From the original). Medallion in bronze, decorated in relief with the infant Hercules on a couch strangling the serpents sent by Juno, who appears above in a car drawn by peacocks, whilst beside the couch are Alcmena and an aged woman in attitudes expressive of amazement and terror. This subject was probably the work of Sperandio. North Italian, about 1480. Diameter, 12¾in. No. 7. Plaster cast of a water-nymph, from the original of the "Fontaine des Innocents" near the Halles Centrales, Paris, by Jean Goujon. Date about 1550-60.

ST. MARY'S CHURCH, SLEDMERE.

THE church of St. Mary, Sledmere, was completed in 1898, for Sir Tatton Sykes, Bart. The tower is the only part remaining of the Mediæval church, which had been pulled down at the close of the last century. The plan, which follows the lines of the Mediæval foundations, consists of a nave, aisles, choir, south porch, western tower, and sacristy north of the choir. The nave is of five bays, and is 60ft. in length, and 18ft. 6in. between the columns, and the total internal width across the aisles is 41ft. The chancel is the same width as the nave, and 40ft. in length. The height to the internal ceiling of nave and chancel is 32ft. 6in. The roofs of the nave and choir are in oak covered with lead. The internal fittings of the church are of oak, and of these the rood-screen, choir-stalls, organ-case, and reredos of the high altar are unusually beautiful examples of modern work. The nave arcades have massive columns with moulded caps, and the aisles of the church are vaulted in stone, with richly-carved bosses at the intersection of the ribs. The stone carving throughout is remarkably delicate in execution, one of the richest portions being the reredos above the altar in the north chapel. The choir windows, which are all filled with excellent stained glass, have a double order of tracery, which gives an uncommonly rich effect to this part of the interior. Externally, the southern porch with its parvise is a good feature, and well in accord with Yorkshire work. Three niches above the doorway hold statues of the Blessed Virgin Mary holding the Infant Saviour, and St. Peter and St. John of Beverley, stand on either side. Octagonal staircase turrets stand at the eastern angles of the aisles, and give access to the rood-loft, organ-chamber, and roof gutters. The roof of nave and channel is of one level from east to west; the aisle roofs are flat; the buttressing and parapets are simple and fitting adjuncts to a church of solidity of construction. The whole of the work has been carried out from the designs and under the supervision of Mr. Temple Moore, architect, Well-walk, Hampstead, London, N.W. The contractors were Messrs. Thompson, of Peterborough.

ASHLEY DOWN BOARD SCHOOLS, BRISTOL.

THESE schools have been lately erected at Horfield, Bristol, for the Bristol School Board. The materials of which the buildings are composed are local bricks with Bath stone dressings, the roofs being covered with Bridgwater angular tiles, and the floors laid with wood blocks. The general contract was let to Mr. E. Walters, the plumbing and sanitary works being carried out by Mr. G. F. Tuckey, whilst Mr. S. White acted as clerk of works. The joint architects for the work were Messrs. Walter S. Paul and James, AA.R.I.B.A., and G. C. Lawrence, A.R.I.B.A., whose design was selected in competition in 1897.

THE STAR LIFE ASSURANCE OFFICES, DUBLIN.

THE Star Life Assurance Society of London are now building branch offices in various parts of the United Kingdom. They have acquired an important site at Dublin facing College Green, with a return frontage to Trinity-street, and building operations will shortly be begun. The perspective sketch shows the building as it will be when completed; but, owing to existing subleases, it will probably be some years before the corner itself can be dealt with. Meanwhile, the main portion fronting College-green will be proceeded with. The premises consist of shops on the ground floor facing College-green, with shops or offices in Trinity-street, the upper portion being arranged as suites of offices, all of which are particularly well lighted. In the basement will be a safe-deposit, with an entrance and general office in Trinity-street. A lift will be provided to all floors. The whole of the external elevation is in stone, the roof being of lead and slates. The work will be executed from the designs and under the superintendence of Mr. Arthur Blomfield Jackson, Mecklenburgh-square, architect.

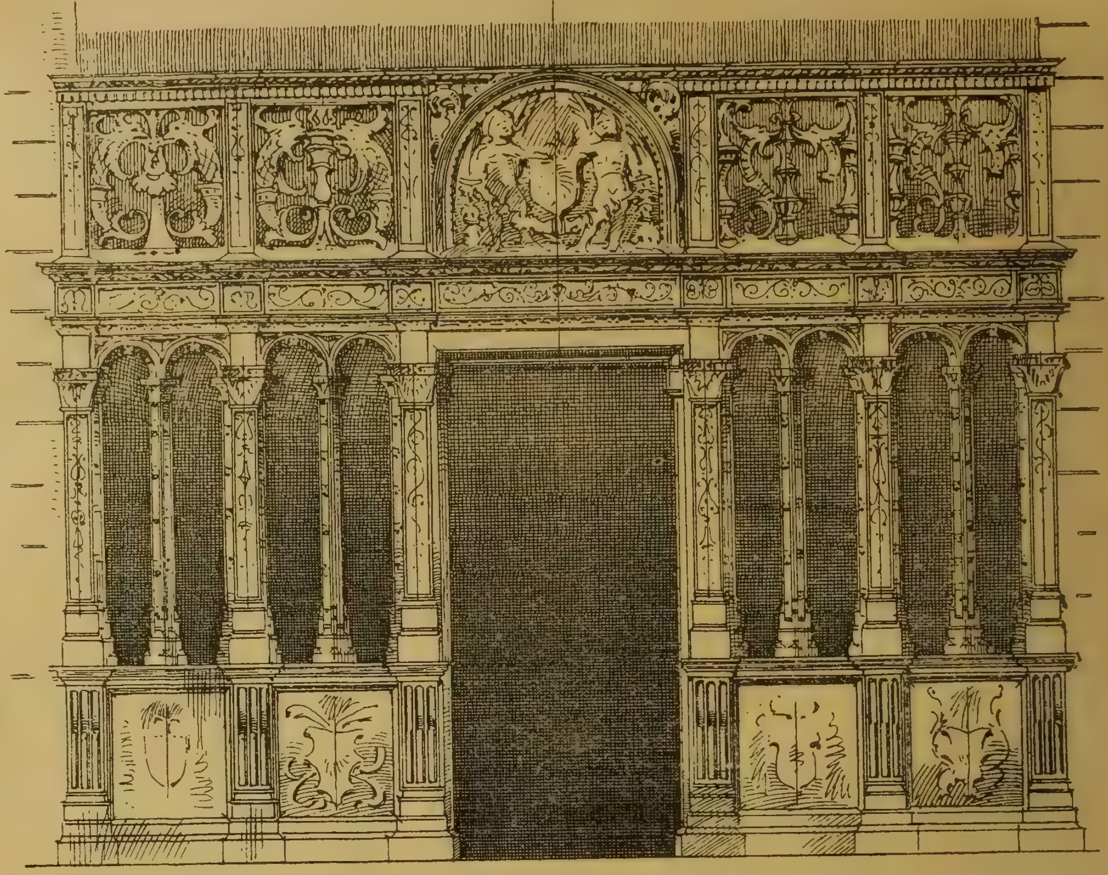
SCREENS, TRINITY CHURCH, FECAMP, FRANCE.

THE square and charmingly proportioned Early Pointed belfry of S. Trinité Church, Fécamp, familiar to the architectural student, surmounts the great monastic edifice which was almost entirely rebuilt towards the end of the 12th century. The east end, however, preserves the original lines of the earlier basilica erected by Duke Richard. The modern front forming the façade of the church was added in 1696. Inside an almost cathedral-like splendour distinguishes the building, and notably among the glories of the fabric are the beautiful Renaissance screens to the chapels, one of which we illustrate to-day, from the measured drawings of Mr. W. T. Partridge, whose details of the work display its exquisite detail, and indicate its suggestiveness of design. Besides the screens, there must be noted the lovely little 15th-century tabernacle, enshrining the footprints of the angel. It was presented by Gilles de Duremont, one of the judges of Jeanne d'Arc. The 16th-century marble shrine, for the housing of the famous relic of the Precious Blood, still an object of pilgrimage, stands facing the apsidal chapel. The screen to the chapel of St. André is an exquisite piece of work, and close by remain the very fine tombs of Abbot Guillaume de Putot, 1297, and Abbot Robert de Putot, 1329. The monument of the twelfth abbot, Thomas, stands in the chapel of St. Jean. He died in 1297. Other chapels contain other tombs of other abbots, the earliest being that of Abbot Richard I., dating 1223. At the Revolution many monuments at Fécamp were destroyed, and the over-restorations of the building have done much to damage its historical interest and beauty. The Renaissance work has suffered less from this cause than the Mediæval work. Mr. Partridge is a contributor to the *American Architect*, and we are indebted to our Transatlantic contemporary for the sketches herewith reproduced.

◆

For some time back Messrs. William Baird and Co. have been conducting boring operations on the estate of Auchinreoch, a mile to the east of Kirkintilloch. A good seam of coal was come upon, a shaft sunk, and the necessary pithead buildings erected. Now specifications have been issued for the erection of 100 miners' houses at Twechar, which village will be almost doubled in size.

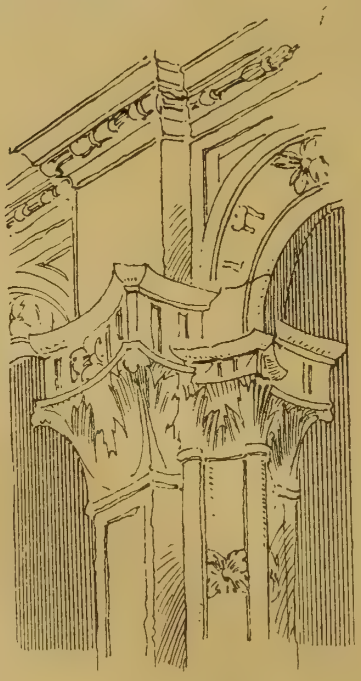
The new board schools which have been erected in the Rookery-road, Handsworth, Birmingham, were opened last week. The schools, which are Renaissance in style, will accommodate 1,060 children and infants, there being five classrooms and a babies' room in the infants' department, and five classrooms each in the boys' and girls' departments, arranged around a central hall. The heating and ventilation have been carried out on the plenum system by Mr. William Key. The cost of the schools, playgrounds, and fencing, exclusive of the site and furniture, amounts to £14,000. The architect is Mr. Edward Holmes, and the builder Mr. John Webb.



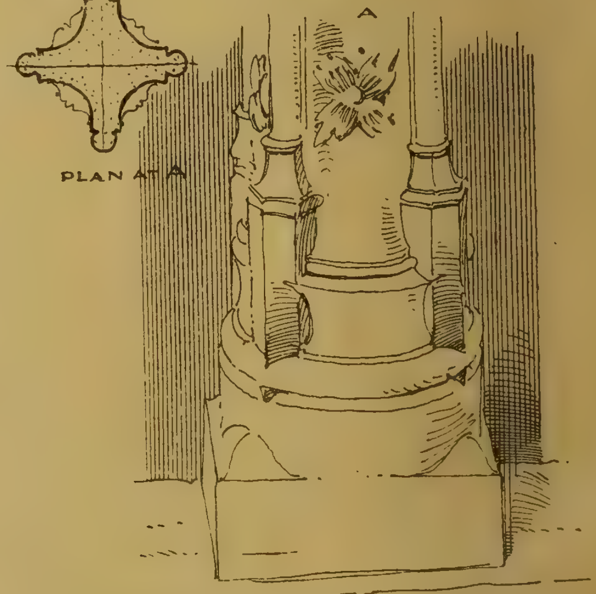
ELEVATION OF SCREEN NO
FROM CHOIR, LOOKING OUT

SCALE 1 METRE

SC



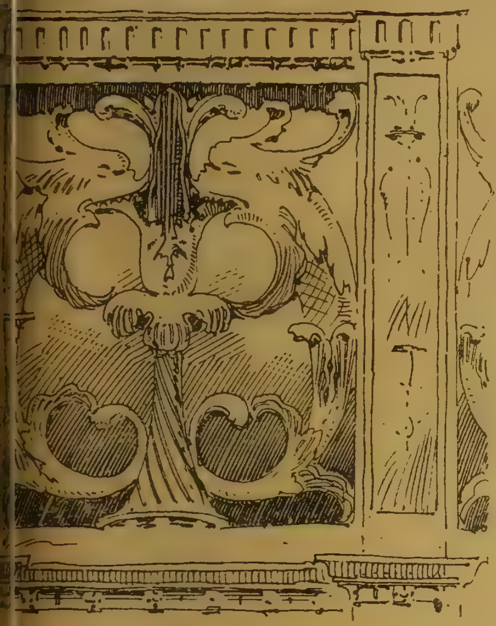
PILASTER CAPITAL
SHOWING GOTHIC TENDENCY
TO INTERSECTIONS



BASE OF INTERMEDIATE
COLUMNS

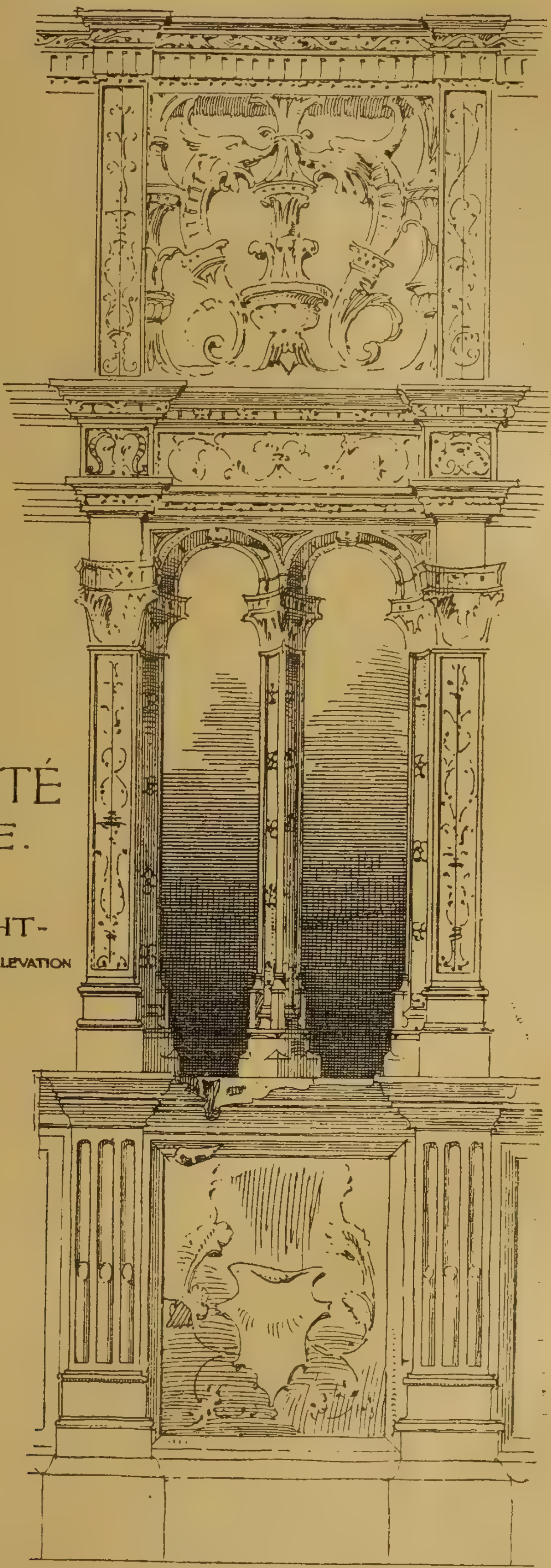
Marshall Sc

UPPER PART DESTROYED



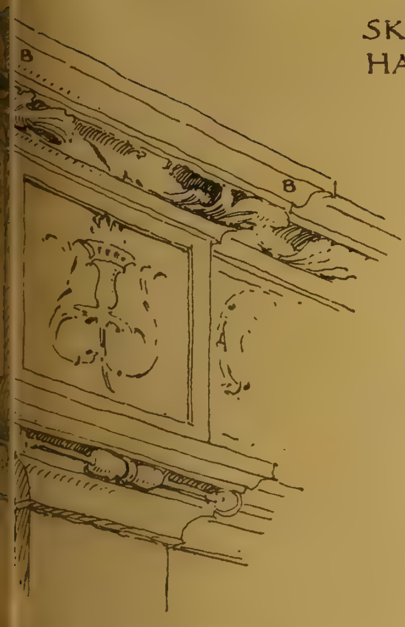
TAIL OF LEFT-HAND ATTIC

S IN L'EGLISE DE LA TRINITÉ
FECAMP – FRANCE.



SKETCH OF RIGHT-HAND BAY SEE ELEVATION

W. T. PARTRIDGE, del.



ETAIL OF CORNICE

D RETURN OF LEAF ORNAMENT 'B' B'

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI., may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

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Pavilion.—We don't think you could do better than use Willesden paper. It is cheap, and quite insect-proof.

Safe.—Hobbs and Co. take the lead, we think. We should go to them in preference to the firm you name.

Footway.—Val de Travers is certainly the better. So is Claridge's.

Valuer.—Yes; "reasonable" expenses. But really you could hardly charge on what we should call a holiday-trip scale.

G. C. C.—Quite right; thanks. The small slip is hardly worth correcting.

R.—You can get very decent floor-boards at a little less than the price you name at T. Forman's, Walnut Tree-walk, Lambeth. We have found him always reliable.

Garnet.—You mean old Dorking lime? Nearest dependable people to you are the Brockham Brick Co., Brockham, near Betchworth.

Robert Rogers.—Hart, Son, Peard, and Co., Drury-lane, W.C., or Cox, Son, Buckley, and Co., 18, Tavistock-street, Covent Garden, W.C.

Correspondence.

A MISSTATEMENT CORRECTED.

To the Editor of the Building News.

Sir,—It has come to our knowledge that certain former employees of the firm, who were discharged by us, have sent out to our customers a circular containing misleading statements which may possibly be injurious. The matter has been placed in the hands of our solicitors, who will take steps to put an effective stop to such statements.

The firm of Julius Sax and Co., which has been established for 50 years, was recently reconstructed with a view to introducing additional working capital and more vigorously prosecuting the business. The business will be carried on precisely as heretofore, at the address below, by a thoroughly competent staff and under the guidance of well-known electricians, while at the same time the services of such of the former staff who have proved themselves capable and competent have been retained. Ample working capital has been provided for the purpose of improving our machinery and adding to our already extensive stock, and all contracts in hand will be executed, we hope, to the entire satisfaction of our customers.

In order to prevent servants whose services we have not thought it right, in the interest of the company, to retain, from prejudicing our customers, we think it is only necessary to call your attention to the above facts.—I am, &c.

Julius Sax and Co., Ltd.

119, Coldharbour-lane,
Camberwell, London, S.E., Sept. 7.

CHIPS.

The Duchess of Devonshire laid, on Friday, the foundation-stone of the new church of St. Aidan, at Carlisle, which is being built in Warwick-road at a cost of from £7,000 to £8,000 from designs by Mr. C. J. Ferguson, F.S.A., architect. The site of the church was given by the Duke of Devonshire, and is situated at the south end of the Waterworks-lane, in a part of the city which has sprung up since the last new church was erected about thirty years ago, and which comprises a population of about 4,000.

In connection with the electric-tram system about to be adopted at Newcastle-on-Tyne, we are informed that an electric-power station is to be erected, for which Mr. B. F. Simpson and Mr. J. Savage, of that city, have been appointed architect and quantity surveyor respectively.

The town council of Tunbridge Wells are about to endeavour to enlarge the borders of their town by including two thickly populated outlying districts within the borough, one being known as St. Peter's estate, and neighbouring land, comprising 166 acres and having an estimated population of 5,000, and the other as New Town, Rusthall, comprising 141 acres, and having an estimated population of 1,000. The Housing and Working Classes Committee have submitted an amended and less costly scheme for the housing of the working classes, but as their reduced plans is estimated to cost at least £25,000 for 53 cottages and 30 tenements, decision on the matter has been deferred.

The preparation of the sewerage scheme for Manaos, Brazil, has been intrusted to Messrs. Beesley, Son, and Nichols, civil engineers, of 11, Victoria-street, Westminster. The population to be provided for is about 60,000, and is rapidly increasing.

The cottage hospital, Lytham, is being warmed and ventilated by means of Shorland's patent Manchester grates and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The band-stand erected in the Tunbridge Wells Recreation Ground by Mr. Councillor Elvy Robb to the memory of his late father was opened on the 7th inst. The stand is octagonal in shape, and was built by Mr. F. Skinner, from a design by Mr. Henry Elwig, jun. It has a brick base surmounted by a course on which rests a wood panelling with circular mouldings painted in white and blue. Around are eight pitch-pine fluted and moulded columns supporting a bell-shaped tile roof, over which is a lead-covered pinnacle with ornamental finial.

A special meeting of the Executive of the Scottish Building Trades' Federation was held, on Friday, within the Glasgow Building Trades' Exchange, Mr. James Leslie, of Aberdeen, President of the Federation, in the chair. Representatives were present from Inverness, Aberdeen, Dundee, Perth, Edinburgh, Hawick, Hamilton, Coatbridge, Glasgow, &c. The report of the secretary, bearing upon the extension and consolidation of the federation throughout the country, was considered, when a suggestion to divide the country into districts, and to appoint special committees in each to carry out the work was heartily approved of, and arrangements were made for the annual meeting of the federation, which is to be held in Glasgow at the end of October.

At a special meeting of the town council of Taunton, held on Thursday evening in last week, it was decided to adopt the septic tank system of sewage disposal, the cost of the proposed change being about £22,000.

The town council of Ayr agreed on Monday to proceed with the erection of the new town hall on the old site, utilising the additional adjacent properties purchased for the purpose of improving the entrances and exits, the erections to include a police court. The estimated cost of the building is £10,000.

Intercommunication.

QUESTIONS.

[12313.]—**Discoloured Water in Bath.**—I have built a swimming-bath with bricks, and lined with Portland cement. The water is supplied from a well in chalk, and is pumped up with a windmill. The bath is covered over with glass. When first filled the water is beautifully clear; but after a week it begins to get green and turbid, and eventually becomes quite thick with a vegetable growth. Can anyone tell me how to cure or prevent this?—J. J.

[12314.]—**Solder.**—Can any of my fellow readers inform me of a mixture that is more fusible than ordinary tinman's solder, but still stand the same breaking strain?—Plumber's Mate.

[12315.]—**Turret Clocks.**—Will someone kindly inform me as to the best illustrated work upon turret clocks?—W. A. P.

[12316.]—**Solvent for Gum.**—Will any reader kindly let me know the best and cheapest solvents for "gum euphorbium."—An Occasional Reader.

REPLIES.

[12306.]—**Architect's Charges.**—In reply to "Perplexed," I consider that a fair and reasonable charge to the person withdrawing from this scheme would be from 1½ to 2 per cent. commission on the total of estimated cost.—Alafred.

The title of "Professor" has been conferred by the Emperor William on the sculptor, Herr Walter Schott.

The new graving dock at Port Talbot was opened on Tuesday week by Mrs. Mordey, of Cardiff. The site of the dock covers about six acres, and the graving dock is 435ft. long, 110ft. in breadth, and 60ft. entrance. The engineers were Messrs. P. W. and C. S. Meik, London, and the contractors Messrs. Topham, Jones, and Railton, also of London.

New buildings for the Runcorn Constitutional Club are to be erected on a prominent site in Greenway-road in that town, from designs from Mr. Samuel Davies, M.S.A., architect, of Runcorn and Frodsham.

Messrs. Methuen and Co. will publish the life of Sir J. E. Millais towards the end of September. The book will be in two volumes, and will contain no less than 300 illustrations. The life is edited by Sir J. E. Millais's son, Mr. John G. Millais, and contains the full history of Millais's extraordinary boyhood, of his early struggles, of the founding of the pre-Raphaelite Brotherhood, for the first time given in authentic detail, of the painting of most of his famous pictures, of his friendship with many of the most distinguished men of the day in art, letters, and politics. There will be a large number of letters to Lady Millais describing the circumstances under which his most famous pictures were painted.

The new masonry viaduct on the Great Western Railway's system at Penponds, Camborne, built by Messrs. Relf and Sons, contractors, was used on Sunday for the first time in lieu of the old wooden viaduct, which will be torn down.

At a meeting of Ayr Town Council on Monday, it was reported that the depth of available domestic water supply in Loch Finlas was 5ft. 10½in., as compared with 9ft. 9¾in. at the same date last year. It was agreed to proceed with a new storage reservoir at the filters to contain 7,000,000 gallons at an estimated cost of £7,645, and to erect pumping apparatus to pump the water from the old scheme at an additional cost of about £5,000.

Colonel W. Langton Coke, M.I.C.E., and Dr. S. W. Wheaton, Local Government Board inspectors, will hold an inquiry at the Public Offices, Egremont, on Tuesday next, into the application of the Wallasey Council for sanction to borrow £9,030 for the purchase of land for the extension of their Infectious Diseases Hospital and for purposes of a depot, and £18,500 for purposes of electric traction.

At the meeting on Monday of the Surveying Committee of the City Council of Bath a sub-committee reported that the extras received by the surveyor, Mr. Fortune, for the last three years had averaged £89 per annum. They recommended that his salary be raised from £350 to £450, the increase to date from Michaelmas next. The surveyor hoped this would not be looked upon as an increase. The Chairman: It is an adjustment. Mr. Fortune asked that it might date back, but no proposition to that effect was made, and the recommendation of the sub-committee was adopted.

The foundation-stone of new British schools, in course of erection in Knowsley-road, St. Helens, Lancs, was laid on Friday. The site adjoins the Congregational Chapel in Knowsley-road, and when completed accommodation will be found for 800 scholars, the cost of the schools, apart from the land, being about £1,500. The plans were prepared by Mr. F. S. Binam, and the work of erection has been intrusted to Messrs. J. Patterson and Sons, of Liverpool.

LEGAL INTELLIGENCE.

DEFRAUDING THE L.C.C.—James Hutchens, timekeeper, and Benjamin Goulding, bricklayer, pleaded guilty at the London County Sessions on the 7th inst. to conspiring to obtain by false pretences from the L.C.C. several sums of money. Hutchens had deliberately used his position to falsify books on a large scale, in conjunction with Goulding, who was a bricklayer employed on the same works. When a workman fell ill, or was absent, he was allowed to write a request for another man to draw his wages. The two prisoners had taken advantage of this rule, and sent in requests at different times from different addresses, and received money. Goulding was sentenced to six and Hutchens to nine months' imprisonment.

AN ARCHITECT FINED FOR DISPLACING PAVEMENT.—At the Colchester Police-court on Tuesday week, the Colchester Brewing Company, Ltd., East Hill, Arthur Grimwood, trading as Grimwood and Sons, builders, Sudbury, and George Henry Page, architect, Culver-street, were summoned at the instance of the borough surveyor for displacing the pavement at East Hill without the consent of the corporation. The town clerk (Mr. H. C. Wanklyn) explained that the information was laid under the 149th section of the Public Health Act of 1875, which stated that in all highways repairable by the inhabitants at large all pavements, stones, and other materials thereof should be under the control of the Urban Authority, and any person displacing or removing them without the consent of that authority should be liable to a penalty not exceeding £5, and a further penalty not exceeding 5s., for every square foot of paving or other material displaced or taken up or injured. On August 24 the borough surveyor visited a building in course of construction—it was a new floor—for the Colchester Brewing Company, adjoining their premises at East Hill. He found that two excavations had been made in front of the buildings under the pavement, and for the purpose of such excavations two large pieces of pavement had been removed, 10ft. in length and 4ft. in width. He at once called the attention of the foreman of the work to what he had discovered, and told him the work must not proceed. The foreman said, "Well, these excavations were not shown on my plans, but the architect told me to go on with the work." The surveyor wrote at once to Mr. Page, the architect of the building, calling his attention to the matter, and telling him that the pavements must not be removed. He also wrote to the builders at Sudbury pointing out what had been done, and telling the firm that he had communicated with the architect on the subject. On August 30 Mr. Page called at the borough surveyor's office and declined to stop the work. Mr. Page handed him a plan of some proposed further buildings which were to be erected above the floor of the original plan for which permission had been already granted. Upon this new plan were shown two bays at that time in course of construction. In the ordinary way the surveyor would have brought that plan to the committee for further consideration, but the roads and drainage committee resolved that they could not sanction it now that the work had already proceeded. The town clerk added that as far back as May last the original plans, showing the proposed new floor, were passed, but they showed nothing of the bays or cellar gratings or lights which it was now proposed to include in the building. And so the work was begun, a hoarding being erected round the front of the place, but behind this pavements were taken up and the excavations commenced. Mr. Page must have known at the outset that he had no right to move the pavement, and certainly after receiving the borough surveyor's letter. Mr. Herbert Goodyear, borough surveyor, supported the charge. Mr. E. A. Slater, from the borough surveyor's office, corroborated. Mr. Young pleaded that the Brewing Company had taken all the precautions necessary where buildings were to be erected. They engaged an experienced architect, and entered into a contract with a well-known firm of builders, so that they had a right to assume that the buildings would be erected in conformity with the Act. With regard to the case against Mr. Page and Mr. Grimwood, there had been some amount of misunderstanding with reference to the matter. On the first plan which was submitted and approved there was a large cellar, but there was no way of access of light and air except through these excavations which were made. Mr. Page on Aug. 16 prepared a second plan, and sent it to the office of the borough surveyor. That plan was sent back the same day with an intimation that the block plan was not on. Mr. Page assumed that in every other respect the plan was in order, and that he might go on with the work. The builder was instructed accordingly, and the builder, concluding that Mr. Page had obtained consent, the work went on till it was stopped by the managing director of the Brewing Company, the first intimation they received that anything was wrong. Mr. Page, the architect, stated that they discovered that the plan showing the proposed excavations had been returned by a clerk in the office unbeknown to the borough surveyor. The surveyor then said, "I'll call a special meeting and pull this thing through for you," and witness took it for granted that he might go on with the work. Mr. Goodyear, recalled, denied absolutely having made the statement attributed to him by Mr. Page. Mr. Page knew well enough that no assistant in his office would have power to sanction any work. Mr. Grimwood said the Colchester Brewing Company had no control over his work, which was left in charge of his foreman, who would act upon instructions from the architect. The Bench decided that the Brewing Company should be allowed to pay the costs of the case on condition that they reinstated the pavement, and put right the excavations, and the case would be adjourned for one month. Mr. Page would be fined £1 and 14s. 6d. costs, or in default a warrant of distress, and the case against Mr. Grimwood would be dismissed on payment of 16s. 6d. costs.

THIN WALLS AT DUNDEE.—Sheriff Campbell Smith and a jury inquired at Dundee on Monday into the death of John Butchart (61), mason, Brook-street, Broughty Ferry, who was, on Friday, July 7, when engaged at two semi-detached cottages in course of erection in Hill-street, Monifieth, so severely injured by the upper part of a partition wall falling upon him that he died in Dundee Royal Infirmary the same day. John Scott Miller, builder, Monifieth, said the partition-wall was 27ft. in height, and built of brick 6in. thick. There was a good deal of wind on the day of the accident, and in his opinion the wind was the cause of the collapse of the wall. Sheriff Campbell Smith said he was of opinion that a 6in. wall 27ft. high was not a safe erection, and the builder or the architect who devised such a wall and put it up ran a risk of being tried for culpable homicide if any disaster occurred. There was far too much of this slum work in big towns, and Glasgow was worst of all. Dundee followed Glasgow too much in the taste for the cheap, showy, and nasty. What had come out in this case was a caution both to architects and to builders. The occurrence was, no doubt, an accident; but it was an accident against which builders ought to provide. A verdict of accidental death due to fracture of the skull was returned.

A. E. LILLIE, LIMITED.—A winding-up order having been made against this company on Aug. 9, the statutory meetings of creditors and shareholders were held on Friday at the Carey-street offices of the Board of Trade. Mr. G. S. Barnes, Senior Official Receiver, presided. The chairman said the case was one which showed to what uses—or rather abuses—the Companies Acts could be put. The company was registered on Oct. 29, 1897, with a nominal capital of £20,000, in shares of £1 each, to purchase the business of a timber and builders' merchant, &c., at Landport, Portsmouth, belonging to Mr. A. E. Lillie, who took it over in 1879, and carried it on alone until the registration of the company. At that time Messrs. Palfreman, Foster, and Co. were unsecured creditors of Mr. Lillie for upwards of £18,000, and they suggested the formation of the company, the sole and avowed object being to provide security, by way of debentures, for their outstanding debt. Mr. Lillie stated that prior to the formation of the company he offered the firm named every scrap of security he could, but they refused to take it. It was in order to avoid registration of any charge under the Bills of Sale Act that the company was formed, Messrs. Palfreman, Foster, and Co. assisting in the promotion, and paying one-half of the registration expenses. By the articles of association, Mr. Lillie was appointed governing director for life, with power to appoint and remove other directors. By an agreement dated December 29, 1897, Mr. Lillie sold the business to the company for £15,000, in fully-paid shares, the company undertaking to discharge the liabilities. No balance sheet had been previously prepared, but a statement of affairs was made out on November 1, 1897, showing liabilities £25,980, and assets valued at £35,687, and the purchase price included about £5,292 for goodwill, which was increased by subsequent adjustments to £6,037. On December 31, 1897, an agreement was entered into between the company and Messrs. Palfreman, Foster, and Co., providing that debentures should be issued to them as security for a debt then due, or accruing due, for £18,754, and for further advances. In January, 1898, Mr. Lillie appointed his foreman, Mr. T. E Jenkins, to be a director, and in August of the same year he also appointed Mr. E. C. Hall, a representative of Messrs. Palfreman, Foster, and Co., to be a director. The company had no secretary. Hall was present at one meeting. Mr. Lillie constituted about 13 meetings by his personal presence only. He appeared to have sealed all deeds and documents, and to have signed all cheques for the company. The only shareholders in the company were Mr. Lillie, who held 15,000 fully-paid shares, the seven signatories, and Mr. Hall, who held five shares. On January 20, 1898, debentures for £15,000 were issued to Messrs. Palfreman, Foster, and Co., and further debentures for £2,600 had been issued to other persons. On June 29 last a receiver was appointed on behalf of Messrs. Palfreman, Foster, and Co., and on the following day he took possession of the company's property. The statement of affairs showed gross liabilities £50,222, of which £6,639 were expected to rank, and a surplus in assets of £7,809 was disclosed after providing for payment of all the creditors. As regards shareholders, there was a deficiency of £7,202. The chairman said there could be little doubt that the assets were grossly overvalued, and the receiver stated that he did not expect to realise sufficient to pay off the debentures. If that was so, there would not be a penny for the unsecured creditors. A letter had been received from Messrs. Palfreman, Foster, and Co., in which they stated that they were unable to submit any proposition to the unsecured creditors, but they believed that the debts would ultimately be paid in full. Mr. McKay, solicitor for Messrs. Palfreman, Foster, and Co., said he entirely dissented from the chairman's observation that they promoted the company. They did not promote the company in the usual sense of the term; they only found one-half of the registration expenses. The chairman said he used the word "promotion" in the sense of having assisted to form the company. After some discussion, the creditors resolved to leave the matter in the hands of the Official Receiver as liquidator, a committee of inspection being also appointed. The meeting of shareholders was adjourned *pro forma* for a week.

A BUILDER WITHOUT CAPITAL.—Arthur Sturt, trading as Arthur Sturt and Company, builder, Seventh Avenue, Heaton, came up for his first examination at Newcastle-on-Tyne Bankruptcy Court on August 31. His unsecured debts were returned at £1,086, and his assets £14 10s. Debtor began business four years ago. He had no capital whatever. He had formerly been a plumber at Elswick shipyard. When he was discharged from there he sought work. He obtained several plumbing jobs, and also orders for small house repairs. He then took up the building trade, and secured seven contracts to build houses for the Byker Estates Company. He had to agree to buy the land, and then sums were advanced him by the company as he went on building. When the houses were finished they were sold, the company received the money for the land, their advances, and interest on these, the balance, if any, being handed over to him. He had only one loss over these contracts of £150, but he lost over contracts at Hexham and Gosforth £200 and £300 respectively. He obtained credit as a contractor, and put the goods into the property he built. He could not say who got the benefit of that. The Registrar (Mr. Dendy) said debtor appeared to buy the land on credit, and he had to pay interest on that money, having no capital. Then he obtained advances as he went along, and had to pay interest on those. He obtained goods on credit instead of paying cash, and when a house was sold the land vendors had first claim on the purchase money for advances and interest. What was left was all that debtor had to live on and pay his creditors. Mr. Ruchdon: With regard to one of these Gosforth houses, don't you stand committed for trial to the Quarter Sessions for wilful damage? Debtor: For alleged wilful damage. The examination was adjourned till September 14.

WORKMEN'S COMPENSATION.—Mr. Commissioner Kerr and a jury disposed of a case, recently, in the City of London Court, in which William Slater, labourer, 98, Tilson-road, Peckham, sued Handyside and Co., Ltd., 104, Queen Victoria-street, the contractors for the ironwork used in the re-erection of the Metropolitan Tabernacle, Newington Butts, to recover, under the Employers' Liability Act, the sum of £50 for personal injuries sustained while in their service. Slater was working for the defendants in March last at Spurgeon's Tabernacle, and was coming down a ladder to go to the foreman for a "sub" (a payment on account), when the ladder, being too perpendicular, left the wall against which it was leaning. Had he remained on the ladder his case was that he would have been killed, so he jumped to the ground, a distance of 9ft. His foot was injured, and he had been out of employment for ten weeks. The defence was that the plaintiff should not have used the ladder which caused the accident, but should have descended by a permanent ladder. The misfortune was brought about entirely by the plaintiff's own fault. The jury found for the defendants. An application was then made to fix the compensation to which the plaintiff was entitled under the Workmen's Compensation Act. This was agreed at £6; but the costs of defending the employer's liability action will be deducted therefrom.

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At their meeting on Monday the Morecambe Urban District Council appointed Messrs. Beesley, Son, and Nichols, of Westminster, engineers to carry out the sewerage scheme at the usual commission of 5 per cent. upon the expenditure (exclusive of cost of land, way-leaves, &c.), and 1½ per cent. for quantities. The scheme is estimated to cost £62,300.

Our Office Table.

An excellent work has been done during the last few years by the Discussion Section of the Architectural Association, in the way of training young students to think and express themselves on architectural topics with lucidity, distinctness, and fluency, thus preparing members to explain their views to committees or individual clients. The meetings are held fortnightly on Friday evenings, alternately with those of the Association itself, and the programme for this section during the coming session is an attractive and suggestive one, running as follows:—1899: October 13, debate, "The Registration of Architects," to be opened by A. R. Jemmett and G. A. T. Middleton; November 3, "Brasses," G. H. Smith; November 17, "Tenement Houses for the Working Classes," Robert Williams; December 1, "Church Furniture," F. C. Eden. 1900: January 5, "The Public Monuments of London, Architecturally Considered," V. H. King; January 19, "Granite as a Building Material in the Channel Islands," C. B. Bone; February 2, "Opening up Land for Building Purposes," G. M. Nicholson; February 16, "Some Aspects of Modern Architecture," W. A. Forsyth; March 2, debate, "The Question of the Model By-laws," J. Humphrey Jones, B.A., J. H. Tyars, F. T. W. Goldsmith; March 16, "The Church of St. Francis, Assisi: a Study in Colour Decoration," W. E. Dobson; March 30, "Ventilation and Warming," F. W. Aldwinckle, jun.; May 18, "Some Essentials to Health," H. C. Lander; and May 25, "The Legal Position of the Architect," L. L. Macassey (barrister-at-law).

The report of Mr. Walter Armstrong, C.B., the director of the National Gallery of Ireland to the board of governors and guardians for the year 1898, states that the number of visitors during the year showed a slight decrease, due to the absence of American visitors during the summer season. The numbers were:—Free admissions—weekdays 49,840, Sundays 19,194; by payment—Thursdays and Fridays, 1,180; total, 70,214. The pictures purchased for the general collection included "Les Tours de Cartes," by J. B. S. Chardin, £750; "The Lost Daughter Restored," by Godfried Schalcken, £150; and "The Crucifixion," by Lucas Cranach, £40. Among the donations received was a portrait in oil by S. P. Hall of Charles Stewart Parnell, presented by Sir J. Brunner, M.P. A catalogue of the portrait gallery, which has long been wanted, has now been added. The report, which is dated July 12 and signed, concludes by stating that the plans for the extension of the gallery are now complete, and that the work is on the point of being commenced.

Mr. W. H. Bullock Hall, of Six-Mile Bottom, Cambs, calls attention to the little-known Roman camp at Caistor, some three miles south of Norwich, which he remarks is in an extraordinary state of preservation. The four sides of the parallelogram can be distinctly seen by the most careless observer, measuring 438yds. from east to west, and 362yds. from north to south. In some places the masonry, consisting of square-faced flints, with regular courses of bricks at intervals of about 30in., is still in perfect preservation for a height of 20ft. above the level of the ground. At the western end of the camp, where it rests on the River Tas, the vallum is very intermittent and much lower. But nearly in its centre the masonry of an advanced tower—perhaps connected with the Porta Decumana—is still extant. Conspicuous in the south-east corner of the inclosure of the camp, containing 34 acres in all, the tower of the church of St. Edmund overtops the vallum. The fossa there—i.e., along the east face—is 8yds. deep, measured to the top of the vallum. Huge detached masses of masonry lie about in the fossa, where an entrance road has been forced through the vallum. The whole camp is of unique interest.

The excavations of the Roman tesselated floor at Dorchester are practically finished. The design of the pavement is very elaborate, and, though considerable damage has been caused by the cutting of a drain through it before the discovery was made, a large proportion of the pavement is singularly well preserved. The floor is that of a tablinum or other principal room, and the work was evidently done late in the Roman era. The Dorchester Town Council have decided to approach the Dorset County Museum and the Dorset Antiquarian Society with a view to joint action being taken for the acquisition of the relics, which at present belong to a private person at Weymouth, who is developing the land for building purposes. Dr. Colley March inspected the floor on behalf of the British Museum on Thursday in last week, and it depends on his report whether a delegation from the museum will examine the relics. Besides the pavement, a quantity of pottery and human remains have been found.

In a letter to the *City Press*, Mr. Alfred Lyon, the chairman of the governing body of Sir John Cass Schools, shatters the commonly received tradition that Sir John Cass came from Scotland a "poor, shoeless boy," and subsequently obtained a situation with a butterman, whose daughter he married, inherited his father-in-law's wealth, and thus was enabled to found the school which bears his honoured name. But, continues Mr. Lyon, "who was Sir John, many may ask? Well, we do not know much of his history, but this we do know, that he was the son of Mr. Thomas Cass, a carpenter and builder, a man of good means and standing, who lived in Upper East Smithfield, in the lordship part of St. Botolph, Aldgate. We know that John followed his father's business, and grew into a good and capable man, that he served the City of London as one of its members in Parliament, that he occupied the position of a Sheriff of London, but unfortunately did not live to become Lord Mayor. But he thought of the poor, and in his lifetime founded the school that has been a blessing to thousands."

A long neglected tunnel running under a populous Metropolitan district between two important centres is about to be reutilised. Constructed in 1860 for the purpose of transmitting mails by pneumatic pressure between the General Post-office and Euston Station, it failed, partly because of its size—the diameter being 4½ft.—and partly because the leakage of air was greater than had been expected. The power of the engines employed was increased from 100 to 800 horses, but in vain, and an enterprise that had cost £175,000 was apparently at an end for ever. Thereupon the entrances to the tunnel were closed, and the ground above them levelled, an operation so effectually performed that a long search has been necessary to rediscover them. Now the tunnel is, after all, to fulfil the purpose for which it was designed, but the motive power is to be electricity instead of compressed air. Trains each of four or five long, low waggons are being constructed. Every car will bear nine tons. The trains are to be capable of travelling at the rate of 30 or even 35 miles an hour, and the tunnel will be passed through in five minutes.

At the closing meeting of the recent Trades Union Congress at Plymouth, Mr. Ben Tillett, of the London Dock and Wharf Labourers' Union, proposed, and Mr. E. C. Gibbs, representing the London house-decorators and painters, seconded, a resolution dealing with the housing problem, demanding drastic solution, and calling upon all municipal bodies to avail themselves of the powers conferred upon them in Part 3 of the Housing of the Working Classes Act, 1890, by the erection of municipal dwellings to be let at a rental covering the capital and interest on the buildings only, the limit for repayment of the loan to be 100 years; and, further, the establishment of a rents court for dwelling-houses upon similar lines to the Land and Rents Court of Ireland and the Highlands of Scotland. The resolution was carried unanimously, as also was one instructing the Parliamentary Committee to bring before the Government the pressing need for a better and cheaper service of workmen's trains on all railways.

Mr. Andrew Carnegie is the newest addition to New York's colony of millionaires. His house on Upper Fifth Avenue is to be in a late phase of the Renaissance, with Dutch-Colonial details. The architects, Messrs. Babb, Cook, and Willard, have, says the *Art Decorator* of New York, consistently abstained from doing anything startling or showy, and their work has always been marked by a quiet, good taste, which, it seems, is at length being appreciated. A feature new to New York will be the garden, which, with the house, will occupy the entire width of the block, between Ninetieth and Ninety-first Streets. The principal entrance will be in the latter street. On the ground floor will be a large hall, the dining-room, breakfast-room, tea-room, library, drawing-room, billiard-room, and conservatory. The garden will be terraced and laid out in flower-beds in the Old French style, as is shown in the engravings to Abraham Bosse's "Le Jardin de la Noblesse Françàis."

The annual conference of the Institute of Auctioneers was held in Dublin on Thursday and Friday last. The first day's proceedings were concluded by a dinner to the Council of the Institute, at which the Lord Mayor was present. At the general meeting on Friday, Mr. W. R. Peck, the president, occupied the chair, and Mr. Weatherall presented illuminated addresses to Mr. J. F. Field, F.S.A., and Mr. Alderman Edward Dobson, the past presidents, for their services in organising and establishing the Institute. An earnest appeal was made to auctioneers practising in Ireland to join the Institute as members.

An unusual accident occurred at Chicago on Monday week at the Coliseum in course of erection there, involving the loss of ten lives, and the maiming of about the same number of workmen. In this case the last of twelve steel arches had been erected under the charge of the contractors, the Pittsburgh Bridge Company, and the general approval of Mr. Shankland, who had had great experience during the World's Fair operations, when through some unascertained cause it lost its balance through some yielding to a strain and fell against its neighbour, and one after another the entire series of trusses fell in ruins. Another extraordinary failure is recorded in the same issue of the Chicago journals, that of one of the bridges over the Chicago River, which fell in halves as it swung open—a mischance which caused the immediate official closing of three other bridges, after examination had disclosed that they were in a perilously unsafe condition.

The improvement of Delaware Avenue, Philadelphia, and the extension of the city piers has been continued during 1898. The avenue is being widened from about 50ft. to 150ft., involving the reclaiming from the river of a strip about 100ft. wide, the depth of water varying from 4ft. to 20ft., beneath which is soft mud from 10ft. to 40ft. deep. Intercepting sewers are necessary to discharge the dry weather sewage at the pier head and allow the storm-water to discharge into the docks as heretofore. The bulkhead is constructed partly as a concrete wall on a timber and pile platform backed by sheet piling and braced with spur piles, and partly of concrete blocks laid on a bank of coarse gravel, with its outer slope faced with riprap. Piles are driven through the gravel and sawed off about 12ft. below low water. Concrete blocks are placed on the piles below low water and an even bearing obtained by a cement mattress, as introduced years ago at New York by Mr. George S. Greene, jun. The work is being done by the Bureau of Surveys of the Department of Public Works, of which Mr. George S. Webster is chief engineer; Mr. J. A. Bensel, of the New York Dock Department, is consulting engineer.

Wood-flour is made by grinding sawdust to a fine powder, and is used throughout the United States and in Germany for two general purposes—first, in the manufacture of dynamite and nitro-glycerine; and second, in the manufacture of linoleum and papyrolite, or artificial flooring. The wood-flour is used as a cheap substitute for infusorial earth, which is the standard material for dynamite manufacturers. It is regarded as distinctly inferior to infusorial earth for making explosives, and it is only used where a cheap product is desired, or where the infusorial earth cannot be obtained. Wood-flour has also been somewhat extensively used in the manufacture of linoleum. The floorcloth is made by laying a coating of hardened linseed-oil mixed with ground cork on a canvas net or back; but here again it was found to be hard and inelastic, and for that purpose inferior to cork meal, so that its use has been abandoned to a great extent. Papyrolite is extensively used as a flooring for kitchens, halls, corridors, &c., and is also used on German war-vessels, because it has most of the advantages of wood, it does not splinter from shot, or take fire.

Brick pavements aggregating 1,688 miles in length were laid in Columbus, Ohio, during 1898. In his annual report, Chief Engineer Mr. Julian Griggs, of the Department of Public Improvements, remarks that the practice of determining the character of the brick offered for street pavements by submitting samples to the standard rattling test adopted by the National Brick Makers' Association has been continued, and has tended to improve the quality of brick used for paving purposes. The recommendation of a year ago for the use of concrete foundation in street improvements instead of broken stone has not found any response in a change of practice; in the mean time a very good object lesson on the wisdom of such change can be seen in the pavement of Fifth Avenue, which has gone to pieces, and the brick, broken stone, and mud are becoming hopelessly mixed.

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MEETINGS FOR THE ENSUING WEEK.

SATURDAY, SEPT. 23.—Northern Architectural Association. Visit to Sunderland.

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THE ARCHITECTURAL ASSOCIATION.

The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, at 6.30 p.m., and the STUDIO OPENS on TUESDAY, October 10th, at 6.30 p.m.

A Pamphlet, giving full information, and nomination forms for Membership, may be obtained on application to the SECRETARY, No. 56, Great Marlborough-street, W.

G. B. CARVILL
R. S. BALFOUR } Hon. Secs.

The Society of Architects.

Founded 1884. Incorporated 1893.

ST. JAMES'S HALL, PICCADILLY, W.

An EXAMINATION in ARCHITECTURE and BUILDING CONSTRUCTION, &c., will be held on the 11th, 12th, and 13th of OCTOBER, 1899.

Gold, Silver, and Bronze Medals are awarded under certain conditions.

The latest date for entering is SEPTEMBER 20th, 1899.

Syllabus free. Copies of last Examination Papers, 1s.

C. McARTHUR BUTLER, Secretary.

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CHIPS.

The Countess Powis cut on Tuesday the first sod of a light railway to connect Oswestry with the Tanat Valley, one of the prettiest of the Cambrian valleys. The line serves eighteen miles of fertile agricultural country, and will also tap extensive slate quarries and rich lead mines at Llangynog.

The city asylum at Norwich is about to be enlarged at an estimated cost of £6,800.

Pembroke-street Baptist Chapel, Plymouth, was reopened on Wednesday, on the completion of alterations and improvements effected at a cost of £900.

The coffin of the late Queen of Denmark is at present deposited in the chapel of Frederick V. in the Roskilde Cathedral, near Copenhagen. It is presently to be placed within a sarcophagus, executed by Herr Brandstrup, the eminent Danish sculptor. King George has sent a block of marble from Greece, which is to form the bed of the sarcophagus, which will itself be constructed of marble brought from Italy by Herr Brandstrup.

The Commercial Rooms at Bristol have been reopened after internal renovation and decoration, works carried out by Messrs. Edkins and Sons, of the same city.

A Presbyterian church erected at the corner of Mansfield-road and Villa-road, Nottingham, at a cost of £6,300, was opened on Sunday. The church, the architects of which are Messrs. Brewill and Baily, of Angel-row, Nottingham, Mr. T. Cuthbert being the builder, is in the Late Perpendicular style. The exterior is of Coxbench stone, with hammer-dressed facings of Hollington stone, and the interior of Bath stone, the open timber roof being covered with green slating, stained on the inside with bronze-green. The church consists of a nave and two aisles, with a small gallery at the west end, and provides seating accommodation for 520 persons.

At the meeting, on Monday, of the Shrewsbury Town Council, a lengthy report which had been received from Messrs. Taylor, Sons, and Santo Crimp, of Westminster, in reference to the different available sources of water supply, was referred to the water committee to consider and report upon. The scheme which seemed most to recommend itself to the council was the Batchcot Upland scheme, the cost of which was set down at £170,000, but the price for the land necessary for a water-shed was not included.

The city council of Leeds agreed at their last meeting to continue the bacterial treatment of sewage at Knostrop, and afterwards granted an additional £5,000 for the carrying on of the work. It was decided to apply for powers to borrow £200,000 for hospital purposes, £150,000 for the carrying out of the insanitary area schemes, and £20,000 for cemetery purposes. The sanitary committee was authorised to accept tenders for the erection of a smallpox hospital at Killingbeck at a cost of £62,000.

Trade News.

WAGES MOVEMENTS.

BIRMINGHAM CABINET MAKERS AND THEIR WORK.—The members of the Amalgamated Union and Alliance Cabinet Association (Birmingham District) held a meeting on Monday night in the People's Hall, in reference to their negotiations with the masters' association. Mr. P. Martin (Alliance Cabinet-makers' Association) presided, and there was a large attendance. Mr. J. O'Grady (trade organiser) reported on the result of a recent conference between the masters' association and the men's representatives. The minimum rate of wages was increased from 8d. to 8½d. per hour, and the joiners' minimum rate of wages (9½d. per hour) was agreed upon for work upon bank, bar, and shop fittings. The men had also obtained the general extra payment for overtime and working-out expenses. The masters further agreed that the code of working rules adopted should not be altered until three months' notice had been given on either side. A standing joint committee of masters and men was appointed for the consideration of grievances, with a view to obviating strikes and lock-outs. The conditions of settlement were agreed to. An address on organisation and trade matters was delivered by Mr. F. Smith, general secretary of the Amalgamated Association.

SCOTTISH PLASTERERS' FEDERAL UNION.—The Scottish National Operative Plasterers' Federal Union held their fifteenth conference in the George Hotel, Kirkcaldy, on Saturday. Brother Inglis Scott, Kirkcaldy, who occupied the chair, remarked that locally their trade was very good, and had been so for some time. The relations between employers and employés were at present amicable, and although they had had some little difficulties, especially in connection with the adoption of the by-laws, these had all been overcome. The standard rate of wages was higher than ever before. He was pleased to learn from the reports that there was every prospect of a busy season all over Scotland.

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Mr. Edward Gentle, of London, has offered to present to the town of Spalding a collection of a hundred pictures, which are to find a home in Ayscoughfee Hall, Spalding's Diamond Jubilee Memorial. The Ayscoughfee Committee, to whom the offer was made, have accepted it.

The Royal Convalescent Home at Bristol will be opened by the Queen on Friday, November 17th.

The Board of Trade have confirmed an Order authorising the construction of a light railway in the county of Montgomery, between Welshpool and Llanfair Caereinion; also Orders authorising the construction of light railways in the county of Essex, in and near to the borough of Southend-on-Sea; and authorising the construction of a light railway in the county of Aberdeen, between Fraserburgh and St. Combs.

Mr. Henry T. Hare has been appointed architect for the technical institute about to be erected at Tunbridge Wells. The outlay will be about £9,000, and the building will form part of a larger scheme for a town-hall and free library.

At the last meeting of the town council of Bournemouth a letter was read from Mr. Hankinson, offering, on behalf of Miss Durant, to give a clock-tower to be placed on the site of the present electric light column in the Square. It is proposed to build it of Bath stone to a height of 70ft., with four transparent faces, for lighting at night. The offer was accepted subject to the approval of the plan and design.

Mr. C. J. Fox Allin, surveyor to the urban district council of Smethwick, has issued his annual report for the year ending March 31 last. It states that during the year plans were submitted and approved for the erection of 1,162 houses, and 694 houses were completed during the same period.

The markets committee of the city council of Bath have decided that the surveyor of works, Major Davis, shall prepare plans for the re-construction of the markets, so as to make them more attractive and remunerative.

The Black Bull in the High-street of Dartford, one of the few remaining examples of the 18th-century coaching inns, is about to be demolished and rebuilt on modern lines.

Niagara Falls are to be illuminated by electricity during the coming Buffalo Exposition. The idea is to erect a series of tall poles on both the American and Canadian sides of the river. On top of them will be placed search-lights, and the colours of the lights which are thrown on the Falls will be constantly changed. Arc lights will also be placed in the Cave of the Winds, which will give to the water which falls in front of it a phosphorescent effect. The current is to be obtained from the Falls themselves.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	"	7 0 0
Wrought-Iron Girder Plates	5 15 0	"	6 10 0
Bar Iron, good Staffs	8 0 0	"	9 0 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	"	17 5 0
Do., Welsh	5 15 0	"	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	"	8 5 0
Best Snedshill	10 0 0	"	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£7 0 0	to	£8 0 0
Cast-Iron Stanchions	7 0 0	"	8 0 0
Rolled-Iron Fencing Wire	8 5 0	"	9 5 0
Rolled-Steel Fencing Wire	8 5 0	"	9 5 0
" " " Galvanised	11 10 0	"	12 10 0
Cast-Iron Sash Weights	5 5 0	"	5 10 0
Cut Clasp Nails, 3in. to 6in.	9 0 0	"	10 0 0
Cut Floor Brads	8 15 0	"	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 12 6	to	£6 17 6
4in. to 6in.	6 12 6	"	6 17 6
7in. to 24in. (all sizes)	6 12 6	"	6 17 6

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	67½p.c.
Water-Tubes	62½
Steam-Tubes	55
Galvanised Gas-Tubes	52½
Galvanised Water-Tubes	47½
Galvanised Steam-Tubes	40

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	"	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 15 0	"	17 15 0
Pig Lead, in 1cwt. pigs	16 0 0	"	17 0 0
Lead Shot, in 28lb. bags	19 12 6	"	20 12 6
Copper Sheets, sheathing and rods	93 0 0	"	94 0 0
Copper, British Cake and Ingot	79 0 0	"	80 0 0
Tin, Straits	145 0 0	"	146 0 0
Do., English Ingots	148 0 0	"	149 0 0
Spelter, Silesian	22 15 0	"	23 0 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
" Bangkok	"	11 5 0	"	15 5 0
Quebec Pine, yellow	"	5 0 0	"	6 5 0
" Oak	"	4 2 6	"	6 15 0
" Birch	"	2 12 6	"	4 10 0
" Elm	"	4 12 6	"	5 5 0
" Ash	"	3 15 0	"	4 15 0
Dantsic and Memel Oak	"	3 0 0	"	4 0 0
Fir	"	2 5 0	"	3 5 0
Wainscot, Riga p. log	"	3 2 6	"	5 10 6
Lath, Dantsic, p.f.	"	4 10 0	"	5 10 0
St. Petersburg	"	4 0 0	"	6 10 0
Greenheart	"	7 15 0	"	8 0 0
Box	"	7 0 0	"	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	"	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	"	0 0 7½
" Honduras	"	0 0 4½	"	0 0 6
" Mexican	"	0 0 3½	"	0 0 4
" African	"	0 0 3¾	"	0 0 5
Cedar, Cuba	"	0 0 4	"	0 0 4½
" Honduras	"	0 0 3½	"	0 0 3½
Satinwood	"	0 0 10	"	0 1 9
Walnut, Italian	"	0 0 3	"	0 0 7½
" American	"	0 2 3	"	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 15 0	to	£27 5 0
" 2nd	15 15 0	"	18 10 0
" 3rd	9 15 0	"	11 5 0
Canada Spruce, 1st	9 0 0	"	11 0 0
" 2nd and 3rd	7 10 0	"	8 10 0
New Brunswick	7 10 0	"	8 5 0
Riga	8 5 0	"	9 5 0
St. Petersburg	10 0 0	"	12 0 0
Swedish	9 15 0	"	10 15 0
Finland	9 10 0	"	10 10 0
White Sea	11 15 0	"	18 5 0
Battens, all sorts	5 0 0	"	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 11 6	"	£0 15 6
2nd ditto	0 7 0	"	0 11 3
Other qualities	0 5 3	"	0 8 9
Staves, per standard M:—			
U.S. ditto	£35 0 0	"	£42 10 0
Memel, cr. pipe	210 0 0	"	220 0 0
Memel, brack	180 0 0	"	190 0 0

OILS.

Linseed	per tun	£20 10 0	to	£20 15 0
Rapeseed, English pale	"	24 5 0	"	24 10 0
Do., brown	"	22 0 0	"	23 0 0
Cottonseed, refined	"	19 0 0	"	20 0 0
Olive, Spanish	"	32 0 0	"	32 10 0
Seal, pale	"	18 10 0	"	19 0 0
Cocoanut, Cochin	"	28 15 0	"	29 5 0
Do., Ceylon	"	25 0 0	"	25 5 0
Palm, Lagos	"	24 5 0	"	24 15 0
Oleine	"	18 15 0	"	19 15 0
Lubricating U.S.	per gal.	0 6 8	"	0 7 6
Petroleum, refined	"	0 0 6½	"	0 0 6½
Tar, Stockholm	per barrel	1 6 6	"	1 6 6
Do., Archangel	"	0 19 0	"	1 0 0
Turpentine, American	per tun	32 10 0	"	33 0 0

LIST OF COMPETITIONS OPEN.

Norwich—Bank, Red Lion-street (Local Competition)	50gs., 20gs., 10gs.	James Fairbairn, Secretary, C.E.Y.M.S. Rooms, Norwich	Sept. 16
Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	„ 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	„ 30
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	Oct. 17
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Leeds—Masonic Hall, Great George-street (Assessor)	£50, £20, £10	Chas. Craven, Sec. Masonic Hall Co., 90, Albion-street, Leeds	—
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—

LIST OF TENDERS OPEN.

BUILDINGS.

Brentwood—Additions to Essex Lunatic Asylum		Widnell and Trollope, 20, Tothill-street, Westminster, S.W.	Sept. 16
Sligo—Alterations in the Chapel of Workhouse	Guardians	W. F. Gilcriest, M.I.C.E., Wine-street, Sligo	„ 16
Whitwood—Additions to Caretaker's House	Urban District Council	Arthur Hartley, Consulting Surveyor, Carlton Chambers, Castleford	„ 16
Cluny—Additions to Offices on Knockfullertree Farm		Ranald Macdonald, Cluny Estates Office, Union-terrace, Aberdeen	„ 16
Thornhill, Masborough—Infants' School	Rotherham (U.D.) School Board	J. E. Knight, Architect, 33, College-street, Rotherham	„ 16
Tipton—Shedding and Boundary Wall, Workhouse-lane	Urban District Council	Wm. H. Jukes, Surveyor, Public Offices, Tipton	„ 16
Cluny—Additions to Upper Banteith		Ranald Macdonald, Cluny Estates Office, Union-terrace, Aberdeen	„ 16
Sligo—Works at Hospital and Nuns' Residence	Guardians	W. F. Gilcriest, M.I.C.E., Wine-street, Sligo	„ 16
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	„ 18
Carlisle—New Vicarage, Irthington		T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	„ 18
Normanton—Enlarging Board Schools	School Board	William Watson, Architect, Barstow-square, Wakefield	„ 18
Cushnie—Dwelling-House at Nether Minmore		Andrew Hogg, Ground Officer, Cushnie, Alford, Scotland	„ 18
Preston—Public Abattoir at Cattle Market	Corporation	The Borough Surveyor, Town Hall, Preston	„ 18
Bradford—Enlarging Tyersal School	School Board	E. P. Peterson, F.S.A., Architect, 48, Sunbridge-road, Bradford	„ 18
Skipton—Enlargement of Craven Bank		John Varley, C.E., and Son, Architects, Skipton	„ 18
Hunslet—Restoration of Factory, Whitehouse-street	W. Wilson and Sons	G. F. Bowman, Architect, 5, Greek-street, Leeds	„ 18
Cambridge—Additional Buildings at the Sanatorium, Mill-road	Public Health Committee	MacAlister and Tench, Architects, 20, St. Andrew's-st., Cambridge	„ 18
Drighlington—Five Scullery-houses		The Co-operative Society's Office, Drighlington, Yorks	„ 18
Pontypool—Repair and Sanitary Work at the House, Park-terr.	Trevethin School Board	Henry Bythway, Clerk, Pontypool	„ 18
Craigellachie, N.B.—Two Blocks of Houses	Building Co., Limited	A. and W. Reid and Wittet, Architects, Elgin	„ 18
Hunwick—Institute		F. H. Livesey, Architect, Newgate-street, Bishop Auckland	„ 18
Gwennap—Additions to St. Day Schools	School Board	S. Hill, Architect, Redruth	„ 18
Muirkirk—Cemetery Works	Parish Council	Allan Stevenson, 14, Cathcart-street, Ayr	„ 18
Carlisle—House, Stables, and Outbuildings	Walter Wood	James Leslie, Architect, 71, Broad-street, Carlisle	„ 19
Leeds—Movable Wood Floor at Cookridge-street Baths		The City Engineer's Office, Municipal Buildings, Leeds	„ 19
Didsbury—Police Station	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	„ 19
Tow Law—Business Premises	Industrial & Provident Society, Ltd.	The Stores, Tow Law, Durham	„ 19
Littlestones, Kent—Coastguard Buildings	Admiralty	The Coastguard Station, Littlestones, Kent	„ 19
Northfield—Boiler-House at Shenley Fields	King's Norton Union Guardians	Edwin Docker, Clerk, Cottage Homes, Northfield	„ 19
Ashton-under-Lyne—Sycamore Hotel, Cockbrook		T. D. Lindley, Architect, Market-avenue, Ashton-under-Lyne	„ 20
Manchester—Alterations at Leaf-street Baths	Baths Committee	The City Surveyor, Town Hall, Manchester	„ 20
Hove—Alterations to Lodge at Cemetery		The Borough Surveyor's Office, Town Hall, Hove	„ 20
Silloth—House and Shop	D. Over	Geo. Armstrong, Architect, 24, Bank-street, Carlisle	„ 20
Ashton-under-Lyne—Business Premises, Stamford-street	G. Harrison and Sons	T. D. Lindley, Architect, Market-avenue, Ashton-under-Lyne	„ 20
Long Melford—Fireproof Strong Room		Fisher and Steed, Solicitors, Long Melford, Suffolk	„ 20
Cambridge—Enlargement of Council-Chamber	Town Council	The Borough Engineer's Office, Guildhall, Cambridge	„ 21
London—Offices, &c., Star Wharf, King's-road	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	„ 21
Pentre—Additions to Cwmclydach Board School	Ystradyfodwg School Board	Jacob Rees, Architect, Hillside Cottage, Pentre	„ 21
Carlisle—Fitting Shop, &c.	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	„ 21
Cloughglass—Three Cottages	Robt. Corscaden	R. Eccles Buchanan, Architect, Londonderry	„ 21
Basford—Timber Goods Shed	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	„ 21
Winchester—Additions to Laundry Block at Workhouse	Guardians	Cancellor and Hill, Architects, Winchester	„ 22
Dunmow—Horse-Boxes at Barnston Hall Farm, Barnston		Wade, Wix, and Wade, Architects, Dunmow	„ 23
Pontypridd—Workhouse and Boundary Walls at Llwynypia	Guardians	E. C. Spickett, Clerk, Pontypridd	„ 23
Wickeridge—New Wing to House		G. E. Allen, Wickeridge, near Ashburton	„ 23
Tudhoe—Repointing House at East Howle Board School	School Board	Sam Adams, Clerk, 56, North Bondgate, Bishop Auckland	„ 23
Clones—Schools		T. Elliott, Architect, 38, Darling-street, Enniskillen	„ 25
Consett—Four Houses, Belle Vue-terrace		Robt. Robson, Front-street, Leadgate	„ 25
Ballyshannon—Repairs to Church	Rev. J. Baillie	T. Elliott, Architect, 37, Darling-street, Enniskillen	„ 25
Scarborough—House at Scalby		J. Caleb Petch, Architect, Bank Chambers, Scarborough	„ 25
Leek—Galvanised-Iron Shed	Urban District Council	John Myatt, Town Surveyor, Town Hall, Leek, Staffs	„ 25
Halifax—Workshops, Shay-lane, Holmfield		F. Fielden, Architect, 7, Fountain-street, Halifax	„ 25
South Shields—Additions to Westoe-road Board School	School Board	Fred. Rennoldson, Architect, 37, King-street, South Shields	„ 26
Walthamstow—New Out-Offices at Gamuel-road Schools	School Board	W. A. Longmore, F.R.I.B.A., Hoe-street, Walthamstow	„ 26
Cork—Offices, &c., Kemp-street	Lunham Bros., Ltd.	Robert Walker and Son, Architects, 17, South Mall, Cork	„ 26
Paddington, W.—Alterations to Woodfield House, Woodfield-rd.	Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	„ 27
Staines—Infant School, Stanwell-road	School Board	Murray & Dibdin, Architects, 5, Hurstbourne-rd., Forest Hill S.E.	„ 28
Chopwell—Houses in Flats	Robert Armstrong	Badenoch and Bruce, Architects, 55, Pilgrim-st., Newcastle-on-Tyne	„ 28
Salford—Encaustic Tiling at Town Hall		The Borough Engineer's Office, Town Hall, Salford	„ 28
Hereford—Renovations at Sergeant's Cottage	Standing Joint Committee	Alfred Dryland, County Surveyor, Hereford	„ 29
Margate—Coastguard Buildings	Admiralty	Director of Works Dept., Admiralty, 21, Northumberland-av., W.C.	„ 29
Arundel—Billiard-rooms &c., at the Victoria Institute		Wheeler and Lodge, Architects, Horsham	„ 30
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	„ 30
Cymmau—Alterations at C.M. Chapel		William Lewis, Cymmau, Wales	Oct. 1
Erith, Kent—Central Schools (1,260), West-street	School Board	W. Egerton, Architect, 12, Queen's-road, Erith, Kent	„ 2
Hastings—Stabling, Loose Boxes, &c., at Rock-a-Nore	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	„ 2
Sowerby Bridge—Nine Houses		Medley Hall, Architect, 29, Northgate, Halifax	„ 2
Handsworth, Staffs—Stabling, &c.	Urban District Council	E. Kenworthy, A.M.I.C.E., Council House, Handsworth, Staffs	„ 2
Basingstoke—Fifteen Cottages, Flaxfield-road	Working Classes Committee	George Fitton, Borough Surveyor, Town Hall, Basingstoke	„ 3
Lewes—Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	„ 8
West Kensington—Post-Office Savings Bank	H.M. Commissioners of Works	J. Tanner, H.M. Office of Works, Storey's Gate, S.W.	„ 10
Tooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	„ 11
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	„ 12
Isleworth—New Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	„ 18
Brentford—Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	„ 18
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Selby—Alteration of Premises	Yorkshire Banking Co., Ltd.	James Young and Co., Architects, 62, Market-street, Bradford	—
Leeds—Alterations to General Infirmary		Walter A. Hobson, Architect, 82, Albion-street, Leeds	—
Dewsbury—Restoration of Schools	School Board	F. W. Ridgway, F.R.I.B.A., Borough Chambers, Dewsbury	—
New Tupton—Church Institute, Sunday-School, and House		Ernest Oxley, M.S.A., Architect, Clay Cross	—
Chepstow—Rebuilding 29, High-street	C. Curtis	W. Robinson, Architect, King-street, Hereford	—
Tooting, S.W.—Flats		J. Theobald, Architect, 26, Budge-row, Cannon-street, E.C.	—
Morecambe—Altering House into Business Premises	Lancaster and Skerton Co-op. Soc.	Marshall Bros., Architect, Back-crescent, Morecambe	—
East Kirkby—Extension to Co-operative Premises		Lawrence Bright, Architect, 9, St. Peter's Church-walk, Nottingham	—
Cainscross—Extensions to Bakehouse	Cainscross and Ebley Co.-op. Soc.	The Society's Office, Cainscross, Glos.	—
Newport, Mon.—Schools		F. R. Kempson, F.R.I.B.A., 16, High-street, Cardiff	—
Great Bentley—Four Cottages at Holly Bush Hill Brickworks	J. Girling	J. W. Start, F.S.I., Architect, Colchester	—
Bradford—Six Houses and Shop		James Young and Co., Architects, 62, Market-street, Bradford	—
Nottingham—Additions to Workhouse, Beech-avenue		A. H. Goodall, Architect, 14, Market-street, Nottingham	—
Watford—New Offices and Warehouse	Benskin's Watford Brewery, Ltd.	Chas. P. Ayres, Architect, 14A, High-street, Watford	—
Bradford—Offices, &c., at Globe Foundry, Whetley Hill		F. Moore, Architect, 40, Sunbridge-road, Bradford	—
Tuxford—Fifteen Houses		Flockton, Gibbs, and Flockton, 15, St. James's-row, Sheffield	—
Killinghall—Cottage	Miss Powell	Bland and Bown, Architects, North Park-road, Harrogate	—
Barwell—Wesleyan Chapel and Schools		A. E. Sawday, Architect, 4, Market-street, Leicester	—
Usworth, Durham—Forty Houses, Douglas-terrace		Little and Browne, Architects, Mossley-street, Newcastle	—
Consett—Two Engine Houses	Consett Iron Company, Ltd.	The Engineer's Office, Consett, Durham	—
Bramley—Two Shops and Nine Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Stalybridge—Branch Bank		John Eaton, Sons, and Cantrell, Architects, Ashton-under-Lyne	—
Fornham, Suffolk—Kiln and Malt Store at Malting	Lady Cullum's Trustees	Ernest Pritchett, Hardwick Estate Office, Bury St. Edmunds	—
Wallsend—Branch Premises		The Industrial Co-operative Society, Ltd., Wallsend	—
Tunbridge Wells—Parish Room and Institute, St. John's		H. H. & E. Cronk, Archts., Mount Ephraim-rd., Tunbridge Wells.	—

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WANTED, A METHOD OF TEACHING.

"WHAT should an architect learn?" is the question that is frequently asked by the novice who has entered the profession with no other intention than that of making a living by it. It is a genteel profession, and that is sufficient; he knows nothing of it, but thinks that by asking he can acquire all that is necessary, and that there is no other trouble or difficulty about it. To such persons there is a "royal road" to every pursuit. The editor of the professional journal gets plenty of these sorts of questions from all kinds and conditions of men, as if he could give in each case an answer that could be profitably followed. The more important question "How he should learn?" which should have preceded the first, is not even thought of: it is not so apparent to the class of minds we are considering here, who wish for an expeditious and easy method that will give them little trouble to think out for themselves. It would be easy if our space allowed to give a few practical examples of these inquiries. We may just take one of a general kind that is very often made to us. One young man says he will soon complete his articles in a provincial practitioner's office, and he wants to know what course he ought to take. He has studied at a local school of art, he may even hold the Honours Building Construction Certificate; in addition to these credentials of his ability and perseverance, he has won a bronze or, perhaps, silver medal for drawing, and he has made measured drawings of old work. His present office work is too commonplace and restricted to suit him; he complains that his master is more of a surveyor than an architect, and he asks how he can obtain a better situation. He thinks it necessary that he should come to London: there is a wider scope for his taste, the educational facilities, classes, and Association studio attract him. In short, he wants to gain experience; but he asks "What kind of situation should I apply for?" Another querist wants to know what he is to learn; he is a pupil in a country office, has passed the Intermediate Exam. of the R.I.B.A., has been occupying his time in making coloured drawings, &c. A third asks as to what books he should obtain to learn the practical part of the business. Others, again, with a total ignorance of their profession or practical business, and a disregard of common sense, ask how they can obtain a situation as a borough engineer, or what requirements are necessary to fill some public appointment. The latter querists are so childish in their simplicity that it is useless to give any answer that will satisfy their ambitious aim to get at the top of the ladder without climbing. As to the former querist, it is plain that he has embarked in a business he has very little aptitude for, and that his office training, certificates, and diplomas have not done much to enlighten his mind on the main ssues. He has, in short, no direction, and is ike a rudderless boat on a rough sea. What hese novices need most of all is a guide—omeone who can control their studies by howing them how they can be directed to proper channels, or subserve a certain object. The first inquirer says he will soon complete his articles, yet he asks, "What course ught he to pursue?" It is natural to ask, Where is his master? His other credentials—that he has taken certificates and passed examinations — ought, one would have thought, to have made him independent of such advice; but not so. He has acquired a proficiency in draughtsmanship and the elements of art, and yet he is seeking guidance. We may cite many other cases where the brain has been crammed with irrelevant knowledge, but the one kind necessary to success has been neglected. These inquiries appear to show there is something wanting in our system of training students for the profession. The fact seems to be the pupil is *led*, but does not follow. He has never been taught to think out for himself in any subject. His mental training is not sufficient; he does not come in contact with the real building or workman as he would have done if the mental and manual training went hand in hand. His head is crammed with facts and ideas, but he has no exercise in their employment. They come before building operations, not after them. He may have plenty of ideas, but he lacks the training necessary to express them. We have all heard of painters who could not paint, and musicians who knew nothing of harmony.

Then each individual student has his own particular bent: one has a quicker perception for constructive problems, or he can plan with ingenuity; another has the mathematical or surveying aptitude; a third is a draughtsman; and the student who asks us a question about what course he should follow may omit to inform us of his particular bent, and, therefore, our reply may not be applicable. The scholastic curriculum is not framed on the differences of individual proclivities and tastes, but is rigid and uniform, and, therefore, in many cases fails to help the student. The craft-study of art is based on individual preferences; one will find it easy to express his ideas in stone, another in metal or in plaster. The student of architecture should try and find out what these materials are and how they can be best utilised for expression.

From the time the architectural pupil emerges from his master's office till he enters upon his professional career, he is in a state of mental confusion as to what his course should be and what he should study. This confusion arises partly from the want of direction or systematic instruction, and partly from a mistaken idea as to what the profession demands. There are scores of young men who enter the profession without any clear idea of its duties and responsibilities; they look upon it as a pleasing individual recreation, without corresponding duties to others quite as interested as themselves in their achievements. The pupil forgets that it is not merely drawing and designing plans and elevations of ideal buildings, but in making himself a competent constructor, to take the responsibility of carrying them out to the satisfaction of other people. This is where the fond hopes of the youthful aspirant are often dashed to the ground; it is a bitter remorse to find that others, often men ignorant of art, have to judge him and take him to task if he commits any blunder, to accuse him of negligence or ignorance if anything goes wrong, to hold him to his own plans and specification. During the term of his pupilage he has little knowledge of all the worries of professional practice. Quite 25 per cent. of the young men who are pupils have made a wrong choice; we can speak with some experience of the many who have discovered their mistake, or have hopelessly "lapsed" into some other occupation after having spent the best years of their life in offices. Many have entered into businesses or gone into trades they knew nothing of, and cared little about, as a bare livelihood; others have gone abroad to seek for openings. This defection could not occur if parents and guardians knew anything of architecture as a profession; or if pupils were instructed at the outset in the duties of the architect and his business. At this juncture of the "would-be" architect the direction should be clear and unmistakable, and the proper authorities are those institutions which open their doors to receive students, and have established courses of instruction, lectures, and hold examinations. We fear this is not the case. There is a rivalry between them, and the chief endeavour is to draw the student to the classes before acquainting themselves with his ability or capacity for the profession. The student is enlisted without being prepared or directed, goes through a prescribed course of subjects, is "coached" for an examination, and is then let loose to make his own way in the profession. Can we be surprised to find him helplessly drifting about, unable to find his feet, wanting to achieve something he has not learned or has no aptitude for, asking for advice in the professional journals about what he is to learn, or where he is to go to pick up the necessary information about a variety of subjects he knows nothing of. The young architect is beset by two opposite classes of instructors, who are both ready to teach him: one of these places art designing first and building afterwards; the other suggests to him that he should take up a craft every evening for an hour or two over some easy piece of work, done without reference to any actual building. This is the ultra-art-craftsman's idea. Both are defective views of architecture. The first is trained in the scientific and commercial methods of the modern profession, in which the designer is considered as the user of a separate faculty, independent of material and technical skill. The building evolved under this system is, as expressed by a certain writer, "a mere setting or framework for a variety of the delicate and beautiful works of men who, without ceasing to be artists, are daily less associated in the vital design of the building. Their work ceases to have those organic relations to the whole which we find in the old work, and even in 18th-century buildings in England." The second class of instructor—the ultra-art-craftsman—inculcates quite an opposite method. He would place the craftsman in the position of the architect, or, if permitted, a body of skilled workmen would take his place and arrange the details of the building without a controlling mind. The building under such a process would be made up of a number of unrelated pieces of craftsmanship, having no unity among themselves. Such an ideal is a little "too advanced" and far-fetched; but both of these views have something in them that is good. The one seems to be the natural reaction from the other. The office and studio view of the profession has led to poverty of thought, and a formal, mechanical kind of practice, or to one entirely given up to "making designs" at 5 per cent. on the estimated cost, and it is against this view of art that the art-craft party has rebelled. They have set up a higher standard of art, though not perhaps quite to the taste of the modern professional representative. With all its exaggeration, the result of enthusiasm, we must claim for this view a patient hearing. We are bound to respect the work of men who have shown by their works that they can realise their ideals, and can produce work that is real art in the truest sense; men who are not ashamed to follow their principles by becoming craftsmen first, learning their art in the only possible way, by a tentative experience with materials and manual skill.

These are principles which the architect and the student cannot afford to neglect. They may affect to despise a course of teaching which makes them condescend to become workmen, to use tools, and labour in workshops and on scaffolds, but it is right that masters who take pupils, and institutions who instruct and examine, should inculcate the value of this practical, or workshop, method of teaching art. The evil is that those who do teach technical art do so in a *dilettante* sort of way; the student is allowed to try his hand over a piece of cut or gauged brickwork, a bit of masonry or ironwork, having no reference to any special building; it is a loose-end piece of work, and he has no conditions to conform to—it takes him an hour or two, and then he can put it by, and forget all about it. This is not the way the Mediæval guildsmen worked, nor the architects of the Renaissance. The training in material and workmanship filled them with ideas. Before they thought of design they mastered the several trades which led up to it, and their work had, so to speak, a sculptural expres-pression and completeness. The craftsmen thought and worked out together the scheme, not separately and in the dissociated way they do now, and their labours were unified by the prevalence of a common object. The modern technical method, on the contrary, encourages a disjointed system. Labour is now organised to such a degree as not to produce the best and the noblest art, but to regulate the rate of wages and to be subservient to contract. Our unequalled building facilities are not utilised as they might be; our materials are converted to save cost—not to produce the best expression; and on this principle the architectural student is taught to become an agent and supervisor of building rather than he real artist in its production.

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ESTIMATES.—XXII.

MACHINE-MADE AND HARDWOOD JOINERY: FITTINGS—IRONMONGER.

SPECIAL fittings for churches and schools, public assembly-rooms are often made of pitch-pine. In pricing these articles the most reliable plan is to obtain quotations from manufacturers of school and church fittings. Church seats with framed backs and bench ends in pitch-pine, vary in price from 5s. to 30s. each. Deal locker desks, 3ft. 4in. long, cost from 14s. to 30s. each. The board school pattern with single seats, 6ft. 8in. long, varnished, is given in Laxton at 39s. each; as an approximate price for fittings of this description, 5s. 6d. to 6s. per foot run may be allowed. Plain deal desks of pitch-pine, 3ft. long, may be put down at 10s. to 12s. each—a large quantity may be priced at a little less; but these are fittings for which it is best to obtain a tender from some well-known maker in the particular trade. Infant gallery desks with top to turn down, slate slots, of pitch-pine varnished, are quoted at 2s. 9d. per foot.

The following are a few items of machine-made joinery:—

SASH-DOORS, FOLDING DOORS, ETC.

105ft. super. 1½in. four-panel doors, the top panels for glass, the lower panels bead-flush and moulded.

These, if machine-made, may be priced at 8½d. per foot super. One maker of joinery prices doors 6ft. 6in. by 2ft. 6in. at 5s. 6d. each.

Ditto ditto. 2in. Lower panels moulded both sides.

Add for extra thickness 2d. per foot.

63ft. super. 2in. ditto, with marginal lights, bead flush and moulded, including shutters.

	£	s.	d.
The price of door would be as above, say	0	0	10½
Add for marginal bars, say	0	0	1½
Add for shutters	0	0	1½
Per foot	0	1	1½

44ft. super. 2in. four-panel doors, with top panels circular-headed both sides, lower panels bolection moulded and bead butt.

	£	s.	d.
Extra labour for circular heads to top panels, say	0	0	3
Extra for bolection moulded and bead flush	0	0	2
Per foot	0	0	5

If we say the doors cost 10½d. per foot, as above, this will give 1s. 3½d. per foot super.

These prices are for machine-made work.

45ft. super. 2in. four-panel folding doors moulded both sides.

The price for machine-made work of this kind is from 10d. to 1s. per foot.

84ft. super. 1½in. ditto moulded both sides.

Price this at 9d. per foot.

Ditto, ditto. Square framed.

7d. per foot will do. A large quantity may be done for less.

30ft. super. 1¼in. dwarf cupboard door, moulded and square, 2ft. 9in. by 1ft. 3in.

These are priced higher than door framing of ordinary size. Machine-made may be got at 5s. 6d. to 6s. per pair. One manufacturer charges for cupboard fronts (four doors) 4½d. per foot super.

18ft. ditto. 3ft. by 1ft. 6in. moulded and square.

Price this at 1s. more, say 6s. 6d. per pair.

28ft. super. 2in. panel outer door and square one side, and bead flush and bolection-moulded the other.

Machine-made doors of this description are priced at 10d. to 10½d.

Ditto 2in. outside doors, one side bolection-moulded, bead flush and moulded the other.

Add to former price for bolection-moulding and moulding, say, 4½d.

Door frames and jamb linings are also machine-made, and sold by the set. Thus 4½in. by 4in. door frame, rebated and twice beaded, can be had for about 11s. per set. This is equal to about 7½d. per foot run. If with fanlight and transom, add 6s.

Jamb linings 6in. by 1¼in., double rebated and beaded, are priced at 6s. 3d. per set. If the stops are nailed on, usual for speculative work, the price is about 4s. per set for inch linings.

56ft. super. 1½in. Venetian sashes and frames, solid mullions, double-hung brass pulleys.

The price of this kind of sash and frame may be put at 6d. a foot more than the ordinary kind.

	£	s.	d.
Common 1½ sashes and frames, &c., say	0	0	8
Add for mullions, &c.	0	0	6
Per foot	0	1	2

Ditto 2in. ditto, ditto with oak sills and moulded sashes.

	£	s.	d.
Add for extra thickness	0	0	2
" " oak sills	0	0	1
" " moulded sashes	0	0	1
	0	0	4

Say 1s. 6d. per foot.

460ft. super. 1½in. framed and rebated greenhouse sashes, braced with oak cross-bar.

These cost about 4½d. per foot super., machine made.

Ditto, ditto, glazed with 16oz. sheet.

Add another 4½d., making 9d. per foot.

No. 1. 1in. deal framed w.c., 1in. seat and riser, lid fitted with brass hinges moulded on edge, 4in. skirting, bearers, &c., 3ft. 6in. wide.

Items may be put down thus:—

	£	s.	d.
Deal-framed top	0	3	0
5ft. 6in. super., 1in. deal seat 2½d.	0	1	1¾
6ft. super., 1in. deal riser	0	1	3
Planing ditto	0	0	11
Cross-tonguing, say, 7ft., ·015	0	0	10½
Moulding edge of seat, 5ft. run, ·012	0	0	6
Skirting, about 8ft. run, 4½ by ¾in.	0	1	4
Flap, mitre-clamped, and frame, at 9d., say	0	2	3
Brass hinges	0	1	0
Labour, cutting and shaping seat	0	2	0
Bearers and fixing	0	2	6
Per set	0	16	9¼

Ditto, of Honduras mahogany, ditto.

We may price this at twice and a-half the above—say, 40s.

In a machine-labour list a fitting of this kind is priced at £1 8s. per set.

No. 1. Honduras mahogany framed top to bath, 7ft. 3in. by 3ft., with moulded edge and shaped perforation, with framed bearers, French-polished.

If we price this at £2 it will be about fair. Say there are—

	£	s.	d.
12ft. super. of 1¼in. mahogany at 2s. 3d.	1	7	0
Moulded edges, say 20ft. run	0	3	4
Bearers and fixing	0	5	0
French polishing, say	0	4	6
Per foot	1	19	10

Deal seats and risers may be priced at 8½d. per foot. If we take three times this as the value of mahogany we get 25½d. equals 2s. 1½d. per foot.

9ft. super. Mahogany 1in. mitre-clamped flap and beaded frame.

If deal clamped flaps and frames can be made at 9d., we may put this down at three times that amount—2s. 3d. per foot super.

4ft. run. Labour to rounded edge to ditto.

Price this at 1½d. per foot run.

10ft. run. 7in. by ¾in. beaded skirting ditto.

Say this is worth 9½d. or 10d. In detail it would be—

	£	s.	d.
7in. super. of ¾in. mahogany	0	0	4
Planing, &c.	0	0	2
Fixing	0	0	1½
Polishing	0	0	[illegible]
	0	0	10½

No. 2. Tongued and mitred angles to ditto.

These may be priced at 4½d. to 5d. each.

No. 2. Rounded ends to ditto.

These ends are simply rounded, and are worth about 3d. each.

GREENHOUSE.

Erect a span greenhouse of best red deal, 20ft. long by 12ft. wide, with 2in. sashes, roof glazed with 21oz. sheet, and upright framing with 16oz. sheet, iron muntins, the lights to open to front, and ridge with lever tackle, the roof to be trussed with iron rods, with gutters, and down pipes, painted four coats, and fixed complete.

This is a difficult item to price without drawings or quantities. The best plan would be to obtain a price of a well-established firm of horticultural builders like Messenger and Co., of Loughborough. For ordinary work, the cost would be from £40 to £45. Messrs. Messenger and Co. supply greenhouses of this description 30ft. long 12ft. wide, for £56; 14ft. wide, £64; 18ft. wide, £75. As a general and approximate rule, it is found that, including foundations, staging, paving &c., greenhouses cost about 5s. per foo super. of area covered. The above-quote prices amount to about 4s. a foot super.

IRONMONGER.

For ironmongery the estimator shoul consult manufacturers' list prices; to thes carriage, profit, and fixing must be added i most cases. The "day work" prices includ profit only. "Measured prices" includ profit, screws, and fixing.

Nails are sold by the M, or thousand, an are weighed, and the prices of some of thes we give. Steel clasp nails are largely use and are a little more than iron ones. Fo the prices of screws, refer to a scre list. These prices are subject to a discou about 50 to 60 per cent. off iron. F large quantities the latter may be tak In specifying and estimating, the thickne of the wood has to be taken into consider tion. There is no rule, but some authorit say the maximum length of screw should twice the thickness of wood. One schedu gives the following:—½in. thickness, 1in. screw is used; for ¾in., 1¼in.; for 1in. thickness, 1¾in. screw; for 1½in., 2¾in. screw; for 2in. thickness, 4in. screw; for 2½in., 4in.; for 3in. thickness, 5in. Brass screws are used for hard woods; 3in. and 4in. butts require 1½in. screws. There is a considerable waste in nails and screws, and to allow for this a percentage of 5 to 7 per cent. may be charged.

It is seldom the lengths of screws or nails are given, and the estimator must make a guess from the thicknesses of material concerned.

Laxton gives the following prices of screws in small quantities per dozen:—

	¾in.	1in.	1¼in.	1½in.	2in.
	s. d.	s. d.	s. d.	s. d.	s. d.
Day account	0 1½	0 2	0 3	0 4	0 5
Measured ,,	0 4	0 5	0 6	0 8	0 9
	2½in.	3in.	3½in.	4in.	6in.
Day account	0 7	0 9	1 0	1 4	1 9
Measured ,,	1 2	1 4	1 9	2 3	3 0

Brass screws are twice the price of iron, and copper screws twice and a half.

Hinges form a large and important class of the Ironmonger's work, and are of various sorts used for a variety of purposes. They are charged at per pair. For pricing hinges, consult the lists of manufacturers, as Young and Marten's catalogue. To some of the chief kinds of hinges we may refer. As articles in ironmongery are produced in large quantities, the labour in producing is comparatively less than in other trades. The material also is small in comparison to labour. Twenty per cent. profit is generally allowed on the prime cost of articles.

The following prices of nails and screws are given in Lockwood's "Builders' Prices":—

For fine-cut joiner's brads, per M:—

⅜in.	½in.	⅝in.	¾in.	1in.	1¼in.	1½in.	2in.
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
0 3	0 3	0 3¾	0 4½	0 5¼	0 7	0 9	0 10½

Per 10 M:—

1 0	1 9	2 3	2 7	3 6	4 6	6 0	6 9

For cut clasp, rose, and clout nails, per cwt.:—

1in.	1¼in.	1½in.	1¾in.	2in.	2½in.	2¾in.	3 to 6in.
21 9	19 6	17 3	16 6	15 9	15 9	15 0	14 3
½cwt.:—							
22 3	20 0	17 9	17 0	16 3	16 3	15 6	14 9
¼cwt.:—							
22 9	20 6	18 3	17 6	16 9	16 9	16 0	15 3

Fine wrought clasp, per cwt.:—

1in.	1¼in.	1½in.	1¾in.	2in.	2½in.	3in.	4in.
90 0	75 0	57 0	49 0	45 6	36 0	34 6	33 0

Strong wrought clout, per cwt.:—

	¾in.	1in.	1¼in.	1½in.	1¾in.	2in.	2½in.
—	64 0	56 0	49 0	42 0	37 6	36 0	34 0
Fine ditto:—							
—	120 0	94 0	75 0	63 0	56 0	49 0	41 0

The most useful nails for the joiner are brads used for laying floor-boards, fixing skirtings, &c. They have blunt points, with top widened to form a head. Clasp nails have sharp points and arrow-shaped heads, and are much used. Clouts have rounded and pointed shanks and flat heads, and are used for fixing ironwork on wood.

Screws are made in great variety for all kinds of work from ½in. to 6in. We only give a few prices per dozen, daywork. Iron screws of 1in. long are priced at 2d. per dozen; 1¼in., 2½d.; 1½in., 3½d.; 2in., 5d.; 2½in., 6d.; 3in., 8d.; 4in., 1s. 2d.; 6in., 2s. 6d. Handrail screws are made 4in. to 6in. long. For ⅜in. diameter, one nut, a 4in. screw is 4d. each, and a 1d. for every ½in. in length up to 6in., which is 7d. If two nuts, add one-sixth. Coach screws per dozen: 2½in. by ⅜in., 10d.; 3½in. by ¾in., 1s. 3d.; 4in. by ½in., 1s. 9d.; 5in. by ⅝in., 3s. 6d.; 6in. by ¾in., 4s.

Bolts and nuts per dozen, daywork, prices are quoted as follows: 1½in. by ¼in., 7½d.; 2in. by ⅜in., 1s.; 3in. by ½in., 1s. 9d. These are with round or square necks, and square nuts, with cup and countersunk heads.

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At Earl Stonham parish church, East Suffolk, a new organ, built by Mr. Guildersleeve, of Bury St. Edmund's, was opened last week,

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XIII.

THE stresses induced upon the various members of the typical central independent girder we have selected, by a uniformly distributed dead load, were ascertained, checked, and tabulated in our last article. It remains now to determine the stresses to which the different parts of the truss are exposed from the action of a moving or live load, which have already been shown to depend upon the position occupied by the rolling load upon the truss. As during the passage of the live load across the bridge this position is continually varying, it will be necessary to consider it equally fully in detail, with respect to each of the apices of the lower flange, as was done with regard to the dead load. A few words must be said here upon the recognised and generally received methods adopted by engineers and bridge designers in dealing with live or rolling loads. First there is the concentrated-load method, which consists in locating the position of the wheel loads of the locomotives—for two are generally used in testing railway bridges—and of the uniform load hauled by them, which produce the greatest stress required upon any separate part of the truss or girder, and then to find, by proper modes of calculation, the actual stress brought upon that part of the truss under analysis for the assumed position of the wheel loads of the engines and train. It is clear that as separate calculations, according to this wheel-concentration system, would have to be made for each member of the truss under the conditions attending every possible position of the rolling load, the time and labour required for the accurate determination of all the stresses would, in the case of a large bridge example, be enormous. It is no wonder, therefore, that so serious a drawback has led to the adoption of several rival methods of investigation and analysis, which have just reasons to be carefully inquired into, as it is claimed for them that while insuring the determination of the same maximum stresses, they are better adapted for the actual exigencies and requirements of each particular case.

One of these methods advocates the employment of a single concentrated load; another that of two similar loads, and a third that of a uniform load of a given amount placed in the centre of the typical train. There is one other which is fast superseding those already mentioned, and that is the method of equivalent uniform loads. This simple system is based upon the assumption that an equivalent uniform load can be found which will produce the same maximum stresses upon all the members of a truss as those to which they are subjected by the wheel-concentration method. Theoretically, this exact equivalence is impossible; but, nevertheless, the coincidence can be made sufficiently near for all practical purposes, and the amount of the substituted system of loading which effects this closely approximate result is termed the equivalent uniform load. It is a very usual practice among English engineers, and to a considerable extent also among their professional brethren in America, to adopt this system, and to estimate the moving load in tons per foot run which would induce the same stresses upon the members of the structure which would be incurred when the heaviest engines and trains constitute the rolling load. The standard or typical train in the United States is made up of a couple of Consolidation or Lehigh locomotives, hauling after them the heaviest train that is ever made up on the line. Those who advocate the wheel concentration method uphold the theoretical conditions above referred to, and maintain that under no conditions of loading will a single uniform load, or, as is more usual, will a number of equal loads placed at the apices or panel points, similarly to the mode of arrangement adopted in our previous articles, accurately represent what really occurs when a pair of locomotives pulling a train after them traverse a bridge. This allegation, while not denied, nor attempted to be refuted by the partisans of the system of the equivalent uniform load, is met by the unquestionably valid assertion that the concentrated load method is, in the first place, unnecessarily tedious and complicated. Secondly, that it is by no means a difficult matter to assume uniformly distributed loads, according to the maximum weight of the rolling stock on any particular railway, which will, with a safe limit or surplus margin, provide for the greatest stresses which are produced by the principle of concentrated loading. It must be borne in mind that whether wheel loads or uniform loads be used, the calculations in both cases will have to be modified from time to time, as the weights of both engines and trains assume ever-increasing dimensions and proportions. During the last ten years the weight of engines and trains has increased very considerably. It is not, as has been frequently erroneously stated, the desire for high speed which has solely dictated the heavy weights of present rolling stock. The cause must also be further searched for in the employment of much heavier gradients, which, both at home, abroad, and in the colonies, incessantly demand larger, more powerful, and consequently heavier engines. In order to point out to our readers the necessity for paying close attention to the gradual but certain augmentation in engines and their accompanying train-loads, the two following tables are given. The first, Table I., was compiled many years ago by Sir Benjamin Baker, Bart., President of the Institute of Civil Engineers, and though ample as the estimate was at the time, it is not now sufficient for the traffic of first-class heavily-engined lines.

Table I.

Span in feet.	Equivalent uniform load per foot run in tons.
10	3·000
20	2·400
30	2·100
60	1·500
100	1·375
150	1·250
200	1·125
300	1·000

The heaviest engines are notably those in use on American railways. Those of the Consolidation pattern weigh 101 tons; but this figure, high as it is, is beaten by the locomotives of the Lehigh heavy-grade type, which run up to 116 and 120 tons. Professor Waddel has prepared the following Table II. of the equivalent uniformly-distributed moving loads which produce the same stresses in plate girders as are due to the wheel-concentration method.

Table II.

Span in feet.	Equivalent distributed load in tons per foot run.	Span in feet.	Equivalent distributed load in tons.	Span in feet.	Equivalent distributed load in tons per foot run.
15·00	2·57	35	1·93	60	1·63
20·00	2·25	40	1·86	70	1·56
22·50	2·23	45	1·78	80	1·50
25·00	2·14	50	1·72	90	1·48
30·00	2·04	55	1·66	100	1·44

Some engineers make a distinction between the equivalent uniform load per foot run for plate and for trusses and open-web girders. That the difference is very small will be seen on comparing the respective rates of loading for the types of girders having a span of 100ft. each in Tables II. and III., which show a very slight increase in favour of the open-web type of bridge. The actual figures are as 1·44 to 1·48, or a difference of only 0·04 ton. This difference will show a larger proportion as the span of the girders is augmented; but in any case it may be either neglected, or the larger allowance taken for the plate girder. There is another reason for treating the difference as a negligible quantity, and that is, that as plate girders are not constructed with spans much exceeding a couple of hundred feet, all comparison between them and trussed structures ceases at that limit.

Table III.

Span of Truss in feet.	Equivalent distributed load in tons.
100	1·48
150	1·43
200	1·40
250	1·38
300	1·33

With regard to these three Tables, there is one point deserving of especial notice which perhaps may call for a little explanation. A reference to the equivalent loads will indicate that the rate of loading per foot run diminishes as the span of the bridge increases. How is this apparent paradox to be accounted for? In the first place, it is evident that the impactive force of a moving load produces a far greater shock upon a small and light bridge than it will do upon a larger and heavier structure. Consequently, so far as resistance to this particular description of stress is concerned, the greater the insistent weight of the bridge itself the better. It is the principle of the hammer and the anvil. So much impressed were engineers in the early days of railways of this fact that an extra thickness of ballast was purposely piled upon the bridges, in order to render them better able to withstand the shock produced by the driving wheels of the locomotive. It follows from this argument that the effect of a moving load upon a bridge varies inversely as the ratio between the weight of the bridge and that of the load. Considering the case of increasing the weight of a bridge by the addition of an extra amount of ballast as one extreme, the other will be found in an example in which the weight of the structure itself is so disproportionately large to that of the moving load, that the impactive action of the latter may be almost wholly neglected.

It has been found, by comparing the results of the stresses obtained by using the two methods of wheel-concentration and equivalent uniform load, that the maximum error incurred by the employment of the latter does not exceed 2 per cent. upon the unsafe side, while it frequently rises to 4 per cent. upon the safe side. From these data it is abundantly apparent that the system of equivalent uniformly-distributed loads may be adopted with perfect security and certainty with respect to the amount of the stresses upon the members of a truss so ascertained. It will be as well to give the general formula from which the equivalent uniform loads may be calculated by assigning such values to it as will give the resulting equations for each particular case. Let L in Fig. 1 represent the span of any beam or girder, *cc* the centre line, and let it be required to ascertain the bending moment at any point, X, which divides the whole span into the separate segments *a* and *b*. Put B M equal to the bending moment at the point X, then making W = the equivalent load per unit of length, in this case per foot run, we obtain—

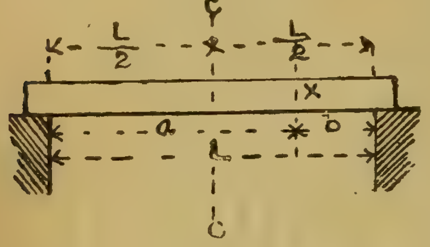


FIG. 1.

$$\text{B M} = \frac{\text{W} \times (a \times b) \times \text{L}}{2 \times \text{L}} \;\ldots\ldots\ldots\; (1)$$

Substituting for *b* its value—

$$b = (\text{L} - a),$$

the equation becomes—

$$\text{B M} = \frac{\text{W} (a \times \text{L} - a) \times \text{L}}{2 \times \text{L}} \;\ldots\ldots\ldots\; (2)$$

It was at one time considered that the equivalent uniform load was equal to an amount which would give rise to the same bending moment, and consequently the same stress upon the flanges at the centre of the girder, as obtained from the other methods of calculation already enumerated. Using the same notation as in the equation (1) and (2), the problem resolves itself into that of determining the bending moment, from the data at our disposal, upon the centre of the girder along the dotted line *cc* in Fig. 1. In this instance, therefore, we have $a = \frac{\text{L}}{2}$, so that the expression becomes—

$$\text{B M} = \frac{\text{W} \times \text{L} \left(\frac{\text{L}}{2} \times \text{L} - \frac{\text{L}}{2}\right)}{2 \times \text{L}} \;\ldots\ldots\; (3)$$

from which we obtain—

$$\text{B M} = \frac{\frac{\text{W} \times \text{L}^2}{2} \left(\frac{2\,\text{L} - \text{L}}{2}\right)}{2 \times \text{L}} \;\ldots\ldots\; (4)$$

Reducing and dividing out the formula is finally brought to the form—

$$\text{B M} = \frac{\text{W} \times \text{L}^3}{8 \times \text{L}} = \frac{\text{W} \times \text{L}^2}{8} \;\ldots\ldots\; (5)$$

Further experiments and additional investigations led to the conclusion that it would be preferable to regard the bending moment as acting not at the half, but at the quarter span, which may be computed in the following manner. It is evident that in this case the values of *a* and *b* are—

$$a = \frac{3 \times \text{L}}{4}, \text{ and } b = \left(\text{L} = \frac{3\,\text{L}}{4}\right)$$

Putting these values in equation (2) it becomes—

$$\text{B M} = \frac{\text{W} \times \text{L} \times \frac{3\,\text{L}}{4} \times \left(\text{L} - \frac{3\,\text{L}}{4}\right)}{2 \times \text{L}} \;\ldots\; (6)$$

Solving for the bending moment, we find it equal to

$$\text{B M} = \frac{\frac{3 \times \text{W} \times \text{L}^2}{4} \times \frac{\text{L}}{4}}{2 \times \text{L}} \;\ldots\ldots\ldots\; (7)$$

Simplifying and cancelling—

$$\text{B M} = \frac{3 \times \text{W L}^2}{32} \;\ldots\ldots\ldots\ldots\ldots\ldots\; (8)$$

From this equation the value of W is given by the expression—

$$\text{W} = \frac{\text{B M} \times 32}{3 \times \text{L}^2} \;\ldots\ldots\ldots\ldots\ldots\ldots\; (9)$$

If we compare this equation for the equivalent distributed load with (5), it will be seen that it errs on the safe side, if there be any error at all. For both the equations (5) and (9) the bending moments must be de determined *a priori* for each particular case.

The rolling load for the Forth Bridge consisted (1) in trains of unlimited length upon each line of rails weighing each one ton per foot run, and (2) of trains upon each track made up of a pair of engines and tenders, weighing together 142 tons, at the head of a train of 60 short coal-trucks, of a weight of 15 tons each. We must reserve for our next article the determination and tabulation of the longitudinal stresses brought upon the flanges, and the shearing stresses upon the web by a rolling load. Except in amount, the flanges or chords are not much affected by a rolling load, and are never subject to reversals; but the diagonal members of the web are exposed to alternate stresses, which, as will be pointed out subsequently, is the cause of the necessity of employing counterbraces.

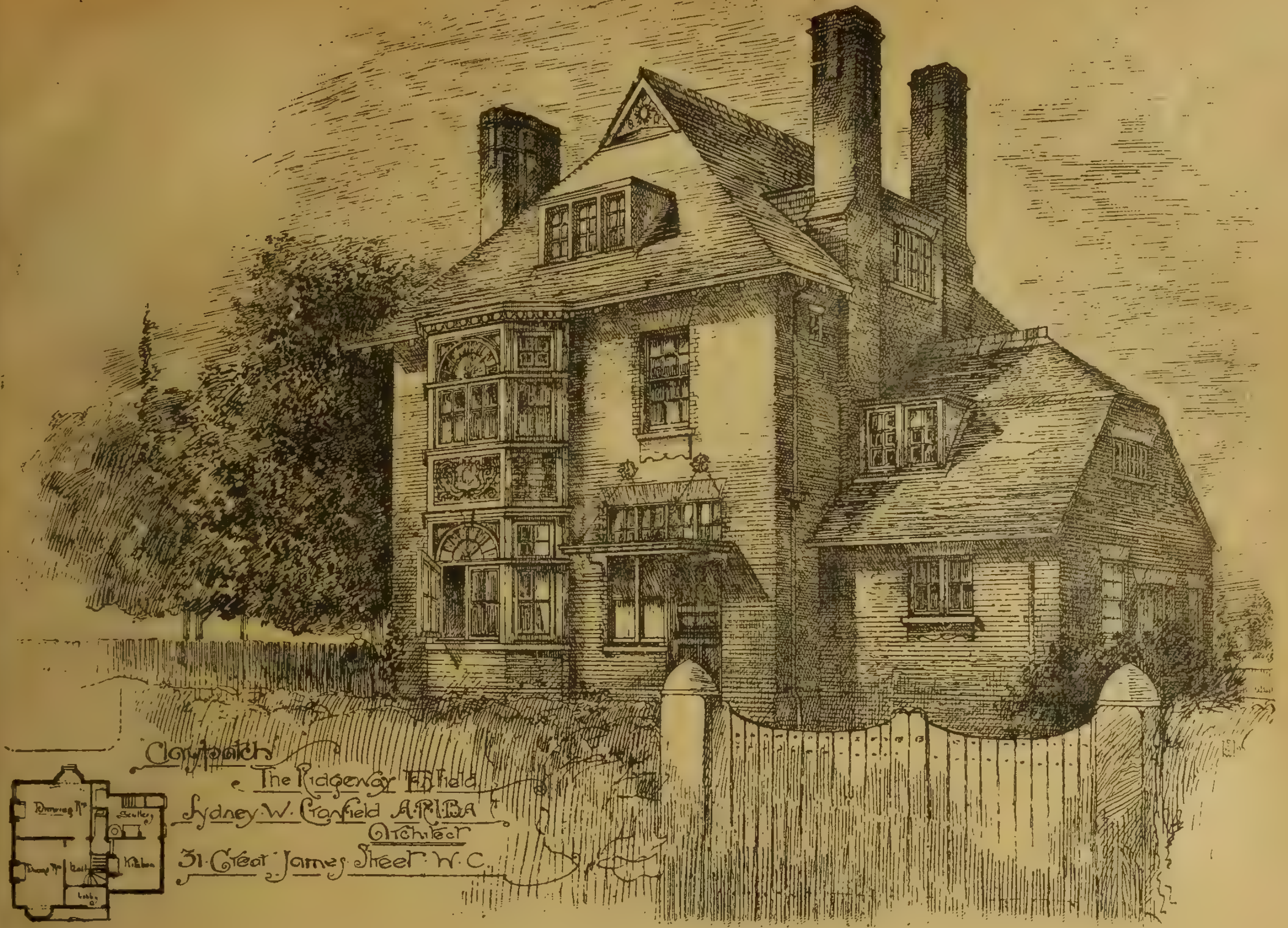
MORTAR OF MIXED LIME AND CEMENT.

CONSIDERING sand as an ingredient common to the preparation of all mortars, they may be classed under three general heads. First, mortar made with ordinary lime; secondly, made with hydraulic lime; and, thirdly, made with cement, either natural or artificial. It will be as well to distinguish between these two descriptions of cement. A natural cement is a substance produced by the ordinary process of calcination of a natural rock or stone. An artificial cement, on the contrary, is made by mechanically mixing, pulverising, and burning certain ingredients in certain proportions. Roman cement in England and the Rossendale cement in America constitute the two most widely known examples of the natural production. The first of these is manufactured from the septaria or calcareous nodules of the beds of the London clay, or of those of Kimmeridge in Dorsetshire. It is quick-setting, but undergoes serious deterioration from age and exposure to climatic influences. For these and other good reasons, it has been almost entirely superseded by its rival artificial compounds. The Rossendale cement is prepared from silicious or argillaceous limestones, containing less than 76 per cent. of carbonic acid, or from an argillo-magnesian limestone containing less than the same percentage of both the carbonate of lime and the carbonate of magnesia.

As an artificial preparation, Portland cement has no equal all the world over. It is the sheet anchor of the architect and the engineer, and there is no doubt that but for its valuable aid many constructive works carried out in modern times would have been well-nigh impossible of execution. In the manufacture of these two classes of cement there is one principal difference. Roman cements are burnt with a comparatively small amount of fuel and at a correspondingly low temperature. On the other hand, Portland cement is burnt at a very high temperature, which may be pushed to nearly the point of vitrifaction. There are just one or two other artificial cements which, as we are on the subject, are deserving of a brief notice. That patented under the name of "Lafarge" cement very much resembles Portland, but possesses one highly important advantage not incidental to Portland or the natural cements: it does not stain limestone or marble or any kind of porous stone, and in consequence is very much employed in setting and backing up the stonework in large and handsome buildings, both public and private. Another, Keene's cement, made by recalcining plaster of Paris, after immersing it in a saturated solution of alum, forms an excellent plaster, and is manufactured of two qualities, coarse and fine, to suit different styles of work. The latter is perfectly white, and readily takes a very high degree of polish; but the former does not, and is not intended to, possess these qualities to the same extent. Both set hard, and are much used for cornices, artificial marbles, and the internal decoration of buildings.

It is difficult to delimitate the exact stage of transition between hydraulic limes and hydraulic cements, although the former class pass into the latter by an almost imperceptible gradation. Should the natural limestones contain an admixture of from 15 to 25 per cent. of foreign substances, the result is a hydraulic lime. If clay constitutes the principal foreign ingredient, the limestone is argillaceous; but, if silica takes its place, the stone is of a silicious character. When a large proportion of these impurities, as they are sometimes termed, ranging from 25 to 65 per cent., are present, hydraulic cements are the consequence. At the same time, it is not by any means a difficult matter to distinguish the one from the other. Hydraulic limes, when mixed with a fair proportion of water, slake rather slowly, give out but little heat, and do not increase in bulk more than about a third of their original volume. But the case is very different with hydraulic cements. They do not slake when mixed with water, do not perceptibly increase in either bulk or temperature, and set more rapidly under water than any other class of cementitious substances, with perhaps the exception of Medina cement. It has not been found profitable nor requisite to manufacture hydraulic limes, either in America or generally in other countries, though an exception may be made with respect to the silicious limestones in France from which the well-known hydraulic limes of Teil are manufactured. When it becomes a question of first-class work, natural cements are not in the running with Portland, and there are certain purposes, such as the fabrication of artificial stones, paving-setts, and concrete, to which it is alone and pre-eminently suitable.

To the three classes of mortar enunciated at the commencement of our present article we now propose to add a fourth, which is not as well known and recognised as it deserves to be, and is briefly described in the title given to it. It has long been observed that when a comparatively very small quantity of cement is added to an ordinary lime mortar, some very marked modifications take place in it. The chief of these new properties imparted to it are a considerable diminution in its shrinkage or contraction, that is its decrease in bulk, and a correspondingly large increase in its power of resistance. Experiments have shown that if a mortar be composed of one part of lime and three parts of sand, and one-tenth part of cement be added to it, the resistance it will offer to compression will, after it has been allowed to set for a month, be three times that possessed by an ordinary lime mortar mixed in the proportion of one part of lime and two parts of sand. It will also develop a cohesive strength, and an adherence to brick or stone double that of the plain mortar. If, again, keeping the amount of the other ingredients constant, the proportion of cement be raised to one-seventh, the resistance to crushing will be increased to four times that of plain lime mortar, and to six times if the fraction be made equal to one-fifth. There is no practical advantage to be gained in further augmenting the proportionate quantity of cement, for two very good reasons. In the first place, the small additional expense incurred so far is fully justified by the results obtained, and, in the second, a greater resistance in mortar employed in the building of even large and massive erections of stone and brickwork is not required, and, therefore, obviously would not warrant an extra expenditure whose only object would be to confer a redundancy of strength upon the material. A very similar effect will be produced by adopting the same process in the case of cement mortar, substituting a small quantity of slaked lime instead of cement. An



addition of a very small percentage will much improve both the tensile and compressive strength of the mortar, and give it a greater power of adhesion than it would otherwise possess. It has been found that if to a cement-mortar, composed of one part of cement and two parts of sand by volume, one part of lime, also measured per volume, be added, the resistance to tension will be increased ten per cent., that to compression 20 per cent., and the strength of its adhesive properties as much as 25 per cent. The exact part played by the small quantity of either cement or slaked lime, added to the two descriptions of mortar in augmenting their valuable qualities, has never been satisfactorily accounted for nor explained. However, the results obtained strongly resemble those produced by mixing an almost minute proportion of one metal to a large mass of another of a totally different kind. As an example, a percentage of from 0·15 to 0·45 of pure carbon converts ordinary wrought iron into soft steel; an increase from 0·45 to 0·55 per cent. gives it the constitution of intermediate or mild steel, so much used for bridges, roofs, and ship-building; a further addition from 0·55 to 1·50 produces hard steel, and when the percentage attains to 2·0 and over the steel virtually passes into the condition of cast iron. The effect of adding a minute dose of spiegeleisen or oxide of manganese to steel is well known to all metallurgists and those engaged in the wroughting of iron and other metals.

T. C.

The corner-stone of the Victoria Theatre, Broughton, Salford, is to be laid by Sir Henry Irving, at noon, on Wednesday, the 4th prox.

A circular letter has been addressed to the various local authorities throughout the country by the Local Government Board, drawing attention to the Small Dwellings Acquisition Act, 1899 (62 and 63 Vic. c. 44), which contains important provisions for facilitating the acquisition of small houses by persons who desire to reside in them, by enabling local authorities to advance, under certain conditions, part of the purchase money. The chief points respecting these provisions are set forth in the circular.

"CLAYPATCH," RIDGEWAY, ENFIELD.

THIS house, lately completed, is built with red Suffolk bricks, the roofs being covered with red tiles. The plan is so arranged that the principal rooms enjoy extensive views, the kitchen and offices being placed on the north. The general contractors were Messrs. Gibson Bros., of Enfield. This drawing was exhibited in this year's Academy. The architect is Mr. Sydney W. Cranfield, A.R.I.B.A , architect, Lincoln's Inn-fields, W.C.

NEW BUILDING CODE FOR NEW YORK.

A FRESH code of building regulations for New York has just been presented in draft form to the municipal assembly of that city, having been for eight or nine months in course of formulation by a building code commission. The new draft regulations are divided into 36 parts and subdivided into 164 sections. For the first time there is a section on the quality of materials, specifying the properties of brick, sand, lime, cement, concrete, timber, and metal which may be used. The old antiquated section on testing materials of construction has been expunged, and one in accordance with modern practice substituted. Many changes have been made, says the *Engineering Record*, in the regulations concerning excavations and foundations. The law now grades the bearing capacity of soils from one ton to the square foot on soft clay to four tons on firm coarse sand, stiff gravel, or hard clay. Whenever a test of the bearing power of soil is made, the Commissioner of Buildings must be represented, and a record of the test filed with his department. The allowable pressure under footings has been fixed with regard to the present practice of considering but a portion of the entire live load under many circumstances. For example, in warehouses and factories the full live load is prescribed; in stores and buildings for public assemblies 75 per cent. of the live load is specified; while in dwellings, office buildings, hotels and stables, 60 per cent. is to be the basis of figuring. The section on piles and pile driving has been altered, and the bearing capacity of piles must now be figured by the formula introduced by the late A. M. Wellington. The unit values adopted for determining the safe carrying capacity of wooden beams have been made to accord with the experimental studies of Professor Lanza and others. The live loads on floors have been so reduced as to be more nearly in accord with the actual loading which will come on floors in structures of various classes. In dwellings, for example, the live load may now be figured at 60lb. to the square foot; in office buildings, schools, &c., 75lb.; in places of public assemblage, 90lb.; where light manufacturing and storage must be provided for, 120lb.; in buildings for heavy manufacturing and the storage of heavy goods, 150lb. is specified. While the uniform thickness of brick walls in skeleton buildings is not provided, yet the thicknesses in the proposed law are much less severe than those heretofore required. In this part of the code compromise had to be resorted to by the advocates of the best practice in order to obtain any marked improvement over the old regulations, for the mason trade, which is directly concerned in such provisions, was strongly represented on the commission. The safe loads on brickwork which the law now specifies range from 8 tons to the square foot where lime mortar is used to 15 tons with Portland cement mortar. The strength of concrete of various proportions has also been specified.

The old section relating to factors of safety has been replaced by one according with modern practice. The section fixing the allowable unit stresses for columns of wood and metal, while leaving something to be desired, is yet brought practically into accord with good engineering practice. Wind pressures are provided for in a separate section. A marked feature of the new regulations is a section giving the safe carrying capacity of various materials of construction, except in the case of columns, for practically all situations.

The construction of the line to connect Truro and Newquay by way of Chacewater has been commenced.

THE BRITISH ASSOCIATION AT DOVER.

THE meetings of the British Association scarcely maintain their old reputation for interest, and this year's gathering at Dover has not been distinguished by very striking originality in the address of the President, Sir Michael Foster, or by any very brilliant papers or lectures; and the absence of an illustrious and veracious explorer, such as the picturesque narrator who enlivened last year's proceedings at Bristol, was sorely felt by the bored audiences in several sections. The presidential address delivered on Thursday night reviewed the progress made in biology, geology, and electricity during the present century, and the outlook of these sciences at this time, and was published *in extenso* in last week's *English Mechanic and World of Science*, which to-day continues its report of the proceedings. We give, in accordance with our custom, a selection from some of the papers likely to interest our readers.

THE RELATION BETWEEN THE DOVER AND FRANCO-BELGIAN COAL-BASINS.

Mr. R. Etheridge said that the history of the stratified rocks of South-East Kent was now being determined. The Dover exploration was carried through the lower cretaceous, jurassic, and probably the upper series of the coal measures, with, so far, eight seams of workable coal to the depth of 2,225ft. How many more seams there are was not certain, but over 100ft. of the coal measures below the thick or 4ft. seam had been tested, and yet the coal-measure floor had not been penetrated. The discovery of these coal measures proved completely Godwin Austen's view of forty years ago that the coal measures which form part of the line joining the coalfields of Westphalia, Belgium, and north France with those of Bristol, North Somerset, and South Wales lie buried beneath the newer rocks in South-east England. The future commercial value to Dover and its neighbourhood might be inferentially seen from the fact that in 1850 there were only two collieries in the Pas de Calais field, producing annually 19,000 tons, while in 1895 there were 17 collieries producing over 11,000,000 tons. Comparing by maps, plans, and statistics of borings the coalfields of Brabourne and Dover with those of Belgium and South Wales, Mr. Etheridge showed first that Professor Prestwich's view was probably correct—namely that the Dover field was one of a chain of isolated coal-basins that extended from Prussia to the south of Ireland, and passed under the Straits of Dover; then that the coal at Dover was workable at a depth comparing very favourably with (and, indeed, much less than) the depths worked in South Wales and Belgium; and, thirdly, that in the quality, chemical composition, and heating power of the anthracite and other kinds obtained in Wales, Somerset, Dover, and the Franco-Belgian fields the agreement was almost complete, while a similar agreement existed in the similarity of mass and condition of the beds and their relation to the strata above and beneath. The continuity could not be doubted, as in every particular the fields were the same throughout. Nor could success be doubted if one considered the known great capacity of the French and Belgian fields. The significant question was—Were the coals at Dover able, in respect of the depth and quality of the coal, to be worked at a profit? The answer was that eight seams had been reached, the lowest 4ft. seam being 2,225ft., and many coalfields were worked at much greater depths, 4,000ft. being the depth fixed by the Royal Commission of 1871, under the presidency of the Duke of Argyll, as being the limit of the safe working, on account of the underground temperature at that depth being 98° Fahr., or blood heat. Therefore, there was every indication of the possibility of profitable working of the Dover coalfield; and it was a matter not only of scientific, but of national and commercial interest.

THE SOUTH-EASTERN COALFIELD.

Professor Boyd Dawkins, F.R.S., observed that the discovery was of great practical value, as it would probably result in the same development in Kent of industries and manufactures which had taken place where the coal had been worked, under the same conditions, under the cretaceous and jurassic rocks in France and Belgium. It was of equally great theoretical value, as it proved up to the hilt the truth of Godwin Austen's view, published in 1858, that the coal measures lie buried underneath the newer rocks in South-Eastern England. The first boring to be noticed was at Ropersole, a spot near the highway between Dover and Canterbury—eight miles from Dover, at 400ft. above O.D.—the surface being composed of upper chalk, with a thin stratum of clay-with-flints. It was begun at the close of 1897, and had at the present time pierced the strata to the depth of 1,773ft. 7in. In his opinion, the coal measures of Ropersole were a portion of the same series as those at Dover. Here, as at Dover, the question of seams of coal resolved itself probably into a question of sinking deeper. Here only two unimportant seams had been met with in a thickness of 197ft. There twelve seams were penetrated in a thickness of 1,054ft. 6in., the thickest 4ft. seam being at the bottom. The Ropersole boring established the fact that the Dover coal measures extended northwards for a distance of eight miles and beyond in the direction of Canterbury. The coal measures set in in Kent at a sufficient distance to the north-east of Brabourne to allow of the presence of the carboniferous limestone and millstone grit. Their south-western boundary could only be accurately defined by further borings, such as those which were now being carried on at Ottinge, about two and a half miles to the north-east of the scarp of the Downs, and six miles to the south-west of Ropersole. Their range to the north and the east still remained to be proved. They were, however, continued under the Channel, and had been proved by the boring at Calais in 1850, as well as those carried out in 1898 at Strouannes, near Wissant. The thickness and value of this south-eastern coalfield could only be estimated by the exposed coalfields of Northern France and Belgium and of Somerset. That of Liège was 7,600ft. thick, and contained 85 seams, presenting an aggregate thickness of 112ft. of workable coal. That of Mons was 9,400ft., with 110 seams yielding 250ft. of coal. In Somerset the coalfield was 8,400ft. thick, the seams were 65 in number, and yielded 120ft. of available coal. It was obvious from these figures that the possibilities of the south-eastern coalfield were very great, although it still remained to be proved how far these great thicknesses of rock had been denuded in Kent before the deposition of the triassic and jurassic rocks. To sum up, the results of these borings were likely to bring about the same economic revolution in Kent as was brought about in France by the extension of the coalfield of Valenciennes and Mons. They knew now by experiment, not only where to seek, but also where it was advisable not to seek, for the coal measures.

CONTRASTED AND COMPLEMENTARY COLOURS.

Mr. G. J. Burch, in a paper on the "Spectroscopic Examination of Contrast Phenomena," pointed out that by exposing the eye to bright sunlight in the focus of a burning-glass, behind a screen composed of ordinary ruby glass in conjunction with a gelatine film stained with magenta, a condition of temporary red-blindness may be induced, during which red flowers, such as scarlet geraniums, appear black, and red roses blue, although the observer is still perfectly able to distinguish colours composed of green, blue, and violet. Similarly, blindness to green, to blue, or to violet may be produced by fatiguing the retina with monochromatic light of sufficient intensity and of suitable colour. These phenomena he regarded as unfavourable to the theory of Hering, but as supporting that of Young and Helmholtz, if the existence of a fourth primary sensation—that of blue—be granted. He exhibited apparatus by which the methods of spectroscopic analysis may be applied to the investigation of the phenomena of complementary colours, and of successive contrast by intermittent light.

VARIATION OF THE SPECIFIC HEAT OF WATER.

Professor H. F. Callendar, F.R.S., and Mr. H. T. Barnes, in a paper on this subject, described their steady-flow electric calorimeter, by which a measured amount of electric energy is used to heat a constant stream of water flowing through a narrow tube, the temperatures of the inflowing and issuing water being measured by a differential platinum-thermometer. A comparison of the results with those of other observers indicates that the specific heat of water decreases rapidly from 0° C. to a minimum, which is variously fixed at 20° to 40°; after which it rises again with increased temperature.

UNIFORM EXPANSION OF PORCELAIN WHEN HEATED.

Mr. T. G. Bedford communicated the results of his experiments on the expansion of porcelain with rise of temperature. The method used was that of observing the distance between two marks on a hot porcelain tube during its cooling, the temperature being determined by the resistance of a piece of platinum wire running along the axis of the tube between the marks. The results show a small and nearly constant expansion-coefficient between 0° and 600° C., with only slight variations above that temperature.

THE DEPTH OF THE OCEAN FLOOR.

Sir John Murray presided in Section E, Geography, and in his address entered into some very interesting details with respect to the floor of the ocean. He mentioned that considerably more than half of it lies at a depth exceeding two geographical miles, and that the greatest depth, 5,155 fathoms, or over five geographical miles, is to the east of the Friendly Isles in the South Pacific.

THE INDIAN FOREST DEPARTMENT.

In his Presidential address to Section K, Botany, Sir G. King severely criticised the present management of and training for the Forest Department of India. The men who took a leading part in moulding the department were, he said, all botanists, and to most people it would appear fitting that the possession of a knowledge of, and liking for, botany should form a strong characteristic of officers whose main duties were to be in the forest. But that principle did not now appear to guide the department. For example, at the entrance examination to the Forest School at Cooper's Hill, only three subjects were obligatory for a candidate—viz., mathematics, to which 3,000 marks were allowed; German, to which 2,000 were allowed; and English, for which 1,000 were given. Botany was one of the nine optional subjects of which a candidate might take up two, and in each of which 2,000 marks might be made. Botany was taught at Cooper's Hill, and formed one of the "special auxiliary subjects" for the forest student. But the ordinary forest officer educated in England now arrived in India without sufficient knowledge to enable him to recognise from their botanical characters the most well marked Indian trees. To tell such an officer the name of the natural family to which a plant belongs conveyed no information to him whatever, for he knew nothing of botanical affinities. Moreover, the forest officer, after he had arrived in India, was not encouraged to familiarise himself with the contents of the forests under his charge. The general decadence of the teaching of systematic botany in England during the past twenty years was, perhaps, to some extent the cause of the low estimation in which the science was held by the authorities of the Indian Forest Department.

PREHISTORIC REMAINS.

The President of the Anthropology Section, Mr. C. H. Read, divided his opening address into two parts, the first treating of our prehistoric antiquities, such as barrows and tumuli, from the point of view of their preservation and proper explanation. He pointed out that, although these were the only means we had of reconstructing the story of our ancient British ancestors, they were gradually being destroyed by cultivation and ignorant exploration. He made an appeal to local scientific societies to register all such remains, and to keep in touch with owners and tenants so as to control exploration. The second part of the address dealt with the present state of anthropology in this country, showing how little was being done with vast quantities of important material. After referring to the bureau of ethnology scheme, Mr. Read passed to the neglect of our opportunities of gathering material of study. The remedy he proposed was that the Government should take over the rest of the Imperial Institute for a central anthropological and ethnographical collection, with a Chair of Anthropology in the London University next door.

STONEHENGE.

Dr. Eddowes read a paper on some new observations and a suggestion on Stonehenge. He believes that the thirty large upright stones, with their intervals, indicate that the circle was divided into sixty equal parts, that the grooved stone (which is the best selected, worked, and preserved stone in the whole ruin, but has never hitherto received the attention it deserved) was used for supporting a pole in a definite and permanent manner, and that the signs of wear at the mouth of the groove, together with the two worn horizontal hollows or waists, and the dimples on the convex back of the stone, indicate not only where, but how this pole was fixed. Such a pole would form the pointer of a sun-dial for daily observation, or—what was more important—an indicator of the time of year by the length of its shadow. The levelled avenue (along which the sun's shadow would fall about 3 p.m.) and the flat "slaughter-stone," with its arrow-head marking, seemed to the author to support his view. A report was afterwards submitted by a committee upon the results of recent excavations in the Roman city of Silchester, and upon the lake village of Glastonbury.

BACTERIAL TREATMENT OF SEWAGE.

In the Chemistry Section, Professor Clowes read a report on the "Intermittent Bacterial Treatment of Raw Sewage in Coke Beds." This process was at first experimentally carried out by the London County Council for the treatment of the effluent from chemically-treated sewage, but is now applied to raw sewage screened through coarse gratings. Coke of the size of walnuts is used, and beds from 4ft. to 13ft. deep have been tried. One treatment on the coke beds removes all the fæcal matter, and 50 per cent. of the dissolved organic matter, whilst a second treatment removes a further 20 per cent. of the dissolved organic matter. The mode of procedure is to leave the sewage in contact with the coke for three hours, and then allow the coke to stand empty for seven hours for aëration. The effluent supports the life of fish, and neither it nor the coke becomes foul, although no bacterial improvement is brought about by the treatment—a factor that is advantageous for the final stages of purification. The efficiency of the filters falls off in time owing to clogging with the cellulose fibres derived from wood-pavements, straw, &c., but much of this can be removed by a preliminary sedimentation and disposed of in a destructor. Fresh coke requires five or six weeks to get into working order; in dry weather, when the sewage is less dilute, the working is less satisfactory.—Mr. W. Scott-Moncrieff followed with remarks on "The Place of Nitrates in the Biolysis of Sewage." He said there were three methods of recovering the nitrogen from sewage, the disposal of sewage directly on the land, the chemical precipitation of the sewage in the form of sludge, and the method described by Professor Clowes. The bulk and dilution were the obstacles in the first method, whilst the second was not satisfactory. The third, however, properly conducted, was good—in fact, as the late Sir Edward Frankland remarked, it was a fermentative process like brewing, and, as the author said, the method of Nature herself artificially aided. Sewage was a complex mixture, therefore different organisms had to work to break up the combinations. Hence the desirability of letting the process go on in stages. Professor Warington, in opening the discussion on these papers, remarked that the process described by Professor Clowes was really neither anaërobic nor aërobic, but partook of both characters. It seemed to him that neither had full play. Mr. Dibdin pointed out that the bacterial treatment, as described, was a success, and could, by making a suitable bed, be made to yield an absolutely pure effluent, which was not always necessary. The important feature of Professor Clowes's communication was the successful treatment of the sludge, which in London amounted to 40,000 tons a week, and cost a considerable sum to take out to sea. He remarked that the sewage of Leeds had been successfully treated on the coke beds, although it contained a large proportion of chemical refuse. Mr. Douglas Archibald questioned whether the bacterial treatment of sewage would be as efficient as the chemical treatment in destroying dangerous organisms.

MUNICIPAL TRADING AND PROFITS.

Mr. Robert Donald read a paper on this subject in the Section of Economics and Statistics. There should be no reason, he thought, to object to municipal training from a commercial point of view, as the figures in a recent Government return showed that the average annual profit on municipal water, gas, and electricity works, markets, tramways, and workmen's dwellings amounted to $4\frac{1}{2}$ per cent. on the capital invested. The chief opposition to municipal trading last Session of Parliament arose with electricity supply. Municipalities produce electricity at a lower cost, and supply it at lower prices than do companies. A comparison between 21 municipal and 21 company undertakings, including in the latter the large London concerns and the companies of Birmingham, Leeds, and Sheffield, where the supply has been recently municipalised, showed that municipalities produce electricity at $\frac{3}{4}$d. less per unit than companies, sell it at 1d. less per unit, and earn only $\frac{1}{4}$d. per cent. less profit. Municipalities as a rule supplied gas of a higher illuminating power than companies and at a lower price. A comparison between a representative number of municipal and privately-managed gas works showed that the average price of the municipal gas is less by 3d. per 1,000c.ft., the candle power is higher, and the average profit on capital employed only 1 per cent. less than that obtained by companies. The direct operation of tramways by corporations had been done under easy conditions as regards capital expenditure and had at once led to increased traffic. There had been a readier response to public demands, a reduction of fares, and better treatment of employés. Municipal trading compared well with private enterprise. But it was not enough to show profits from municipal trading. The aim of municipalities should be to provide the cheapest services at cost price rather than seek profit. The system of relieving general local taxation out of the surplus revenues of gas, water, tramway, and other undertakings had been necessary in order to demonstrate the business capacity of municipal bodies; but the policy was not one which best served a community. When a town drew profit from gas, water, or electricity supplies it was simply levying so much direct taxation on the users of these commodities for the benefit of the general community. It was becoming the practice not to make trading profits from water supply, and only a small margin of profit was sought on artisans' and labourers' dwellings and lodging-houses. The practice of Parliament tended towards restricting profits. Profit from electricity supply works, for instance, was limited to five per cent. All surplus above that should be devoted to reducing charges. It would be found that in the towns where the civic spirit was the keenest and healthiest, where municipal institutions were most largely developed, there the profit sought was least and the administration was the best.

PREHISTORIC IMPLEMENTS FROM IRELAND.

Mr. George Coffey contributed two papers, the first being on Irish copper celts, and the second on stone moulds for new types of implements from Ireland. Celts apparently of unalloyed copper, though rare compared with those of bronze, had been found in considerable numbers in Ireland. One specimen was analysed by J. W. Mallet in 1853; it gave copper, 98·74; tin, 1·09. Eight other specimens analysed this year had all given over 96 per cent. of copper. The copper celts were invariably of the plain flat type, without ornament, and in no instance showing even rudimentary stop ridges. Ten specimens closely resembled common forms of Irish small stone celts. Some of these might be regarded as ingots, but in four instances they had been ground to an edge for use. The examples of developed metal form were in general ruder and heavier than bronze celts. In some cases the rough surface marks of casting had not been removed, but in many instance these celts showed traces of having been rubbed down over the body of the celt after the manner of stone celts. Mr. Coffey in his second paper showed that the stone moulds represented the transition from dagger to spear heads. Some were made to be "tanged" to the handle, and some for insertion into sockets. One example was remarkable as showing that the shaft was cast in one mould and the blade in another, and that the two parts were then burned together.

GEOLOGICAL TIME.

In his presidential address to the Section of Geology, Sir Archibald Geikie discussed the question how far the reproach was well founded which has been so often brought against geological authorities in that they deal vaguely and recklessly with time as a factor in geological history, and restated the present position that geologists considered themselves entitled to maintain, contending that the researches of geologists and palæontologists led to the conclusion that the history recorded in the crust of the earth must have required for its transaction a much vaster period than that to which physicists would now restrict it. He expressed the desirability of establishing a basis of actual experiment and measurement for the consideration of geological problems.

ORIGIN OF GROOVES ON GRANITE.

Mr. W. W. Watts contributed, with specimens and maps, some observations on the surface of the Mount Sorrel granite. He said it had long been known that, when first exposed in the quarries, the granite of Mount Sorrel exhibited a smoothed, grooved, and slightly terraced aspect. As the surface, when first discovered, was covered with boulder-clay, it had been concluded that it was produced by glaciation. For some time he had had doubts with regard to this interpretation, and recent excavations near Mount Sorrel had thrown a new light on the phenomenon. At Hawkley Wood and Nunckley Hill a similar but smaller surface had recently been exposed, which was covered by undisturbed Keuper Marl, while a second surface, exposed at Nunckley Hill, had boulder-clay abutting on it. Thus the grooving, terracing, and smoothing, like so much of the scenery in Charnwood Forest, was originated in Triassic times, though locally it may have been somewhat modified by glaciation.

COAST EROSION.

Captain McDakin read a paper on "Coast Erosion," dealing with the district from Deal to Dover, Folkestone, and Sandgate. He considered that although the falls of the cliff amounted to thousands of tons, the area lost had not been great in historic times, for the Roman lighthouse at Dover Castle and the foundations of a similar structure on the western heights showed that their position with regard to the coast was very much the same now as it was nearly 2,000 years ago. The more rapid destruction of the Dover cliffs within the last 50 years was curiously enough due to those structures which might be supposed to protect the coast—the breakwaters at Dover and Folkestone, which intercepted the shingle that would otherwise form a natural protection to the coast. Mr. G. Dowker, who had worked with Captain McDakin, read a short paper on the same subject, dealing with the district from Walmer to Whitstable. Mr. W. Whitaker, F.R.S., read a preliminary report upon the erosion of the sea-coast of the United Kingdom. He showed how during the past year this important subject had begun to be systematically studied over the whole of our sea-coast. The council of the British Association last year had called the attention of the Admiralty to the desirability of securing systematic observations upon coast erosion, suggesting that the services of the coastguard might be utilised for the purpose. A committee of the Association had been formed and had sent forms of inquiry to all the coastguard stations. This report dealt with the answers on coast erosion and upheaval received from 426 different stations.

THE ORDNANCE SURVEY.

Colonel Sir John Farquharson described "Twelve Years' Work of the Ordnance Survey." He said that in October, 1887, he was ordered to take up at Southampton, where the headquarters of the Survey were established, the duties of executive officer, or second in command, of the Ordnance Survey. Sir Charles Wilson was then Director-General; and in March, 1894, he succeeded that officer in the latter position, which he retained until March of this year, when, on the expiry of his five years' term of office, he handed over the duties to Colonel Duncan A. Johnston, R.E., the present Director-General. During the twelve years he was connected with the Survey there had been probably more changes made in the character of the work done than in any other equal period of its history; and, as regards the areas covered by its operations, they had been largely in excess of the areas covered during any previous equal period. This was, of course, due to the fact that revisions had now largely taken the place of original surveys. Sir John detailed the progress (to completion in 1890) of the original cadastral survey of England and Wales, including the 6in. surveys of uncultivated districts, the progress made on resurveys for the larger scales of various counties of England and Scotland which had been originally surveyed for the 6in. scale only, and the progress made on the revision of the original cadastral surveys of England and Scotland, whether on the 25in. or 6in. scale, and other matters. An account was then given of the nature, causes, and results of any changes made since 1887 in the system of carrying out the survey, some of which were due to the reports of committees or suggestions from the general public, while others had been necessitated by the changes which had taken place in the character of the work done by the department. As to the style and quality of the maps on all scales both old and new, specimens were provided for inspection by members of the Association. Specimens of foreign maps, so far as available, were also provided for inspection and comparison with the English maps. In the course of a discussion which followed, Colonel Duncan Johnston, the present Director-General of the Survey, said that arrangements had already been made to push forward as rapidly as possible the revised 1in. map with hill sheets. For the present, owing to want of space, the department was tied as to the amount of work they could do, but new buildings were to be provided, and in a few years they would be able to get on faster. Within the limits of space they were doing everything that could possibly be done to push on the 1in. map. The completion of the coloured 1in. map must take a considerable time. With regard to pushing on the four-mile map and the ten-mile map, the drawing of the former was now completed, and the engraving would be entered upon as rapidly as possible. There had been a great many changes in the Ordnance Survey during the last few years, and those changes had all conduced to make the work slower; but every endeavour was being made to push on the work as rapidly as possible, consistently with the work being properly done. Mr. H. T. Crook criticised adversely the work of the survey in several particulars. All this vast work of revision would never have been undertaken had it not been for the resolution adopted by the Association and subsequently by the Geographical Society, and for the action taken in the House of Commons. They must look to the influence of outside public opinion to get the national work properly and efficiently done. There was a strong feeling among those interested in the work of the survey that the consequences attributed to the changes made need not have occurred. He complained that the change in the method of production of maps had brought about a change in quality. Land registration was desired in the country, but the cadastral surveys of the towns, which was most important for small holders, was no longer produced. He also complained of the deterioration in the 6in. map in several respects. Sir J. Farquharson said that the engineer of the Great Central Railway had declared that no map in the world could compare with our 6in. maps. If a railway engineer could lay out his railway with these maps, he thought they might be regarded as satisfactory.

EXCAVATIONS AT SILCHESTER.

Mr. J. L. Myres (secretary) admitted the report of the committee appointed to co-operate with the Silchester Excavation Fund Committee in their excavations in the Roman city of Silchester. The operations were begun on May 2, 1898, and continued, with an interval during the harvest, till November 26. Mr. Myres gave lantern illustrations of the area of the work, and of the various finds of iron, bronze, and bone objects.

SEQUENCES OF PREHISTORIC REMAINS.

Professor W. M. Flinders Petrie read a paper on this subject, remarking that in written history the value of chronology lay almost entirely in its defining the sequence of events, and if the order of changes in a civilisation could be fixed, the reference to a scale of years was but a secondary matter. Hitherto only very vague and general terms, covering large periods, had been used in naming prehistoric remains, those terms referring to places and not to age. The very incomplete records of discoveries made such terms the best that could be usually attained; but if we possessed a perfect record of an unlimited number of contemporary groups of objects (as from tombs), all of which objects had had a time of invention, popularity, and decay, and the use of which overlapped each other, it was clear that with patience it would be possible to arrange all the series of groups in their order of time, and so establish definite sequences among the various objects. Such a task would be like that of reconstructing the order of an alphabet from torn-up fragments which contained only two or three letters each, or settling the sequence of scattered geological beds from the remains found in each. If, then, a sequence could be established, a scale of notation was needed. As a scale of years was impossible, a scale of equal activities was the most reasonable. This might be reached by placing all the available material in order (from tombs, houses, &c.), and then dividing it into a scale of equal parts. Such a scale, though not equal in time, would yet give a fair unit for measuring a civilisation. From the records of the excavations that his party had made in Egypt, the contents of some thousands of prehistoric tombs were exactly known. Every type of vase, of stone or pottery, was defined in a corpus containing over 1,000 forms, so that merely a letter and a number defined precisely what was found. Thus, all the complexity of variations could be dealt with vigorously in a workable condition. The practical process for dealing with this material was by writing out the contents of each grave on one slip of card, and then sorting the cards into such order that there should be the minimum dispersion of each type number. The methods of sorting the cards into the original order of the graves (as nearly as possible) depended on various principles, as follows:—1. Any certain superposition of graves, one later than another. 2. Any clear and unquestionable series of changes of form or of manufacture. (These two principles served to fix the order of our scale, whether going forward or backward in time.) 3. Statistical methods; sorting graves by the relative proportions of types in common with ages before or after them. This was the way to place a large quantity of material roughly in order. 4. Method of style, serving to group in sequence the forms which were clearly intermediate between others, after their approximate place was already fixed by statistics. 5. Method of compression; the earliest and latest examples of each type to be examined, to see if it were possible to concentrate them. Such inquiry always resulted in revealing a tension between two or more types: either one must be earlier or another later than in other cases proved by their occurring together on one slip. The range of similar types helped to decide this. Practically a range in prehistoric Egypt of, perhaps, 1,000 years (may be half or double of that) was broken up into a scale of 50 parts of equal activities; and we could define the age of every type of object found in that scale, as 38 to 41, 53 to 65, &c.; these numbers might be termed sequence dates, or S.D. Pottery was the best material for study. But all other forms in stone, metal, ivory, &c., were useful evidence, though more liable to transmission and to copying. We reached thus a system for the exact definition of all that we could learn on prehistoric times; a system which could be applied to all countries where enough material could be studied, and which would enable us to exactly state any correlation discovered between the civilisation of different lands, when a sequence date of one country could be proved equal to a given sequence date elsewhere.

STEAM ON COMMON ROADS.

Mr. J. I. Thornycroft, F.R.S., read a paper in the section of Mechanical Science on "Recent Experiences with Steam on Common Roads." The author, after referring to the work of early inventors in this field, referred to the restrictions still put upon self-propelled vehicles by the law. The Locomotives on Highways Act, 1896, though removing some obstacles, was an imperfect measure. The clause pressing most hardly was that restricting the weight of the vehicle unladen to less than three tons. Merchants and manufacturers insisted on loads of from five to ten tons being dealt with; but it was commercially impossible to build a durable vehicle within the limits of the tare, although one might be constructed that would perform the service on trial runs. In France makers were allowed greater latitude. In Lancashire ten-ton loads were carried daily on horse-drawn lorries at a speed of two miles an hour. Steam-driven vehicles would transport greater loads at more than twice the speed and at about one-half the cost if the Act were amended in a satisfactory manner. In Lancashire a gross weight of 12 tons was not uncommonly seen borne on a tire width of 18in. The horses' hoofs were also a serious cause of damage to the road surface. A steam vehicle with a gross load of 16½ tons, ten tons of which would be a useful load, would require leading wheels 5in. wide and driving wheels 7½in. wide. Another plea for greater weight of vehicles was founded on the need for durability. In order to meet the regulations, many expensive modes of construction had to be followed, and the use of so costly a material as aluminium had to be introduced. The paper described a number of steam road vehicles designed by the author, among them being the steam tip-waggon, intended originally as dust carts for the Chiswick Local Board. Several of these were now in use, and each one could deal with 30 cubic yards of material per day, the men being on piecework. In some of the latter ones the body was of high-grade steel as used in torpedo-boat building. All the vehicles were fitted with a special form of Thornycroft water-tube boiler, fired through a door in the top. The speed of these tip-waggons was six and a half miles per hour with full load. The question of wheel construction was dealt with in the paper, and the author said he now used wooden wheels of special make, and iron or steel tires for the goods waggons, but indiarubber tires for passenger vehicles. A three-ton dray built for a firm of brewers had been running since last December; it could haul a trailer loaded with two tons more. Its owners considered that it replaced two three-horse drays. The average daily journey was 30 miles.

Sir Frederick Bramwell, who opened the discussion, after referring to the work of the earlier inventors, with some of which he was personally identified considerably more than half a century ago, pointed out that the success of railways discouraged the use of steam on common roads, though now, after the lapse of 50 years, it would seem that the time had come when this method of traction would be carried to a successful issue. He considered that, of the various methods of propulsion now being tried, steam would be the one to survive the competition.—Mr. W. Worby Beaumont pointed out the need of present regulations being amended, and some legislation being brought into force which would regulate the width of tires by the total load carried. There would be no excessive damage to the road if tires were sufficiently wide.—Sir Alexander R. Binnie, engineer to the London County Council, pointed out that, though the London streets would stand very heavy loads, the bridges and culverts on country roads were often not capable of carrying excessive weights.—Professor Fitzgerald wished to emphasise the immense importance of the road question. In Ireland they had some of the worst roads in the world, except the Thames Embankment; and this had an important bearing on the adhesion of the tires. An improperly-made road was far more expensive to keep up than one constructed on engineering principles.

GROYNES FOR SHORE PROTECTION.

A paper by Mr. E. Case on the "Dymchurch Wall and the Reclamation of Romney Marsh" was then read. The Dymchurch wall, he said, was a very ancient and important structure protecting a large tract of country. It had always been a difficult and expensive work to maintain until he introduced a new system of groynes, by means of which the natural beach was encouraged to grow up and thus form a protection to the wall at its base. The system broadly consisted of piles and battens, the former being bedded in rough blocks of concrete in place of being driven into the beach in the usual way. He was convinced that it was useless to erect groynes near high-water mark. His low groynes were constructed lower down on the beach, thus encouraging the deposition of shingle or sand higher up. The timber work was extended as the beach grew up.

The long discussion which followed turned chiefly on the question of the travel of shingle round points, piers, &c., authorities being divided on the question.

The meeting of the British Association for 1900 will be held at Bradford, opening on Sept. 5, Sir William Turner, F.R.S., being the president-elect; in 1901 the gathering will be held at Glasgow, and in 1902 at Belfast.

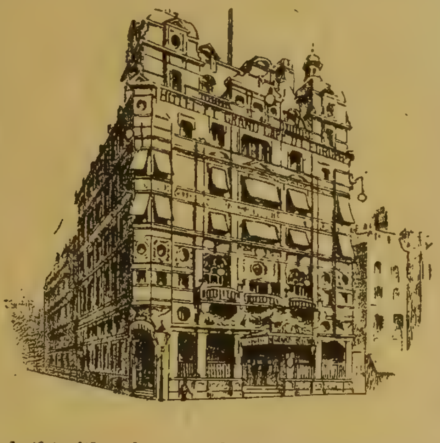
THE PHOTOGRAPHIC SALON EXHIBITION.

THE annual exhibition of the Photographic Salon, opened at the Dudley Gallery, Egyptian Hall, includes a few choice examples of artistic photography. The exhibitors comprise many foreign contributors and painters who have made the photographic art a study in a higher sense than we are accustomed to view it. In passing through the gallery we notice some very beautiful effects, many simulating water-colour drawings; others have a sketchy and crayon-like effect. Frank W. Birchall's "Trinity of the Dawn" (55), F. Holland Day's "Tree of Life," and "The Entombment" are admirable and clever reproductions from this American. We can admire also the landscape, "Pond at Weston Green," by Geo. Davison. The reflection of trees on the water is delicate and soft. Heinrich Kühn's view of "Sommermittag" is a charming effect on rough paper, having all the force and breadth of a monochrome crayon drawing. Maurice Bucquet, of Paris, exhibits several admirable photographs, as "Eclaircie," "Marchande de Quatre Saisons." A fine, flat, monochome effect like a mezzotint is Alex. Keighley's "Evening on the Lune" (86). Karl Greger has a pleasing picture of "Essex Farm." H. P. Robinson sends a large photograph—a horse study, grey in tone. At the end of gallery is a study of sand hillocks, and a foreground of sandy beach, by George Davison, "Hayling Island" (146); "On the Isle of Purbeck," by Karl Greger (178). Portrait by Frank Eugene (181); "By the River" (197), a study of foreground, in which weeds, thistledown, and trees appear, is delightful in its effect and delicate tone. The landscape and trees in "After Rain" (206), by Alfred Horsley Hinton, are soft and effective, and we must notice here his view "In a Yorkshire Glen," a bold picture of a hillside slope, with large boulders and trees on its rugged surface (214); Charles Moss's "Harbour Bar" (225), a fine sunlight effect; Dr. Hugo Henneberg's "Reflections," and his "Study" of landscape (239); W. J. Warren's "Streansalch" (215) is another capital view. There is a portrait of W. Q. Orchardson, R.A., by J. Craig Annan, and one of a "Young Lady," by Dr. F. V. Spitzer. Many other subjects we are unable to find space for here by R. Démachy, A. Darnis, Mrs. Kasebier, Mrs. E. P. Cabot, Ralph W. Robinson, Albert Stevens, &c. Some of the effects are lamplight. Soft artistic effects and nice tone are the characteristics of this collection of photographs. The exhibition will be open from the 22nd inst. to Nov. 4.

GRAND HOTEL AND BRASSERIE DE L'EUROPE.

THE Grand Hotel and Brasserie de l'Europe, on the north side of Leicester-square, just completed by Messrs. Baker and Co., has been designed and conducted as nearly as possible upon the lines of the high-class Parisian Brasserie. For many years past it has been a constant source of complaint in the Press and elsewhere, that London enjoys so little of what is known as the café life of the Continent. Among other public writers, Mr. George R. Sims has frequently called attention to this want and regretted it. In Paris to-day the old-fashioned cafés and restaurants have largely given way to the better class of brasseries, and among these latter resorts there is none more popular than the Taverne Pousset on the Boulevard des Italiens. Those who know this cheerful, and, at the same time, economical house of retreshment, will have in their minds the style in which the new Brasserie in Leicester-square is to be conducted. In one word, Messrs. Baker and Co.'s latest enterprise will offer to the public a combination of the café-restaurant and the beer-hall on all fours with that type of brasserie which the experienced Parisian has found preferable to its many predecessors. In the basement is a large lager-beer hall, where, together with the finest brews from Munich, a number of German dishes and "delicatessen" will be served. Such dainties as caviare, Berliner rollmops (rolled herrings), Brunswick cervelat, Wiener and Frankfurter sauerkraut — all of which the Fatherland is wont to take with its beer—may here be asked for and obtained; and for the prepartion of these and all other German dishes a German cook will be responsible. The beers—an important item—come from the vats of the famous Pschorr Brauerei at Munich, and from the Bürgerliches Brauhaus, Pilsen; and those who consume the former will have the satisfaction of knowing that Prince Bismarck himself drank no other. The arrangements by which this beer will be drawn at a proper temperature are in every way complete. On the ground floor is the Grand Café, which, both in appearance and in style, will be found quite Continental, while above is the "Italian Room," which it is intended to use as an *à la carte* restaurant. Mesers. Baker and Co., in their desire to reproduce certain features of the French and German cafés, have by no means neglected the wants of those customers whose tastes are uncompromisingly English. Both in the Lager Beer Hall, and in the Grand Café, there will be an ample menu in the English style, so that the attractions of the "grill-room" will in no sense be absent from the new "Brasserie."

Mr. Walter Emden, J.P., L.C.C., P.S.A., is the architect of the building. The elevation shows a freely-treated design in granite, with pilasters of green, while the upper portion of the structure is in terracotta. A noticeable feature will be found in the projecting corners, surmounted with turrets, which are covered with gilt copper—an effect quite new to London. The ornamental portions of the terracotta are picked out in gold, and the granite pilasters are finished with bronze sags and ornaments. From basement to roof the building is of fireproof construction; but an additional precaution has been taken by the erection of an outside staircase from the top floors. The lager-beer hall in the basement is decorated in the Alhambra style, the walls being panelled out and filled in with mirrors, while the dado is of marble. The grand café on the ground floor is elaborately decorated in the style of the German Renaissance, the panels of the walls being filled in both with mirrors and with pictures representing events famous in German history. In this room a striking effect is obtained by hanging from the beams and columns festoons of leaves and flowers in repoussé copper, the fruit on these imposing garlands being represented by electric lamps. Generally speaking, the colouring of the decorations is similar to that of a German café, gold being largely used in the ornamental portions. On the first floor is the Italian Renaissance room, which will be used as an *à la carte* restaurant. The decoration of this room and much of the rest of the building, which throughout is very good, has been executed by Messrs. Goodall, Lamb, and Heighway, Ltd., of 16, John Dalton-street, Manchester. The panels on the walls are filled in alternately with silk and mirrors, and the general colouring is ivory white and gold. Columns and pilasters of Pavonazza marble and a dado of American maple are also features in the decoration of this apartment. A reception-room in the Louis XVI. style adjoins the Italian Renaissance room. In the upper portion of the building are the sitting-rooms and bedrooms of the hotel. These are all decorated and furnished in the most complete and modern manner. The main entrance of the hotel is in Leicester-place, and both the entrance-hall and staircase are decorated in the style of the German Renaissance. Pictures, illustrative of familiar German legends, here play an important part in the architect's scheme. The hotel is equipped with an elaborate lift by Messrs. Waygood and Co., Ltd., while the electric lighting and the sanitary arrangements are planned upon the most approved principles.



The builder is Mr. Alfred J. Bateman, of Ramsey, Hunts, who is to be congratulated on his work. We have never seen a more successful piece of underground construction than that which embraces the sub-basement, some 40ft. below the ground line—altogether an afterthought and involving a considerable amount of excavation and underpinning. For the ventilation Mr. Emden is responsible, but the combined result is really worth a visit from any architect. A wine-cellar with a temperature of 58°, and yet in close juxtaposition with the boiler system, is something on which architect and builder have a right to congratulate themselves.

We may also direct special attention to some remarkably good and well thought out domestic stained glass by Mr. T. F. Curtis (Messrs. Ward and Hughes), of Frith-street, Soho-square, on the staircase. We have seldom seen a more artistic success in this line. Readers who are familiar with the gaudy glitter of much of what, for want of a better term, we may call the "restaurant style," should really inspect this, which reflects the highest credit on the maker and on Mr. Emden. We shall give an illustration of the principal window, "The Nations of Europe being entertained as guests by Britannia," the week after next.

THE POSITION OF BOROUGH SURVEYOR.

ONE of the few interesting subjects discussed at the Sanitary Congress lately held at Southampton was on the position of the surveyor under County or other Councils, introduced by Mr. E. P. Hooley, the county surveyor of Notts, in his address to the Conference of Municipal Engineers and Surveyors. A good deal can be said on the qualifications and bearing of these officials. Their multifarious duties and their responsibilities are, perhaps, on the whole greater than those of any other professional class. They have not only to possess attainments of a high order, but they have to be expert and skilled enough to apply them on an emergency. Indeed, the measure of their success appears to be the amount of aptitude they have for applying their knowledge to any given purpose and at the shortest notice. Quickness of apprehension and of promptly bringing the resources of his mind to the attainment of any object is of more value to a public official than a mind stored with learning. We have often observed the most accomplished men have failed as men of action; that high professional attainments have not been the best equipment for a borough surveyor. His initiative is required in all public works. Few towns would have accomplished much in sewerage, schemes of disposal, of improvement, repaving, improved means of transit or traction, the building of artisan dwellings, and other similar matters had it not been for the enterprise and practical knowledge of their surveyors, who have by persistent efforts brought to bear on their committees these requirements. Mr. Hooley, in his address, dwelt on the prejudices the surveyor has to overcome, and the attacks to which he is exposed by partisan leaders. These are patent to all who have had any experience of official life in towns. The borough surveyor is exposed to a great many reproaches and insults; he is the target of all complaints. If there is any flooding in the lower levels of the town, he is held responsible; if the bill of extras for any scheme of sewerage work or sewage disposal is large, he is sure to be made the butt in the local press, for the general opinion is that if there is a surveyor paid a salary, he ought to be responsible for all "extras," forgetting that they have been ordered by the works committee, or have arisen from unforeseen circumstances. There is always a clique in the corporation that is ready to attack him, and to make him extremely uncomfortable, particularly if his election to the office has been independent of the votes of a large section, or he has won his official position by qualifications and testimonials that are above suspicion. No doub occasionally he may commit an error of judgment, and then he has to pay dearly.

There are many nice points in the conduct of a borough surveyor to which attention was not particularly drawn, and if any man needed a code of rules, that man is the public official of a corporation. Mr. Hooley's remarks did not touch on a few points of importance, one of which is the surveyor's relation to his professional brethren in the same town. This has often been strained. The surveyor has exercised the power conferred upon him by the Act in a rather arbitrary manner, or he has not that conciliatory mode of transacting business which is so necessary to avoid friction. This may be a defect of his manner or his temperament, but may be no good ground for charging him with partiality, prejudice, rough treatment in demanding deposit of plans for new buildings or compliance with local by-laws, and the like. These misunderstandings or prejudiced opinions are very irritating to some men, and cause a great deal of unnecessary friction in the conduct of business. Short-tempered men—men who have the habit of administering the law in a literal and perfunctory manner, without regard to local habits or the sympathies of other people, are the least suited for an office requiring so much forbearance and patient inquiry. Nor was there any direct allusion made to the rather difficult and delicate relations that subsist between the borough surveyor and professional architects. We all know what these are, and how often the situation is strained. Such, for example, is the surveyor's acceptance of architectural commissions in the town; for edifices like public offices, libraries, schools of art, markets, and public commercial buildings generally. Of course, this point raises the question of the propriety of allowing a borough surveyor private practice. When once this is conceded, it is impossible to urge objection to his undertaking any work of the kind. His salary may be ridiculously small, as Mr. Hooley has pointed out, and the surveyor has a perfect liberty to undertake other work that will bring him in an adequate income. But should this condition of matters remain? We think not. We question whether it subserves the best interest of a town for its surveyor to undertake architectural work in addition to his own engineering and surveying operations; and there can be no doubt the practice, where it exists—and we are glad to notice that in few important boroughs it does—has not been favourable to that good feeling which should prevail between the profession and the public official. We do not say anything here of the architectural question: that is another matter, but it seems to us great friction would be avoided if corporations paid their surveyors adequately, so that they might be rendered quite independent of private practice. Where public buildings like municipal offices and municipal lodging-houses are concerned, it would be better if corporations sought for outside professional advice, and obtained designs from men independent of local politics. The question of the dismissal of the surveyor is one which ought to be placed on another footing, and we think most of our readers will endorse the spirit of the resolution submitted by Mr. Alderman Lemon before the Conference of Engineers and Surveyors, protesting against the summary dismissal of the well-known and widely-respected borough surveyor of West Ham.

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WAYSIDE SKETCHES IN SUFFOLK.

THE curious old chapel to the almshouses of Hadleigh is all that is left of the original buildings, the almshouses themselves having been rebuilt some years back. Standing some feet above the road, with its quaint, cross-surmounted bell turret, tiled roof, and walls partly brick nogging and partly stick and plaster, it has a very picturesque effect, and is well worth a visit.

Stoke-by-Nayland church tower is very finely proportioned, with a massiveness in construction seldom seen in brick towers. The panelling and finials, as well as all angle dressings, are in stone. The great thickness of the walls has been taken advantage of by giving the windows deep splayed reveals, which has a bold effect, and, standing on rising ground, the tower is a landmark for miles around.

The entrance-lodge to Long Melford Hall is of the same date as the fine old mansion the residence of Lady Parker. It is well situated facing the village green, with a heavy bank of trees as background.*

Lavenham porch needs little explanation. Like the whole of this famous Suffolk church, it is elaborately carved and panelled in snap flintwork. The interior is finished off with a richly vaulted and panelled ceiling, springing from columns at each corner of the porch. The front panels outside over the entrance are filled with the coats-of-arms of various great families at whose expense the church was built.

The old parish chest at Hadleigh Church was evidently made more for practical use and safety than an ornamental addition to the church. Should the prospective thief be successful in disposing of the three original padlocks, he would have to be a fairly strong man to lift the lid, composed of a length of half a trunk of a fair-sized English oak. Leonard Crowfoot.

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The Sunderland Corporation have, with but one dissentient, adopted a report from the joint Bridge and Ferries and Highways Committee, recommending the promotion of a Bill by the council in the ensuing session of Parliament for the erection of a bridge over the Wear between Deptford and Southwick at an estimated cost of £130,000, and for the inclusion of Southwick and Fulwell in the borough of Sunderland.

OBITUARY.

Mr. William Willmer Pocock, B.A., F.R.I.B.A., who died at his residence, Glendore, Tunbridge Wells, on Monday, in his 86th year, was the son of an architect and, at the time of his death, the "father" of the Royal Institute of British Architects. He was best known as the architect of the late Rev. C. H. Spurgeon's Tabernacle in Newington Butts, destroyed by fire on April 20, 1898, and it is of interest to note that immediately on hearing of the disaster, Mr. Pocock wrote to the Rev. Thomas Spurgeon, offering the use of the original drawings and specification for the purposes of renovation. He also designed several other public buildings, the last being the hall of the Carpenters' Company in Throgmorton-avenue, of which company he was a Past-Master. He was educated at King's College, where he received the honour of A.K.C., and subsequently passed the B.A. examination in the London University. He won the medal of the Institute of Architects awarded for essays so far back as 1838, having joined that body as an Associate the previous year, and in 1846 he was advanced to the rank of Fellow. Throughout his long life he took a lively interest in all that pertained to the interests of the Wesleyan Church, and was a generous supporter of its Connexional funds. In his later years he laboured strenuously to improve the status of the lay preachers, and devoted large sums in providing local preachers with wholesome literature. He was a representative to the Conference, and served on nearly all the Connexional committees. A Methodist of the old school, he was strongly opposed to all modern innovations. He twice contested Guildford in the Liberal interest, but since the Home Rule split had been a Unionist in politics. The memorial service will be held at the Wesleyan Church, St. John's Hill, Clapham Junction, this (Friday) afternoon at 3 o'clock, and the interment will take place at Wandsworth Cemetery three-quarters of an hour later.

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Mr. William Stiff, of the Laurels, Clapham Common, and of the firm of James Stiff and Sons, of the London Pottery, Lambeth, stoneware manufacturer, who died on July 19 last, aged 62 years, left an estate which has been valued at £45,464 13s. 6d. gross, including personalty of the net value of £11,416 5s. 2d. The testator bequeathed to his wife £200, the use and enjoyment of his residence, and an annuity of £600 during her widowhood, which in the event of her remarriage is to be reduced to £300; to his son Sydney James, £400 and the goodwill of the business carried on by the testator; to James Baxter, George Walter Wilkin, and James Skeen, employees at the testator's firm, £100 each; to Alfred Mitchell, £50; to Miss Sarah Hall, £100; and to the Rev. Wm. Williams, of Lambeth, £50. The late Mr. Stiff left his residuary estate as to one half in equal shares for his sons, Horace William and Alfred Thomas, and as to the other moiety in equal shares for his daughters, Ethel May, Hilda Sarah, Mary Helena, and Eleanor Winifred Stiff.

The Local Government Board have sanctioned a loan of £13,700 to be devoted for the erection of the new public baths in Union-street, Chester. The original tender of Mr. W. W. Freeman, of Chester, accepted by the committee in May last, amounted to £11,600; but owing to the increase in price of building materials, it was found that an additional £230 would be required, bringing the amount of the contract up to £11,830. The total estimated cost of the scheme is therefore now £13,930. Mr. Freeman's contract has been signed, and the baths will be constructed as soon as possible.

Preparations are being made for the erection of a memorial statue representing an angel with outstretched wings, presented to the town of Rochdale by Miss Mackinnon. This week men have been at work taking up the flagging on the site, which is opposite the Presbyterian Church. Messrs. W. A. Peters and Son have undertaken the work of erecting the memorial. A foundation of concrete has been laid by corporation workmen, and the base stone is ready for insertion. The statue, which is at present in the corporation stoneyard, is a white marble one, the work of Mr. F. J. Williamson, of Esher.

The North-Eastern Railway Company have started this week their new East Durham coast line from Hartlepool to Seaham Harbour. From the latter place running powers will be exercised over the Marquis of Londonderry's railway to Sunderland, and thence the route will be by North-Eastern main line to the Tyneside. Traffic from the collieries now being sunk at Easington and Seaham Harbour will be provided for by sidings. The principal stations on the new railway will be Seaham Harbour and Hartlepool.

PROFESSIONAL AND TRADE SOCIETIES.

The Society of Architects.—The following are the nominatins for officers and council for the ensuing session of the Society, an asterisk denoting fresh blood:—President, T. Walter L. Emden, J.P., L.C.C.; vice-presidents, Lieut.-Col. F. Seymour-Leslie, R.E., of Exeter, and Silvanus Trevail, J.P., F.R.I.B.A., of Truro; members of council: James Bartlett, C. A. Bassett-Smith, Geo. E. Bond (Rochester), W. Cooper (Hastings), James Williams *Dunford, J. W. *Fraser, A.R.I.B.A. (Newcastle-on-Tyne), H. J. Jones (Bristol), W. R. *Mallett, R. Lano Pearce, G. Gard Pye, J. R. Richards, and R. Frank Vallance, F.R.I.B.A. (Mansfield); hon. secretary, Ellis Marsland; hon. corres. secretary, Edgar Farman; hon. treasurer, H. O. Quartermain. Under Rule 34, additional nominations for council and officers may be made by any three members, who must send in their nominations, properly signed, to the council before the first day of October, and the names of such nominees will be incorporated with the list proposed by the council, which is to be arranged alphabetically.

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CHIPS.

A new institute, the Soldiers' Victoria Hall, recently erected on the Western Heights at Dover, was formally opened on the 15th inst. by Mr. Geo. Wyndham. The building comprises reading and recreation rooms, a devotional room known as the Gordon Room, kitchen and offices, caretaker's quarters, lavatories, &c., and has been built at a cost of about £2,200. The building was designed and superintended by Mr. W. Beeston, architect, Dover.

Alterations have been made at the assembly-rooms, South Molton, from the designs of Mr. W. Champion, the borough surveyor, and special consideration has been given to the ventilation, which is carried out on the Boyle system.

At the Guildhall Police-court, on Wednesday, Alfred Melhuish, 34, of New-cross, who had been cashier to Mr. Hobson, an estate agent, of Coleman-street, was sentenced to six months' hard labour for embezzling his employer's money. It was stated that his defalcations amounted to between £400 and £500.

The lych-gate, erected by the Queen at Dovercourt parish church will be opened to-day (Friday). The church has now been thoroughly restored, and stained glass is placed in every window except two. One of these will be filled shortly (and, in fact, is expected every day from Munich), by the German Emperor in memory of one or two men of the German Legion who died at Dovercourt after the Walcheren Expedition and were buried in the churchyard. The Queen's lych-gate is to the memory of British soldiers. It is built entirely of English oak, and is carved and very massive. It was designed by Messrs. J. E. K. and J. P. Cutts, of London, and executed by Mr. Edward Saunders, of Dovercourt.

The Lerwick Burgh Commissioners have under consideration a report by Mr. Yorke, electrical engineer, Glasgow, as to the proposed introduction of electric light into Lerwick. The actual cost of the undertaking is estimated at £9,260.

Mr. J. C. Cartwright, borough surveyor at Bury, has resigned after serving the corporation 22½ years. At the last meeting of the town council, Colonel Walker (deputy mayor) was glad to say that Mr. Cartwright, who was deservedly regarded as a most honourable and trustworthy public servant, would still retain his connection with the corporation as their consulting engineer.

The handsomely-carved oak pulpit, removed from Curzon-street Chapel, Mayfair, and presented by Earl Howe to the 14th-century parish church at Penn, Bucks, was dedicated in its new home at a special service on Thursday.

The installation has just been completed of the electric light in the Tron Church, Edinburgh. At the same time the church and seats have undergone cleaning, repainting, and varnishing; the organ has been enlarged and overhauled by Messrs. Ingram, and electric blowing apparatus is to be introduced. A stained-glass window has also been inserted, in memory of the late Dr. Simson, for many years an elder in the Tron. The subject is from the life of Elijah, and the work was executed by Messrs. Ballantine and Gardiner, 42, George-street, Edinburgh.

The unveiling of the Cromwell statue at Westminster will take place on Tuesday, October 31. Preparations are being made for a national demonstration the same evening. Lord Rosebery has consented to speak, and will, it is anticipated, deliver a speech on the life and work of the great Protector.

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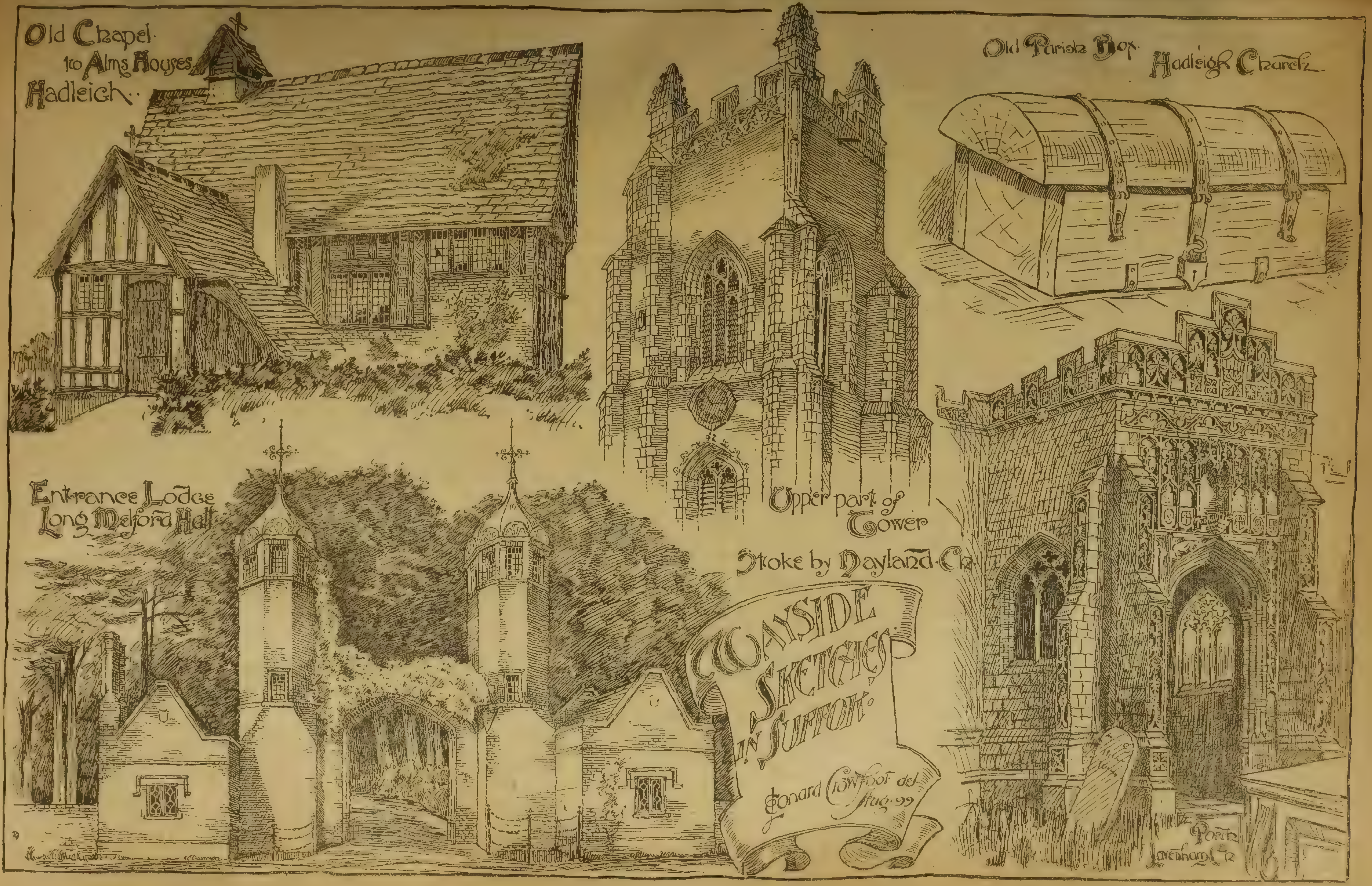
* We gave another view of this building, sketched by Mr. Maurice B. Adams, Dec. 4, 1885.


Old Chapel to Alms Houses Hadleigh.
Old Parish Box. Hadleigh Church
Upper part of Tower
Stoke by Nayland Ch
Entrance Lodge Long Melford Hall
Wayside Sketches in Suffolk.
Leonard Crowfoot del. Aug. 99
Porch Lavenham Ch

Building Intelligence.

Aberdeen.—At a meeting of the University Court, on Tuesday, the Marquis of Huntly, Lord Rector, presiding, a report by Mr. A. Marshall Mackenzie, A.R.S.A., with reference to the extension of Aberdeen University, was submitted. The cost of what is called the popular plan, with Greyfriars' Church erected at Queen-street, he estimates at £45,000; the modified popular plan, with the church on the Parliamentary site, at £40,000; restoration scheme, £27,000; and south extension, with rebuilding of Greyfriars' in front of Mitchell Tower, £32,000. After discussion, the Court came to a finding that any one of the plans would afford sufficient accommodation for the present wants of the University, and agreeing to submit plans and architect's report to the Joint Committee of the University Court for their information. A meeting of the joint committee was fixed for that purpose.

Balham, S.W.—The commemoration-stone of the Royal Duchess Theatre, which has been for some time past in course of construction at the foot of Balham-hill, was formally laid by Mr. Charles Wyndham on Saturday. The theatre, which has been built from designs by Mr. W. G. R. Sprague, has cost over £35,000. Constructed entirely of stone in the Italian Renaissance style, it is crowned by a copper dome, surmounted by an upper colonnade—110ft. above the pavement level—and cupola. The French Renaissance has supplied the fashion for the interior decorations and furniture. The auditorium is on the two-tier system, there are installations of both electricity and gas, the theatre is heated by low-pressure hot-water pipes, and provision is made against fire or fire alarms, whilst there is good accommodation for the artists. Accommodation is provided for an audience of 2,500 persons. A new device is the provision in the auditorium of a grand organ. The keyboard is on the O.P. side of the orchestra; but the 240 pipes are hidden within certain portions of the decorations. The instrument is built on the tubular pneumatic system, and its power is equal to that of a hundred individual performers.

Belfast.—Progress is being made with the new Protestant cathedral, the foundation-stone of which was laid on the 6th inst. by the Countess of Shaftesbury. The architect is Mr. Thomas Drew, R.H.A., F.R.I.B.A., of Dublin, a native of Belfast, acting in conjunction with Mr. W. H. Lynn, R.H.A., of Belfast. The original proposal was to adopt the Gothic style for the building, and in 1896 Mr. Drew submitted a design of this type; but owing to the limited area of the site and the lack of funds, the committee adopted a Byzantine treatment on the recommendation of Messrs. Drew and Lynn. A conspicuous feature of the completed church will be a west front in Donegall-street, which, however, will not be built at present, except in part. The nave and aisles will accommodate about 2,000 people, and the completed cathedral about 3,000. A contract for the erection of the first portion of the building has been entered into with Messrs. Laverty and Sons at a cost of £19,384, and the estimated total cost of the completed cathedral is £70,000, including a central dome or tower, with the belfry to contain the peal of bells costing £2,000, which Mr. W. Gibson, of the firm of Messrs. Gitson and Co., Limited, has offered to present. The plan shows a nave 40ft. and 121ft. in clear length, divided from north and south aisles of 20ft. span by circular shafts into six bays, and a crossing, transepts, and chancel each with their piers and square of 40ft. The internal height of the aisle walls is 36ft., and of the nave and its clerestory 72ft. The treatment is round arched Romanesque, of the type seen in the South of France. Eventually the crossing is to be covered in by a great dome or central tower. The west façade will have a lofty central portal inclosed in a receding series of arches five in number. The main gable and its staircase turrets will rise to a height of 105ft.

St. Pancras.—The Baths Committee reported, at a meeting of the St. Pancras Vestry on Wednesday, that in a few days the architect would submit the working drawings for the new baths, which are estimated to cost nearly £60,000, and that they had considered the question of appointing a surveyor for taking out the quantities. They had instructed that an advertisement should be issued inviting surveyors to send in applications, and to state the remuneration they would require. The committee added that preference would be given to those quantity surveyors who had had previous experience in that class of work in so far as baths were concerned. The vestry approved the action taken.

CHIPS.

The erection of a new reredos at St. Margaret's Church, King's Lynn, was commenced last week. The plans, which were approved by the vestry a year ago, are by Mr. G. F. Bodley, A.R.A. The cost will be defrayed by a legacy of £1,000.

At the last session of the Glasgow Dean of Guild Court, it was reported that the Evangelical Union Church in West-street, Calton, is in a dangerous state, and, on the recommendation of Mr. Matthew Henderson, the court made an order that the roof should be taken off, the east wall taken down, and the other parts of the building shored and barricaded.

Mr. Goscombe John, A.R A., of St. John's-wood, London, to whom the commission for the monument to be erected to the late Daniel Owen, of Mold, the well-known Welsh novelist, has been intrusted, has completed his clay model of the memorial. The statue is to be a bronze one.

Birmingham and South Staffordshire merchants have just received orders from the agents of American building contractors for the supply of large quantities of steel bars of high quality for fireproof floors and general building construction. The orders are conditional upon prompt shipment to the United States, the steel manufacturers in that country being utterly unable to cope with the immense contracts which they have received. American prices have advanced far beyond the English level, and contractors in this country who formerly used American steel are now buying English bars for constructive purposes.

At Harpenden, Herts, the old British Schools, which were leased to the urban district council at a nominal rent, have been transformed into public offices. Messrs. J. R. Brown and Son, of Luton and Harpenden, were the architects, and Mr. C. Tomlin was the builder. The public hall is 46ft. by 37ft., and 22ft. in height, and the council chamber is 24ft. by 14ft. The outlay on the alterations was £650.

Mr. W. Santo Crimp, M.Inst.C.E., of Great George-street, Westminster, is expected to arrive in Bombay on Sunday next, the 24th inst, to report to the municipality on the long-pending question of lowering the subsoil water in Bombay.

The result of the vote taken amongst the Tees and Tyne shipyard joiners as to whether they should apply for an advance of wages shows a majority against any steps being taken to do so at the present time.

The new pier at Herne Bay was formally opened on Thursday afternoon in last week. The new pier is built of steel and iron, and has a length of 3,920ft. and a uniform breadth of 20ft., broadening out at the bays to 30ft. A pavilion, which has been erected at the shore end for concerts, will accommodate over 600 people. The pier has been designed by Mr. Ewing Mathieson, C.E., of Walbrook, and was built by Messrs. Head, Wrightson, and Co., Ltd., of Victoria-street, S.W., and Thornaby-on-Tees. Messrs. Perry and Co., of Tredegar Works, Bow, were responsible for the building of the refreshment-room at the pierhead. The Val-de-Travers Asphalte Company, Ltd., covered the roof of the refreshment-room, so as to enable it to be used as a promenade.

The plans of M. Bernard, of Paris, for the new buildings of the University of California, estimated to cost between 7,000,000dols. and 8,000,000dols., are reported to have been accepted by the Board of Regents.

The corporation of Newcastle have adopted a report by Professor Hopkinson, recommending the adoption of electric traction on the tramways in that city, and have instructed Messrs. Oliver, Leeson, and Wood to prepare plans for the erection of a car-shed to accommodate 90 cars at Bykerhill.

The spacious vestibule of St. Lawrence Jewry has just undergone renovation. The disfiguring cupboards and matchboarding wainscot have been removed, and the lower portions of the walls thus exposed are to be finished in smooth stonework. The upper portions of the walls have been painted and distempered. The monuments from St. Michael, Bassishaw, are affixed to the walls, and include the tablet to Dr. Wharton, whose bravery during the Plague of 1665 has secured him a lasting memorial. The altar-piece from St. Michael's, consisting of a figure of Jesus Christ, painted in 1845, has been hung on the north wall, facing the Gresham-street entrance. A carved panel, also from St. Michael's, has been placed on the west wall, and is intended to receive a clock.

Engineering Notes.

Luton.—Last Sunday saw the formal opening of the double line working from the Great Northern station at Luton to the new signal box at the far end of Messrs. H. Brown and Son's timber yard—a step towards the double line between Hatfield and Dunstable, this portion constituting the only expensive length of the whole branch. The work of widening has been in progress in Luton for a considerable time, and has effected a great improvement in some of the streets, and in Dunstable and Bedford-roads, the new bridges, although carrying more lines of metal, being widened in order to make the footpaths underneath, which before were very narrow, of a corresponding width to the approaches thereto. The bridge over Guildford-street is now the widest in the town, five lines of metals being laid down at that point. The work altogether has cost about £100,000, the first contract being for £80,000.

Stockwell, S.E.—Extensive additions are now being made to the generating plant of the City and South London Electric Railway at Stockwell. This line, the pioneer of the deep-tunnel railways, was originally intended for cable traction, but before the constructional work was finished, the engineers decided to adopt the electrical system of working. The line was accordingly equipped before the opening day, with electrical plant constructed by Messrs. Mather and Platt, of Munster. Consequent on the approaching extension northwards and southwards to Moorgate-street and Clapham Common respectively, a new generating station is being constructed next the old one near the junction of the Stockwell and Clapham roads, to the designs and specifications of Mr. P. V. Macmahon, the company's engineer. The generating plant consists of six sets of steam dynamos, there being two compound Willans engines driving 150-kilowatt generators, and two horizontal engines constructed by Messrs. Cole, Marchant, and Morley, of Bradford, each of which drives a 600-kilowatt dynamo. All the dynamos mentioned have been supplied by the Electric Construction Company, Limited, of Wolverhampton. The boilers, nine in number, have been built by Messrs. Davey, Paxman, and Co., of Colchester. New sheds and a lofty circular chimney shaft of brickwork have been erected.

The highways committee of the Leeds Corporation have accepted tenders for paving and flagging thirteen new streets. This brings up the total number of new streets under process of paving, or under consideration in that city, to ninety-eight.

The urban district council of Withington have agreed to ask the Local Government Board to sanction a scheme of sewerage which, it is estimated, will cost £86,000.

The new commercial harbour at Dover has been partly completed by Sir John Jackson, Ltd., within twelve months of the time allowed (six years), and the easterly arm, consisting throughout the greater part of its length of a powerful granite and concrete breakwater, will shortly be opened as a public promenade. The creation of the commercial harbour will be completed by the extension of the Admiralty Pier 2,000ft. in an easterly direction.

At the Central Criminal Court, on Tuesday, before the Recorder, William Henry Duncan (on bail), an engineer, who pleaded guilty to an indictment charging him with having offered a sum of money to Edgar Josiah Harper, an officer of the London County Council, as an inducement for him to do something in respect of a matter affecting the said Council, was brought up for sentence. The Recorder sentenced Duncan to two months' imprisonment in the second class.

Lord Rosebery will visit Cheltenham at the end of October to open the new Municipal Art Gallery which has been erected as a memorial of the Queen's reign, and presented to the town by Baron de Ferrières, who formerly represented the borough in the House of Commons. The Baron has stipulated that one of the galleries shall be reserved for thirty-five works by old and modern masters now included in his own collection, and which he has announced his intention of giving to the town.

Colonel W. Langton Coke, M.I.C.E., and Dr. S. W. Wheaton held an inquiry at the Public Offices, Egremont, on Tuesday, on behalf of the Local Government Board respecting applications by the Wallasey District Council to borrow £18,500 for purposes of electric traction, £6,400 for land for works depot, and £2,630 for the extension of the infectious hospital.

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ILLUSTRATIONS.

THE PASSMORE EDWARDS ORPHANAGE FOR THE NATIONAL TEACHERS' UNION. — A ROYAL MAUSOLEUM. — PUGIN STUDENTSHIP DRAWINGS.—BUILDINGS IN CARR'S LANE, BIRMINGHAM. — FROME SCIENCE AND ART SCHOOL. — THE DRIVE, KERSAL, NEAR MANCHESTER.—WAYSIDE SKETCHES IN SUFFOLK: — "CLAYPATCH," ENFIELD. — LEIGH FRIENDLY CO-OPERATIVE SOCIETY'S PREMISES.

Our Illustrations.

WESTWOOD HOUSE, SYDENHAM: THE PASSMORE EDWARDS ORPHANAGE FOR THE NATIONAL TEACHERS' UNION.

This beautiful mansion was erected from the designs of the late J. L. Pearson, R.A., twenty years ago. To-morrow it will be opened by the donor, Mr. J. Passmore Edwards, as an orphanage for the National Teachers' Union, the buildings and lovely grounds forming the property having been purchased by the Teachers' Union through the liberality of Mr. Edwards. The interior is elaborately fitted-up in mahogany and hard woods, the great feature of the house being the grand music saloons added to the west side of the mansion since the view herewith given of the garden front, from the pen of Mr. A. Haig, was made. This saloon has a minstrel's gallery in it, the whole of the detail being of the richest description. The principal staircase is ornamented by sculptured figures on the newels. The doors of the chief apartments are in mahogany, delicately detailed. Externally, the work is in red brickwork, with carved panels and gables. The winter gardens, with their domical roofs, form a great feature in the composition, and the garden terraces add much to its dignity. The stable wing is marked by the belfry tower seen in the view. Besides a new system of drainage and some works of adaptation and repair, little has been done, but during the past few months the place has been in the hands of the builders. The entrance-front is approached by an avenue, and the portal is flanked by two round pavilions of elaborate design. The perspective view, reproduced to-day by the courtesy of Mr. Frank Pearson, was shown in the Academy in 1880.

DESIGN FOR A ROYAL MAUSOLEUM.

This design was submitted last year in the Tite Prize Competition. This studentship, worth £30, which is to be devoted to travel and study in Italy, is offered annually by the Royal Institute of British Architects for the best design for some subject in Classic style. The plan of the design we illustrate is the shape of a Greek cross, the north and south wings serving as memorial chapels, the east and west as chancel and entrance respectively. The vaults are immediately beneath the ground floor. Some effect has been gained by placing the building on the side of a hill, the entrance being reached by flights of steps. Mr. Charles E. Varndell is the author of the design.

PUGIN STUDENTSHIP DRAWINGS.

We give this week a sheet of drawings, by Mr. Hervey Rutherford, for which the Pugin Studentship was awarded this year. They comprise a fresco, illustrating "St. Michael and the Last Judgment," from the south aisle of the nave of South Leigh Church, near Oxford; some crisp 13th-century carvings of foliage, from capitals in York Cathedral; and some ironwork from Micklegate Hill House, in the same city, and several spandrels and finials from the wall arcading in the Lady Chapel of Ely Cathedral—work, but slightly later than the days of Alan de Walsingham, that moved Augustus Welby Pugin to tears when he first saw it, and noted the manner in which the exquisite details had been destroyed by the soldiers of the Commonwealth. In our issue of the 25th ult. we gave a double page of sketches in Ely Cathedral by Mr. George Marples, including the upper portion of a bay of this arcading, and we then published a list of the illustrations of the minster at Ely, over a score in number, that have appeared in our pages.

BUILDINGS OVER CARR'S LANE TUNNEL, BIRMINGHAM.

We publish this week a drawing of a warehouse in Carr's-lane, Birmingham, erected under most unusual, if not unique, circumstances. The site is traversed in the front by the Great Western Railway tunnel, which cuts into the frontage 4ft. at one end and 25ft. at the other. The depth of the tunnel below the top of the street paving does not exceed 3ft. in any one part, and is generally considerably less. The chief engineer of the Railway Company, Mr. James Inglis, would not permit any weight to rest upon the tunnel, and the depth precluded the use of cross girders. It became necessary, therefore, to devise a system of steel cantilevers, varying in depth from 9ft. downwards, with masses of concrete and anchor plates at the ends of the two largest of them. The upper and lower flanges of the cantilever at the end next the spectator consists of three $\frac{5}{8}$in. plates, dropping off to one at the back, and the webs are $\frac{5}{8}$in. thick. The cantilever is of box section, 3ft. 6in. wide, with stiffeners, gussets, &c., rests on a block of granite 2ft. thick, and has two 9in. by $\frac{7}{8}$in. steel holding-down bars with anchor plates 5ft. by 3ft. 6in. built up with steel angles, and fixed into a load of concrete 16ft. by 15ft. by 8ft. The total length of this cantilever is 54ft. 3in. The stonework is fixed on the front of the cantilever by means of angle, irons and iron dowels. The buildings were erected for Messrs. J. and J. Pattison and Messrs. E. Holroyd and Co., of Birmingham, the builder being Mr. E. J. Charles, of Moseley, and the whole undertaking was carried out from the designs and under the superintendence of Mr. Ralph Heaton, architect, of Birmingham.

FROME SCIENCE AND ART SCHOOL.

The accompanying view of a design for the above, which we this week illustrate, shows the scheme which was awarded the second premium in the recent competition. The materials proposed are hammer-dressed local stone backed with brick, and Bath stone dressings for the walling, and green slates for the roof. The plans explain the arrangements adopted. The estimated cost was £2,174, and the author of the design is Mr. Robert E. Brinkworth, F.S.I., of Chippenham, Wilts.

THE DRIVE, KERSAL, NEAR MANCHESTER.

This group of two detached and four semi-detached houses has recently been erected for Mr. Richard Hankinson, from plans by and under the superintendence of Messrs. Ogden and Little, A.R.I.B.A., Cross-street, Manchester. The walls are faced with Ruabon bricks, with half-timber work in the gables. The roofs are slated. Mr. Robert Holland, of Higher Broughton, was the contractor. The plans given show the arrangement of all the houses, which in this respect are repeats in the main.

LEIGH FRIENDLY CO-OPERATIVE SOCIETY'S PREMISES.

We give herewith an exterior view of the new premises for the Leigh Friendly Co-operative Society at Leigh, Lancashire. The building, which is well arranged, provides the usual accommodation for the various departments of an extensive co-operative business. The architect is Mr. J. C. Prestwich, of Leigh, Lancashire.

* * *

Messrs. E. H. Shorland and Brother, of Manchester, have just supplied their patent Manchester grates to the Convent, Norwich.

COMPETITIONS.

Lichfield.—At the last meeting of the Conduit Lands Trust, held at the Guildhall, the dean, as chairman of the board of governors of the grammar school, attended and explained that the plans of Mr. T. H. Pyke, architect, of London, had been accepted for the erection of a new grammar school, on a site in Upper St. John-street, and that a total sum of £5,000 was required. After hearing the explanations of the dean, the trustees resolved to increase their offer towards the undertaking of £1,500 to £3,000.

Ramsgate.—In our notice last week, p. 331, of the awards of premiums in the competition for a concert hall to be built on the Paragon Gardens, West Cliff, Messrs. A. Ardron and Bruce Dawson, of Old Queen-street, Westminster, point out that the name of Mr. A. Howell should have been conjoined with that of their firm as having been placed first. We gave the information as received by us, and regret the omission by our correspondent.

* * *

CHIPS.

The extensive factory of the Quarry Hill Brick Company at Tonbridge caught fire at five a.m. on Sunday week, and in less than an hour the whole building was a total wreck. Owing to want of water the local fire brigade was unable to render any assistance. A large quantity of valuable machinery was destroyed. The whole of the employés are thrown out of work.

The Agent-General for Western Australia has been informed that a report is in circulation that the Government of the colony have been unable to construct the Mundaring reservoir owing to engineering difficulties, and, in consequence, have decided to abandon the Coolgardie water scheme. He contradicts this statement, and adds that his latest advices informed him that the foundations of the reservoir are quite satisfactory, and the work of cementing would proceed quickly; that the first pipes would soon be delivered, and the undertaking be pushed on as rapidly as possible.

The parks committee of Aberdeen Town Council have selected a space in the ornamental plot in front of the Art Gallery as a site for the memorial to be erected in Aberdeen by the officers and men of the 1st Battalion Gordon Highlanders in memory of their comrades who fell in the North-west frontier campaign in India. The memorial, which is being prepared by Messrs. Henderson and Webster, sculptors, Affleck-street, is to take the form of a triangular granite shaft, on the top of which will be a bronze figure of Victory, the total height being 16ft. It is intended to unveil the memorial on October 3.

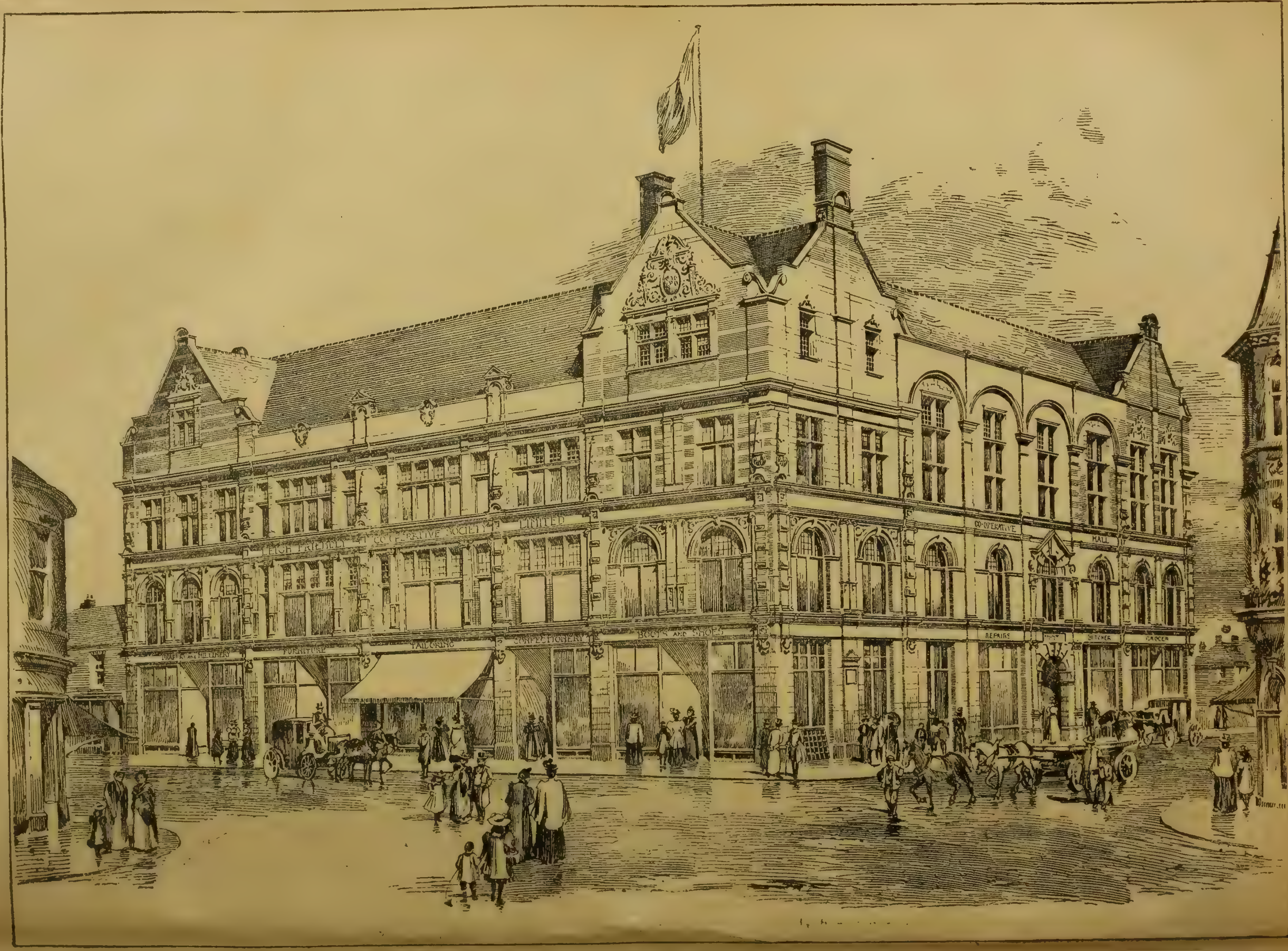
Plans of alterations which it is proposed to be made to Stonehaven Railway Station have been prepared by Mr. T. M. Barr, engineer of the Northern Section of the Caledonian Railway at Perth, and tenders are being invited for the work. The cost of alteration and extension is £6,000. The platforms are to be widened, heightened, and laid with concrete, and the stone bridge at the end of the station will be girdered in order to allow of an addition to the station of several feet to the south. A verandah will be erected over one platform, and new waiting-rooms will replace the present structure on the down platform.

Lord Muncaster will open the Nelson School at Wigton on the same day as the opening ceremony of the Wigton Thomlinson Grammar School for girls will be performed by Mrs. J. W. Lowther, wife of the Deputy-Speaker. The Nelson School is a high school for boys, founded and endowed with £28,000, apportioned out of the money (amounting to over £40,000) left for disposal by the late Mr. Jos. Nelson, of Moor-row.

A stained-glass window has recently been placed in the parish church at West Wickham, in memory of the members of the Stewart family. It represents St. Michael and St. George.

At the last meeting of the vestry of Rotherhithe, the sanitary committee submitted the draft order of the Local Government Board, sanctioning, with modifications, the Fulford-street and Braddon-street improvements scheme. The order provided for the erection of dwelling-houses upon the site for the accommodation of 550 persons. One-half of the ground might be cleared, and until accommodation had been provided for 275 families, the other half of the area was not to be cleared, if the ground was not dealt with in the course of twelve months. The report was adopted.

A Local Government Board inquiry was held at Epsom on Wednesday into the application of the urban district council to borrow £16,100 for electric lighting purposes. The Local Government Board have already sanctioned the borrowing of £2,500 for a site for the proposed works.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BOOTS AND SHOES
REPAIRS
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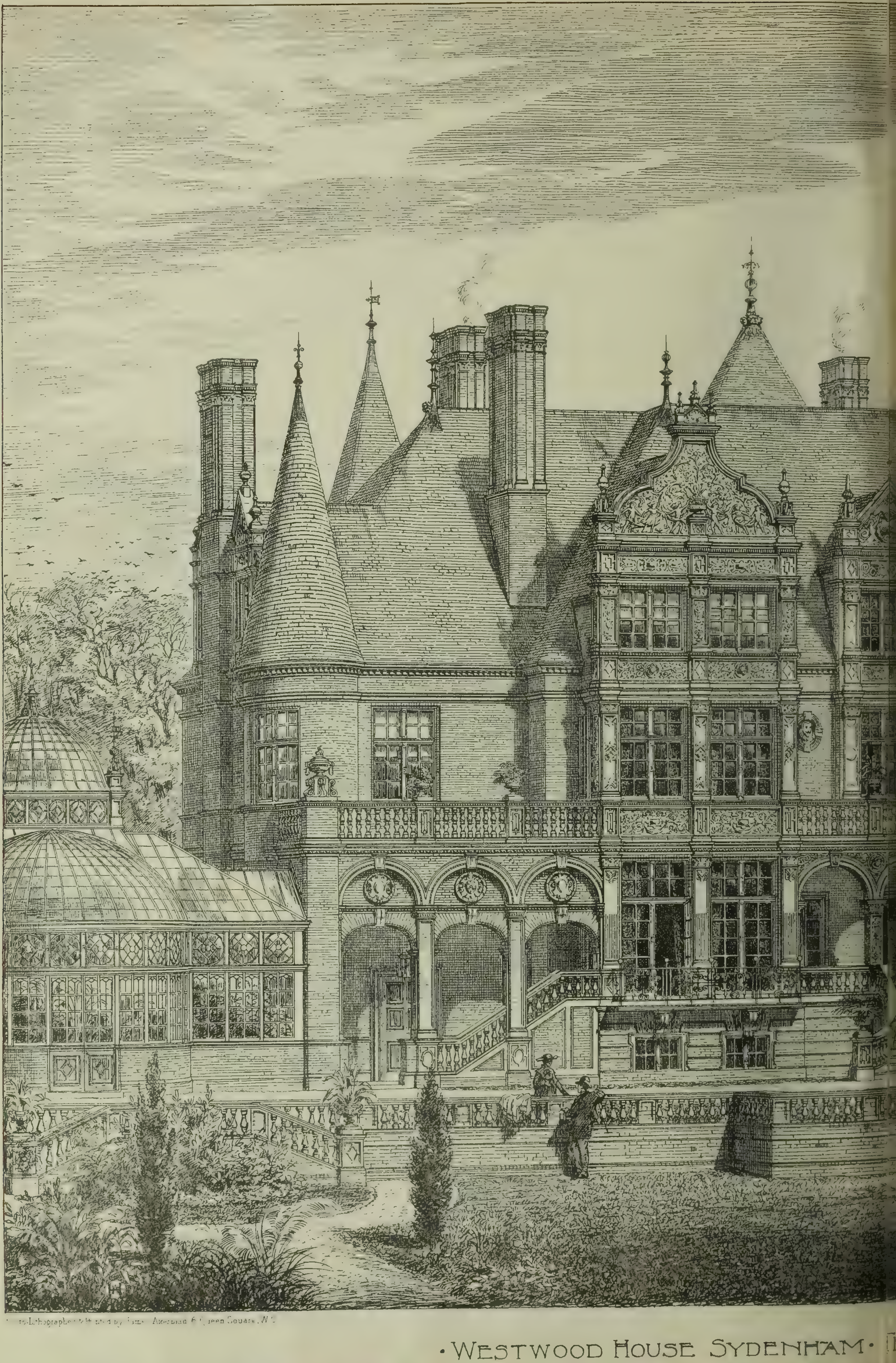

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· WESTWOOD HOUSE SYDENHAM ·

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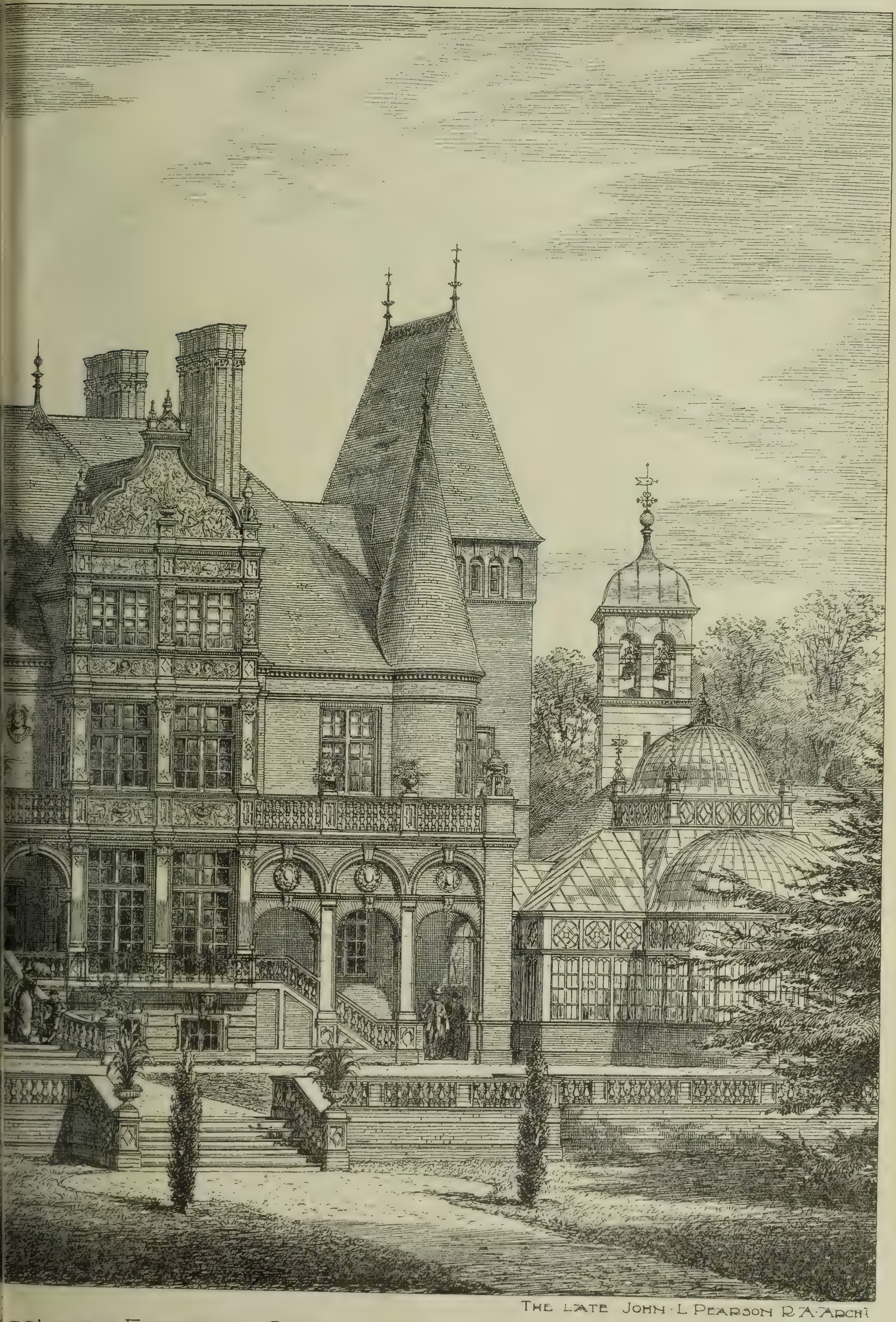

THE LATE JOHN · L PEARSON R·A· ARCHT

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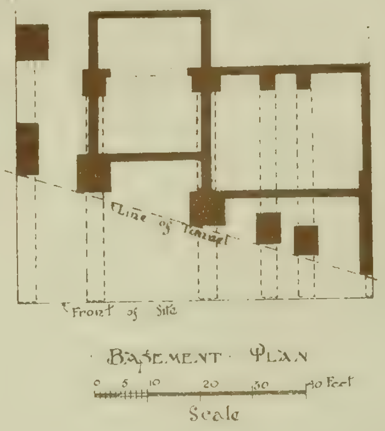
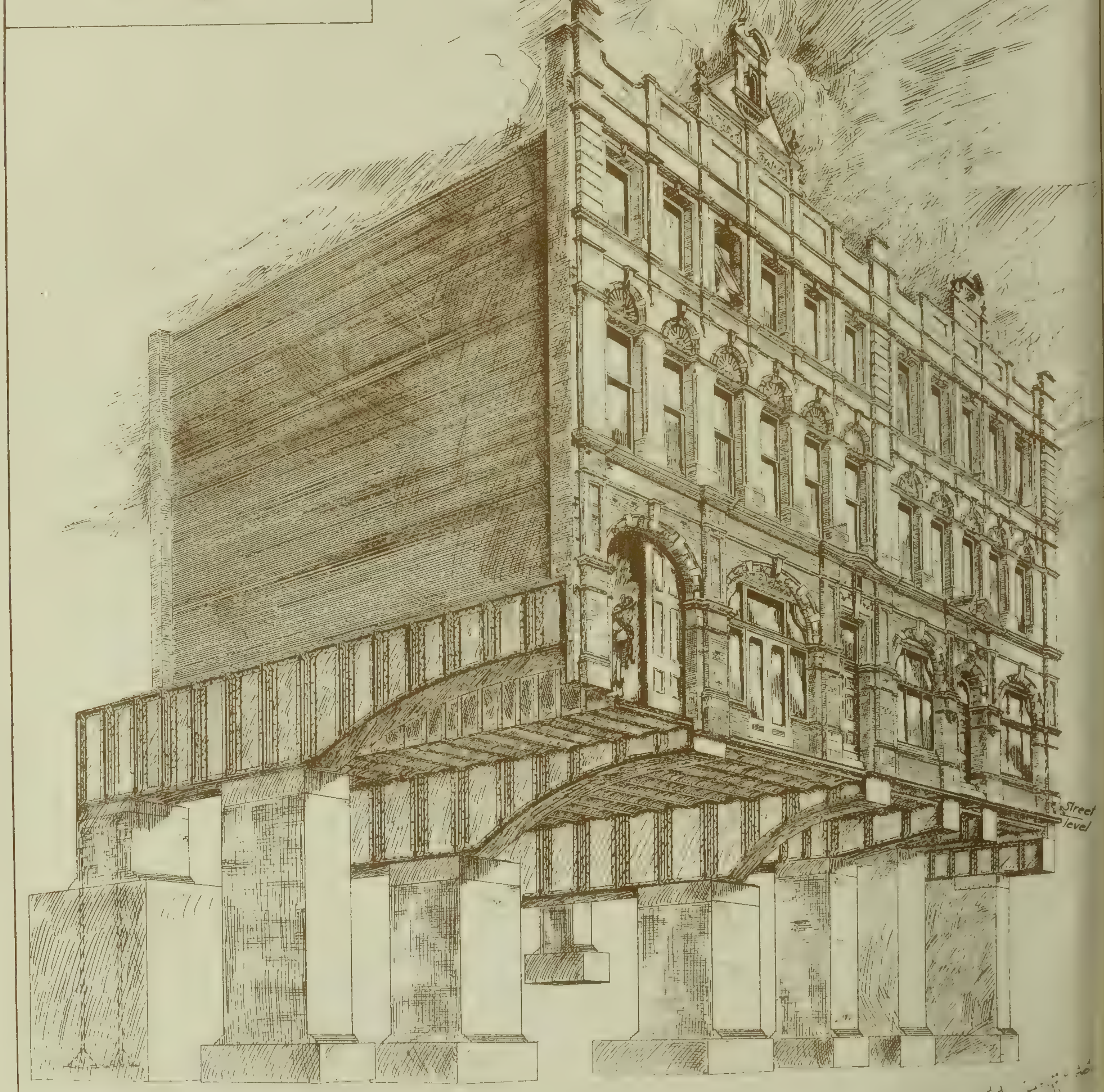
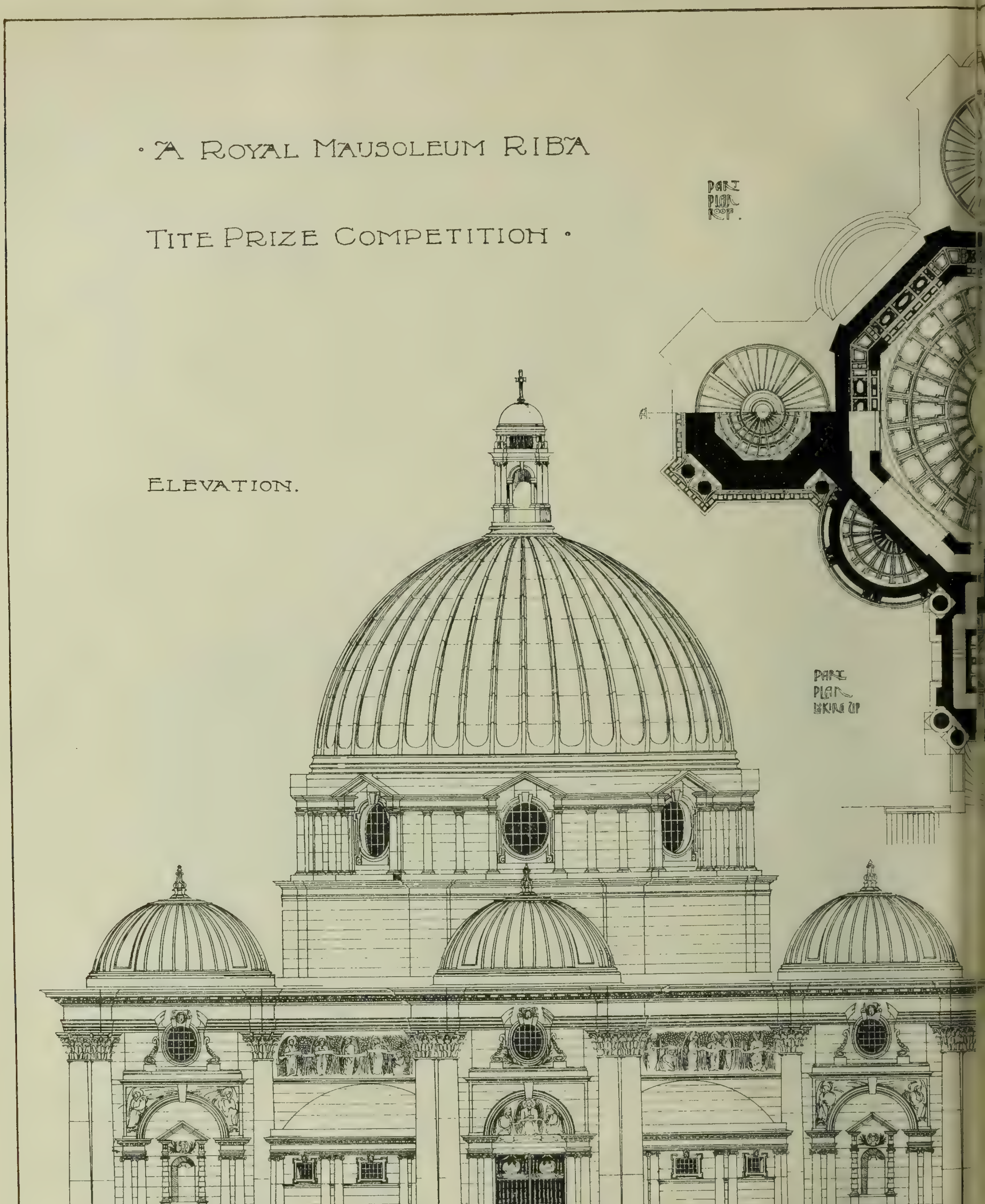


BASEMENT PLAN



BUILDING over G.W.R TUNNEL CARRS LANE BIRMINGHAM
RALPH HEATON ARCHT


· A ROYAL MAUSOLEUM RIBA
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PART PLAN ROOF.
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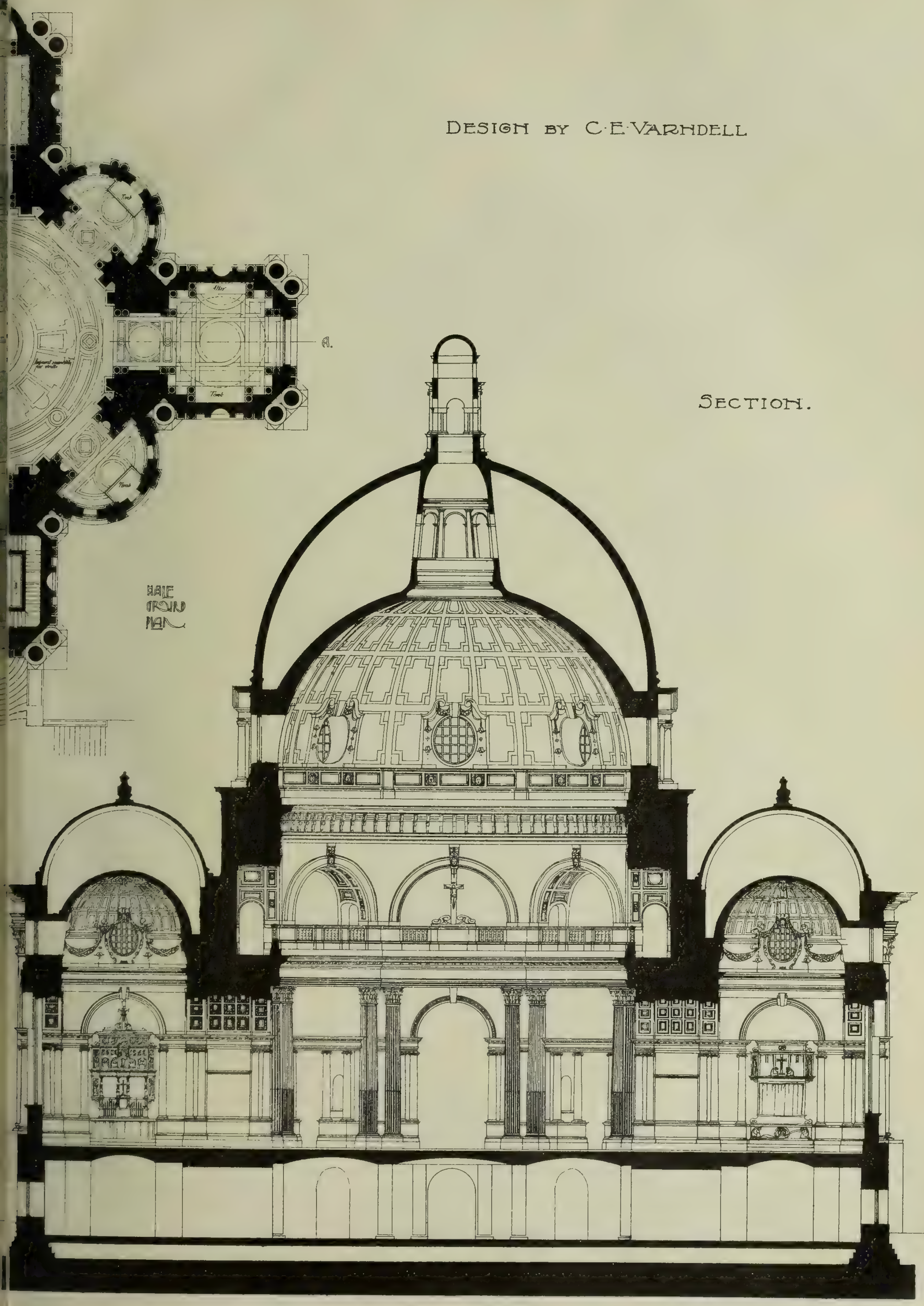
A

DESIGN BY C·E·VARNDELL



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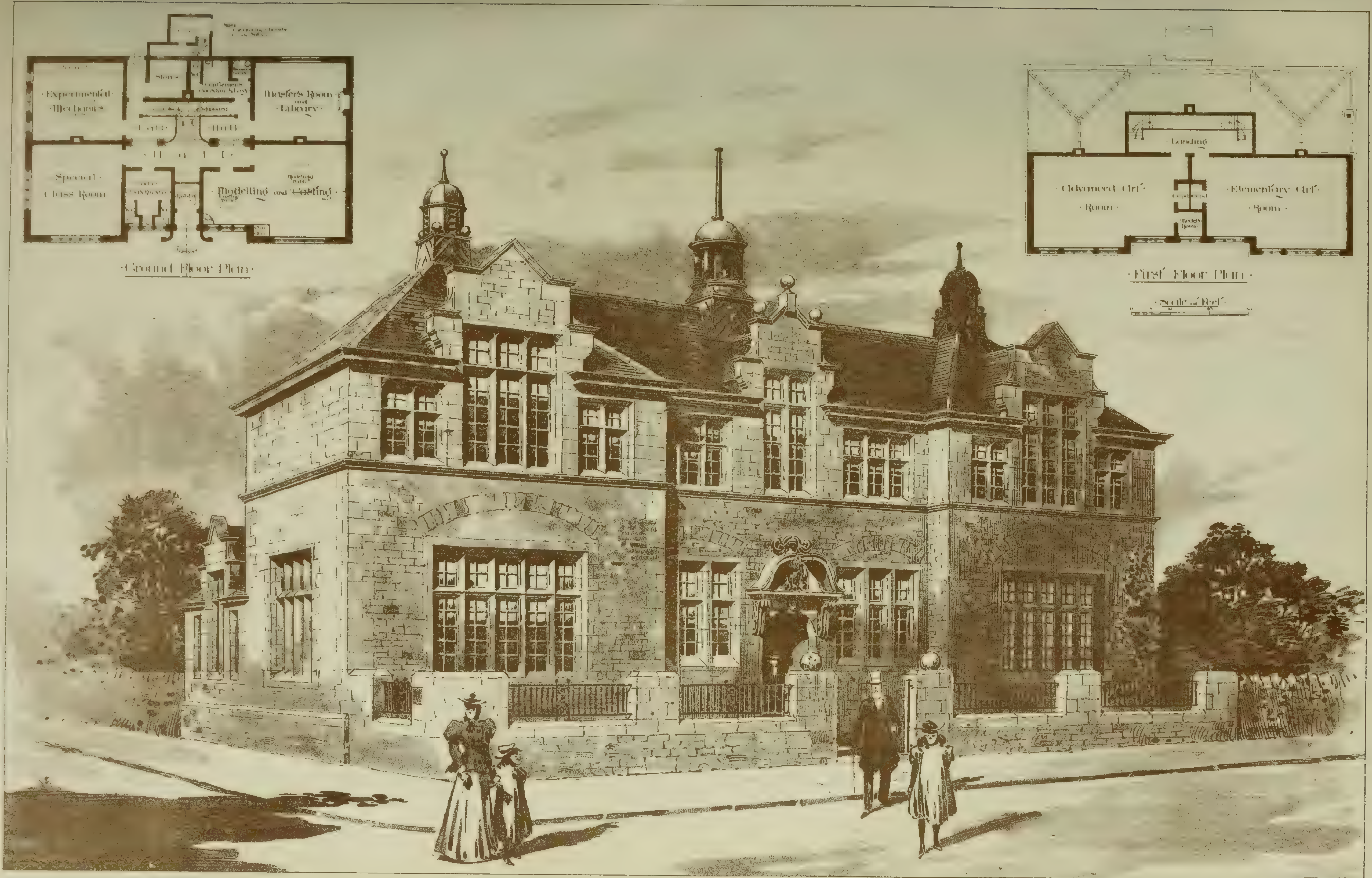

·Frome Science and Art School Competition· Second Premiated Design
Robert F. Brinkworth Archt.

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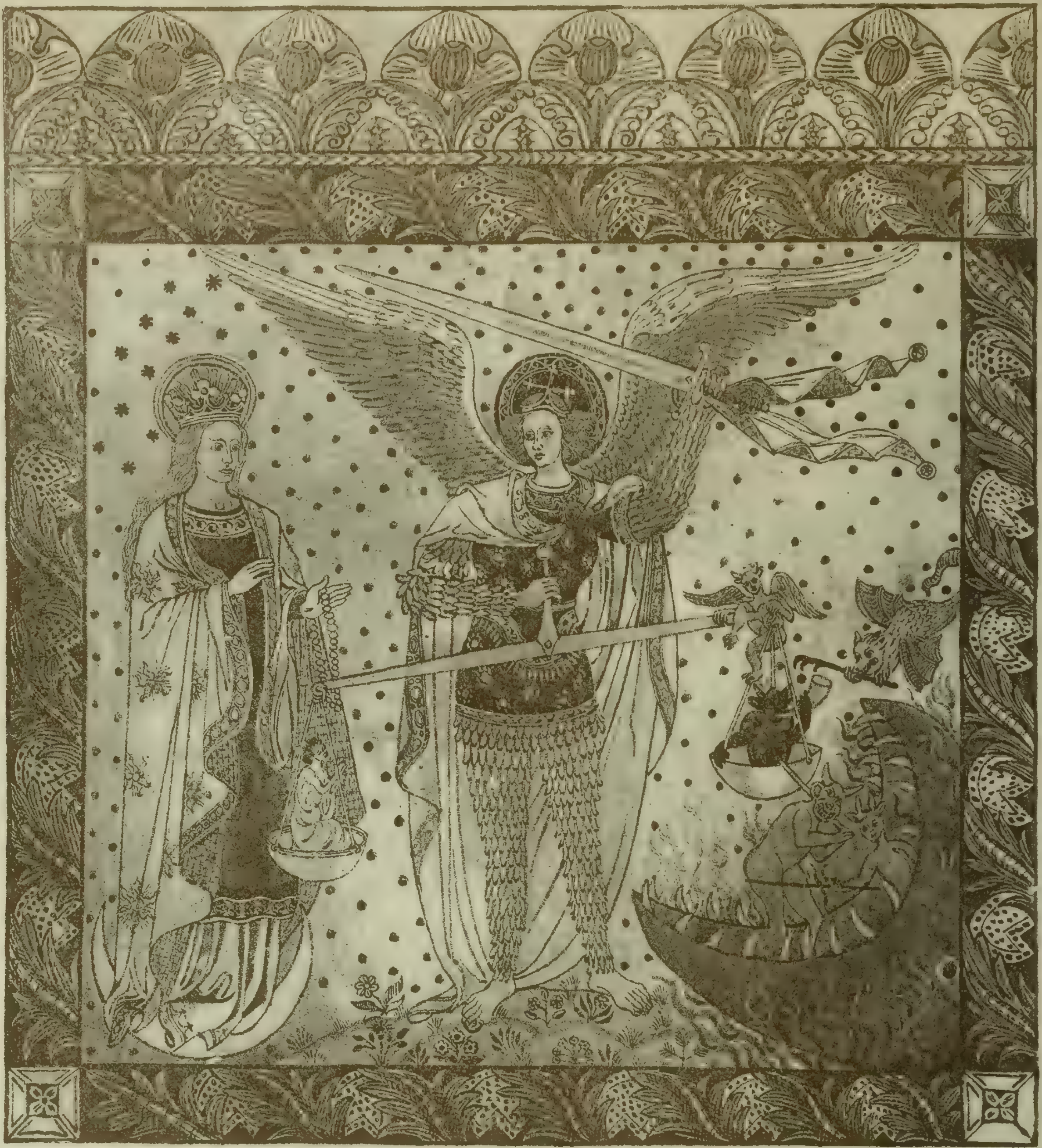

SOUTH·LEIGH·CH·
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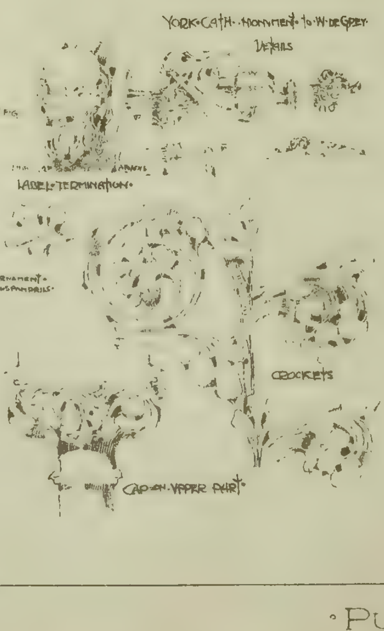
YORK· CAPS FROM·MONUMENT·TO W·DEGREY



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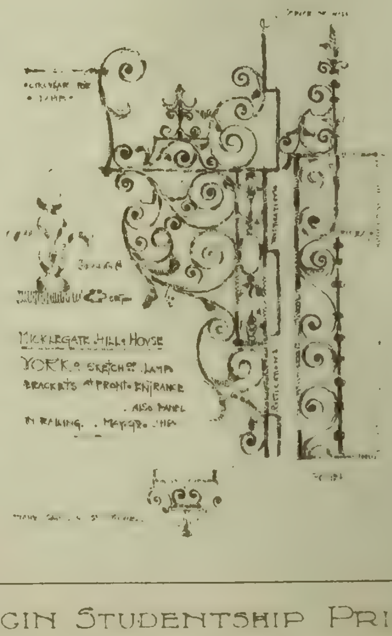

MICKLEGATE HILL·HOUSE
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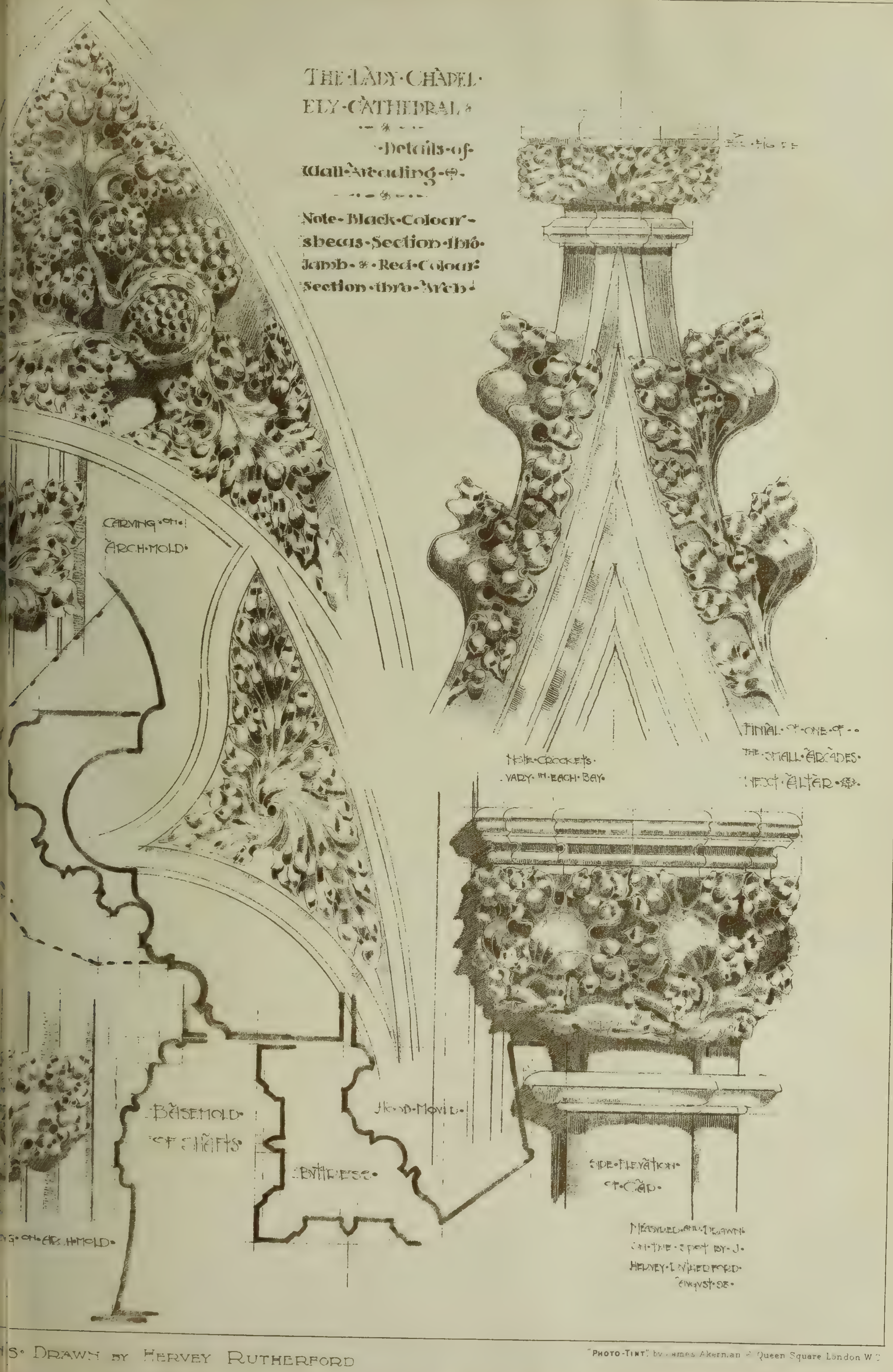

THE·LADY·CHAPEL·
ELY·CATHEDRAL·

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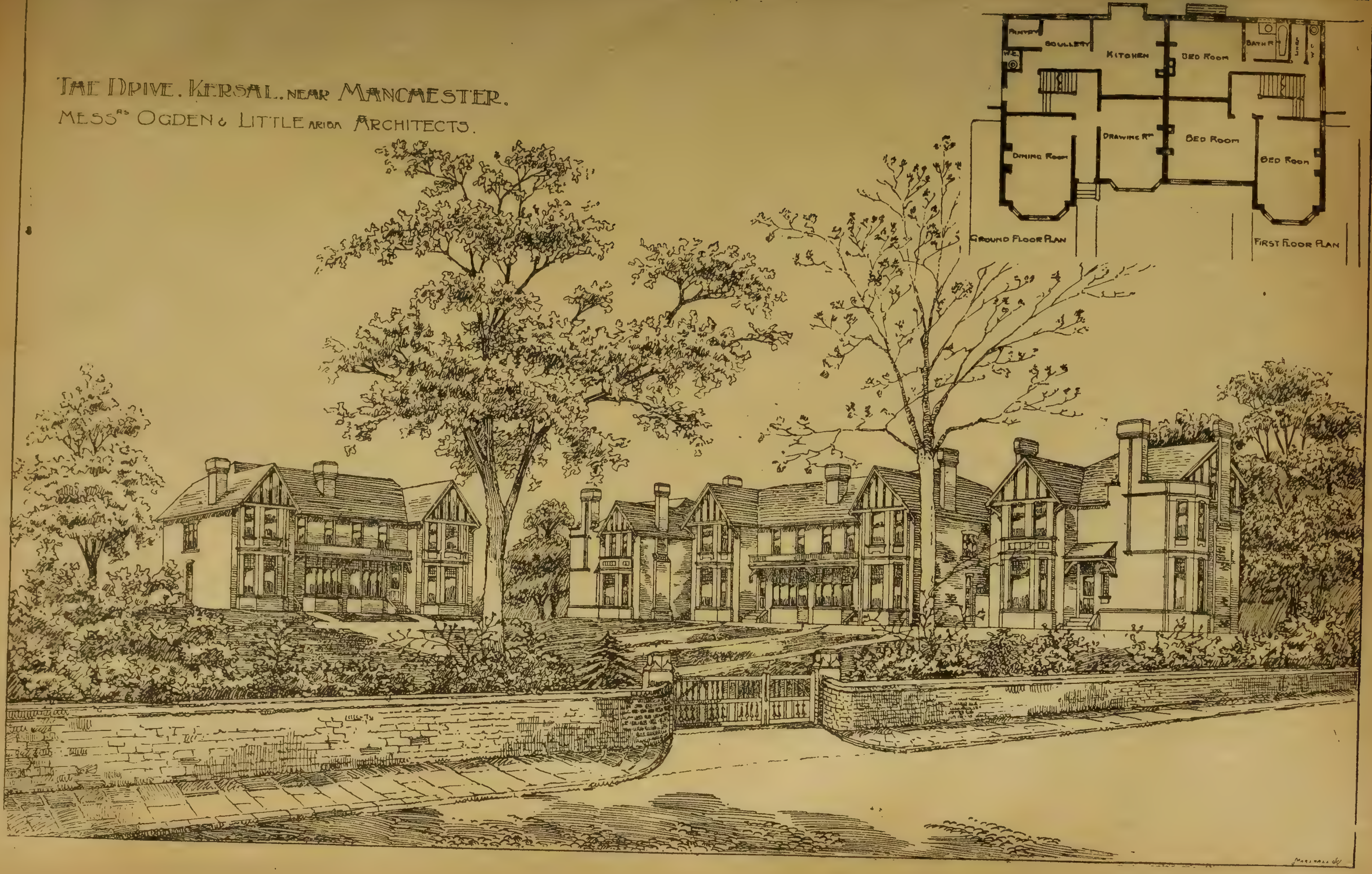
S· DRAWN BY HERVEY RUTHERFORD

"PHOTO-TINT" by James Akerman 8 Queen Square London W.C.



THE DRIVE. KERSAL. NEAR MANCHESTER.
MESS^RS OGDEN & LITTLE ARIBA ARCHITECTS.

Correspondence.

"TWO GREAT CITIES."

To the Editor of the Building News.

Sir,—I note that Mr. W. Woodward, on p. 325, calls attention to the dirty condition of the city of Paris. The same thing struck me last year; but I thought that it might be the change from the sunny Swiss land to wet, dull weather. This year, when I passed through the city, the weather was fine, and my former impressions were confirmed. I considered that the streets were dirty, the house-fronts required a thorough cleansing, and the woodwork required many coats of paint.

Has it ever struck anybody that proper ventilation of the rooms cannot be obtained by the use of casements? Take the case of a large Continental dining-room. Directly the hotel visitors assemble every casement is closed, so fearful are the natives of a little fresh air, and the room soon becomes unbearable. Give me a sash and frame, with ability to open at the top.—I am, &c.,

Henry Lovegrove.

Eboracum, Herne Hill, S.E.

CHIPS.

Mrs. Dymoke, of Scrivelsby Court, Lincolnshire, has erected a stained-glass window in the parish church in memory of her late husband, Mr. Francis Dymoke, the Hereditary Champion of England.

Mr. R. H. Bicknell, M.Inst.C.E., on behalf of the Local Government Board, conducted an inquiry on Friday into an application by the Otley Urban District Council for sanction to borrow £4,500 for the purposes of sewerage and sewage disposal works.

The U.D.C. of Armagh have approved of the specification submitted by Mr. J. Finlay Peddie for a sewage-disposal works upon the septic tank system, and a loan of £12,000 is to be applied for.

On Saturday last the Yorkshire Foresters' Orphanage and Convalescent Home at Bridlington was opened by Mr. J. T. Firbank, M.P. for East Hull, in the presence of a large concourse of members of friendly societies. The building has been erected by Messrs. F. Blackburn and Son, of Hull, and the architect is Mr. Robert J. Beale, A.R.I.B.A., of London, whose design was selected in open competition.

The Mayor of Bradford laid on Saturday the foundation-stones of a new Sunday-school in connection with the Annesley Wesleyan Chapel, Little Horton-lane, Bradford. The school will accommodate 600 children, and the cost is estimated at about £5,000.

The unsightly parish church of All Saints, in the New Cut, Lambeth, though only some forty years old, is exceedingly dilapidated, and is to be pulled down, as the London and South-Western Railway requires the site for an extension of Waterloo Station, and the parish is to be absorbed in that of St. John's, Waterloo-road. The spire and upper part of the tower, having become dangerous, were demolished a dozen years since by the Metropolitan Board of Works, after an unsuccessful attempt to compel the incumbent to take action.

Colonel A. C. Smith, R.E., sitting at the offices of the Willesden Urban District Council, held an inquiry, on Monday, on behalf of the Local Government Board, into an application made by the Willesden Council "for sanction to borrow £50,000 for the purchase of the Dollis Hill Estate for the purpose of public walks and pleasure grounds." Mr. Bartley Dennis, barrister, appeared in support of the application, and Dr. Bernard O'Connor appeared in support of a petition, signed by 2,000 persons, which has been sent by the Local Government Board in opposition to the proposed purchase.

The City Court of Common Council resolved, on Monday, to spend a sum not exceeding £17,000 in the erection of new stables for the Lord Mayor, new offices for weights and measures, and new drains and paving yard. Authority was given to a committee to purchase from the Ecclesiastical Commissioners the site of the Church of St. Michael Bassishaw, in Basinghall-street, for £36,000.

In the list of adjudications published in Tuesday's *London Gazette*, the name appears of John Alfred Langston, Lonsdale-road, Barnsbury, N., late Took's-court, Chancery-lane, W.C., architect.

In consequence of the great growth of traffic upon the Lancashire and Yorkshire Railway, the directors are contemplating the laying of a second double line of rails between Normanton and Todmorden. The distance is about thirty miles, and the estimated cost of the works proposed is £2,000,000.

Intercommunication.

QUESTIONS.

[12317.]—**Roman Remains.**—Can any of your readers kindly inform me where I can obtain particulars of the recently-discovered remains in a field near Martigny Valais, in Canton Vaud, Switzerland? Only walls are now visible; but I was informed that a staircase had been opened and covered up again.—H. Lovegrove.

[12318.]—**Burial-Grounds.**—I shall be much obliged if anyone who has had experience in laying-out burial-grounds can give me particulars as to the authorities (Government or otherwise) that have any power in the matter, and what are their requirements? I wish particularly to know to whom the plan has to be submitted, and what authorities will require a copy of the plan to be deposited with them?—S. A.

[12319.]—**Coke-Breeze in Mortar and Concrete.**—(1) Is the pan breeze—i.e., the gas-coke breeze which has been reused by the gas companies for fuel, fit for use in making Portland cement fire-resisting floor concrete? (2) Is coke, after it has been used for the making of "water-gas" (with which the companies now enrich their ordinary gas) made less useful for this purpose? Note: the water-gas is made by impinging steam on the coke. (3) Furnace ashes are said to be an excellent ingredient in the making of mortar with either lias lime or grey stone lime. Would coke-breeze be as good if ground in a mill, or would it be too soft and grind up too fine?—Morgell.

[12320.]—**The Electric Tramway System.**—Will any reader acquainted with the cost of laying down street tramways on the electric-traction system give me some idea of the relative expense between this and horse traction?—Enquirer.

[12321.]—**Laying Bricks, &c.**—How many bricks should a bricklayer lay in a day as an average, and how many old bricks can he clean and stack? I should also like to know the number of cube feet of one-brick walling can be done in a day with the joints struck? Different estimates have been given me, but I should like an authoritative answer.—A. L.

[12322.]—**Lightning Conductors.**—In specifying a lightning conductor for a lofty factory chimney, what diameter should be used for iron, and how connected to shaft? A reply will oblige yours.—Nemo.

[12323.]—**Cutting Up Slate.**—Can any reader give me any hints on cutting slate up? I have a milling-machine, and have tried to use a cutter with teeth; but it will not do. I have got a lot to cut, so should like to cut it quick. I have also got to enamel the slate, so should like to know how to do this? I am making an iron stove to bake it, as I was told to do. I was told that to get a fine, smooth gloss on the slate it has to be done by hand. Is this right? Any hint will greatly oblige.—Enamel.

[12324.]—**Acetylene Gas.**—I am desirous of illuminating my premises and shop with acetylene gas. All the price lists which I have from the different firms seem to speak very highly of it, not only with regard to the clean light for shops and for its brilliancy, but also the saving in expense, for the makers claim that the gas can be made for 2s. 6d. per 1,000ft., whereas the coal-gas in this town is 3s. 9d. per 1,000ft. As you can see, we have coal-gas in this town, but it is not satisfactory unless mantles are used, which soon seem to diminish in illuminating power, as well as requiring a lot of attention. I am rather dubious of trying the experiment, for the reason I cannot understand why acetylene is not in more general use than it seems to be if it has all the advantages claimed for it. Should you advise the use of acetylene where coal-gas is laid on in the town?—Percy Wadham, Newport, I. of W.

[12325.]—**Colouring Brickwork.**—In using Grey Stocks (Luton) it is found that the natural colour is not always deep enough. Can any means be mentioned to insure a permanent tone, and also to darken the mortar-joints without destruction? Copperas for the purpose is useless.—Grey Stock.

REPLIES.

[12309.]—**Portland Cement Stucco.**—The stucco may be made with Portland cement and sharp sand 1 of cement to 3 of sand. The joints should be first raked out, and the face of brickwork hacked to form a key. The stucco is sometimes painted four coats. The sand should be washed sand. The thickness would be about 1in. thick. The work, if properly done, keeps out ordinary dampness. In exposed seaside places it is often used, as at Brighton, Eastbourne, Folkestone, &c.—Quod Vide.

[12312.]—**Sanitary Fittings.**—These are numerous, and any sanitary catalogue will give you good forms of traps for waste-pipes to discharge over. The "Grosvenor Gully" is a good form of trap for taking surface water, wastes from baths, &c. Doulton's, and also Duckett's catalogues give some excellent gully-traps suitable for your purpose, and you cannot do better than to get these lists and make a selection.—Practical.

[12313.]—**Discoloured Water in Bath.**—Perhaps your best plan will be to keep a few water-snails (Planorbis corneus) in your bath.—S. Bottone.

[12315.]—**Turret Clocks.**—I know of no book on the subject. Why not write to two or three of the larger firms of clockmakers?—H. L.

Colonel A. J. Hepper, R.E., the inspector appointed by the Local Government Board, held an inquiry at Old Hill, Staffs, on Friday, respecting the application by the Rowley Regis District Council for sanction to a loan of £1,150 for the extension of the public offices, and £3,000 for street improvements.

WATER SUPPLY AND SANITARY MATTERS.

Shipley.—A series of sewerage works is being carried out at Shipley, near Saltaire, in the West Riding, for the urban district council, from plans and under the direction of Mr. Malcolm Peterson. The district was drained long ago, and little remained to be done to collect the sewage but to put in large intercepting sewers and to stop up the outfalls into the river and the Bradford Beck. This, however, was a very costly and difficult undertaking. The intercepting sewers follow the courses of the river and the beck. The Windhill district had to be drained throughout, the system of drainage existing when Windhill was added to the area of the Shipley District Council being of the most primitive character. All this preliminary work has now been done, and active operations are going on at Dock Field in the construction of tanks and buildings for the reception and treatment of the sewage. A tract of land extending over thirty-four acres has been acquired, and is being prepared to receive the waste of the Shipley district, and to so treat it that nothing shall be left but dry sludge and a clear effluent. The estimate for the whole of the contracts came to over £50,000. An extra expenditure of nearly £5,000 has been entailed by the demand of the Local Government Board for land filtration, in addition to the bacteriological treatment which has been decided upon by the district council. The intercepting sewers have both to be carried under the Leeds and Liverpool canal. They then communicate with a tank sewer of irregular formation, the average dimensions being 88ft. diam. The tank sewer is 800ft. long, and from it the sewage will be pumped and forced to a height of about 45ft. It will first enter the grit-tanks, of which there are three for alternate use. Here the gritty matter will be precipitated as the sewage flows towards the bacterial beds. Sludge-pits are provided for the reception of the matter precipitated in the grit-tanks. The sewage next passes to the bacterial beds, of which there are two series. Each series consists of four tanks, filled with clinker, the coarse being each 100ft. long by 66ft. wide, and the fine the same length, but 72ft. wide. After this treatment the effluent will be carried to the land filtration works. At the suggestion of the Local Government Board provision has also been made for the carrying of storm water in times of flood direct on to three acres of clinker ashes for filtration before being conveyed into the river. The chief erections in connection with the works are an engine-house, 84ft. by 33ft., and about 30ft. high; a boiler-house and destructor shed, 84ft. by 62ft., to contain four Lancashire boilers and a four-cell destructor by Messrs. Meldrum and Co., Limited, of Manchester; a chimney 180ft. high, 19ft. square at the base, and with a flue of 7ft. 4in. diameter; stabling and workshops, and three cottages for workpeople. The engine-house will generate electricity not only for pumping purposes, but for street lighting and sale to some limited extent. The intercepting sewers were laid by Mr. William Foster, Bingley, and Messrs. Ross, Wilks, and Crabtree, Shipley. The drainage of the Windhill portion of the district was carried out by Messrs. Rhodes Bros., Shipley, under the direction of Messrs. W. B. Woodhead and Son, Bradford. The precipitation and other tanks have been constructed by Mr. Robert Wood, Bingley, and Mr. Thomas Smith, Bingley, has been intrusted with the preparation of the land for the irrigation process. The pumps, motors, and engines are being supplied by Messrs. Cole, Marchent, and Morley, Limited, of Bradford. The various contractors are as follows: Mason's work, Messrs. H. Birkby and Sons, Wyke; plasterer's work, Messrs. Walker and Wilkinson, Shipley; plumber's work, Messrs. Wilks and Ross, and Mr. John Pitts, Shipley; joiner's work, Mr. William Atkins, Windhill; slater's work, Mr. Thomas Thornton, Shipley; ironwork, Mr. J. B. Clabour, Guiseley. There have been two clerks of the works, Mr. J. E. Pickard and Mr. J. C. Coates, the latter being at present in charge.

A monument is to be erected in the nave of Canterbury Cathedral in memory of officers, non-commissioned officers, and privates of the 1st Batt. the Buffs (East Kent Regiment) who were killed in action or died of wounds or disease in the Chitral and Punjab frontier campaign from 1895 to 1898. The monument is being erected by the comrades of the deceased.

A new filter-bed was opened last week at the corporation waterworks, Loughborough, Leicestershire. The bed, the fifth at the works, is in size 65ft. by 55ft., while it is 8ft. in depth. It is composed of 9in. of ½in. gravel, 3in. of pea gravel, and 3ft. 6in. of sand, representing about 700 tons altogether. Four parts of Nottingham rock sand and one part of Trent sand are utilised in the formation of the bed, which has a capacity of 156,000gal. Mr. Price, of Nottingham, was the contractor, and the plans were prepared by Mr. Walker, of Loughborough. The cost was £1,400.

LEGAL INTELLIGENCE.

In re J. Young and Sons, Edinburgh.—Meetings were held in Edinburgh, on Friday, of the shareholders and creditors of James Young and Sons, Limited, contractors, incorporated as a company in March last. Reports on the state of affairs were read, from which it appeared that the total liabilities of the company were £61,170, and the assets £56,884, leaving a deficiency of £4,286. The contracts in progress included one for £310,000 with the North British Railway Company, of which one-third was completed, and another large one for the construction of the Talla Waterworks with the Edinburgh and District Water Trust. The committee of shareholders were of opinion that the affairs of the company were so hopelessly involved that immediate steps should be taken for winding-up. This course was agreed to at both meetings, and it was resolved to present a petition to the Edinburgh Bankruptcy Court.

In re Wade Brothers, of Leeds.—A meeting was held at the offices of the Leeds Official Receiver (Mr. J. Bowling), on Friday, of the creditors of Edward Wade and Jonathan Wade, carrying on business as Wade Brothers, builders and contractors, Cliff-road and Eltham-place, Woodhouse, Leeds. The statement of affairs showed liabilities £2,980 19s. 11d., and assets £1,287 4s. 1d., the deficiency thus being £1,693 15s. 10d. The debtors attribute their failure to "losses on building contracts and builders' strike." They filed their petition on judgment for £177 19s. 11d. Debtors commenced as jobbing bricklayers in 1882 with £30 belonging to Jonathan Wade, formed a good connection, and accumulated plant and tackling which enabled them in 1887 to commence contract work in a small way. Their contract work amounted to an average of about £1,000 a year up to 1898, when they entered into a contract for £9,267. They now stated that they had lost considerably thereby, in consequence of the strike in the building trade, and not being able to keep a proper staff of men. They were brought to a stand at the beginning of last month on receiving notice from the surveyor to employ more men. The work being taken out of their hands, plant in use on the contract, worth £150, and a balance due of £359, a total sum of £509, was detained against loss on completion. They allege that on the work being measured off the balance due to them was considerably less than they expected, and they first became aware they were insolvent. The creditors appointed Mr. John Gordon as trustee, with a committee of inspection.

Re F. T. Rundall, late of Weston-super-Mare and Birmingham.—At the London Bankruptcy-court, on Tuesday, a sitting was held before Mr. Registrar Giffard for the public examination of this debtor, who applied to pass upon accounts showing unsecured debts £450, and assets £3. In examination by Mr. Chapman (official receiver), the debtor stated that he was articled to a surveyor in London, and in 1883 he went to America, and was employed in New York as a quantity surveyor. He returned to England, and in 1892 he obtained employment at Weston-super-Mare as town superintendent at £2 a week, with coal and gas. He left that employment in 1896, and obtained the post of district surveyor to the Birmingham Corporation at a salary of £150 a year. Most of his debts were incurred while at the latter place, including that of the petitioning creditor, Mr. Isaac Cohen, of 5, Union-street, Birmingham. While living at Bristol he borrowed £50 on his furniture to enable him to pay out an execution. His failure was due to living above his income and to heavy interest on borrowed money. The public examination was concluded.

The Roman Catholic schools in Hyde Abbey-road, Winchester, were opened last week. They have been built at a cost of over £3,000, from plans by Messrs. Colson, Farrow, and Nisbet, of Winchester and London, the contractors being Messrs. Carter and Son, of Winchester.

On Wednesday Major-General H. D. Crozier, R.E., Local Government Board inspector, held an inquiry at East Ashford Workhouse into the application by the East Ashford Rural District Council for sanction to effect a loan of £11,000 for the public water supply of Willesborough. Mr. Bailey Denton, C.E., the engineer, said he had bored into the Hythe bed of the lower greensands at Plumpton, and at a depth of 170ft. came upon a spring which was yielding 200,000 gallons per day.

An accident, attended with fatal results, occurred on Monday, in connection with the sewerage works of the Whitechapel District Board of Works in the Mile End-road. In consequence of the District Railway Company having begun to extend their railway from Whitechapel to Bow all the local sewers have to be reconstructed. While several men and boys were standing on a stage working a heavy crane, suddenly the scaffolding collapsed, and several of the men were buried in the *débris*. One man was killed and several others severely injured.

Our Office Table.

Sir Benjamin Stone has just handed to Mr. George Scamell, the hon. secretary of the National Photographic Record Association, for the British Museum collection, a further contribution of 100 historical photographs of varied objects of interest. The series includes views of the ruins of several abbeys and priories, of well-preserved relics and monuments in parish churches, and pictures of many old English mansions and inns. The collection also comprises pictures of ancient stocks and whipping-posts, of the ducking-stool preserved at Leominster, and other survivals. There are also objects of interest of still more remote historic periods, such as Stonehenge, Silbury-hill, and Avebury, side by side with the most modern of records of daily life.

A faculty applied for by the vicar and churchwardens of the parish of Penn, near High Wycombe, for the removal of a dilapidated high-backed pew in the historic church, has been granted, and the pew has just been taken down. The floor upon which it stood was found to be a false one, resting on the original floor, which had perished to such an extent as to be a source of considerable danger. The decayed material having been cleared away, the coffin of one William Penn, buried there in 1638, was discovered lying within 4in. of the surface. It was of oak, black with age, and perfectly sound, and, having been carefully covered and sealed, the floor was relaid and cemented round. Who was this William Penn? The William Penn who occurs to everybody's mind on hearing the mention of the name lies in the Quaker's burial-ground at Jordan, and the year of his death was 1718. Admiral Sir William Penn did not die till 1670, and he lies in St. Mary Redcliffe's, Bristol.

The Clifton Antiquarian Society and the Monmouthshire and Caerleon Antiquarian Association have, under the superintendence of Mr. A. T. Martin, of Clifton, been making some extensive explorations at Caerwent, the site of the ancient Venta Silurum, which, "doubtless, dates its origin from the time of the subjugation of the Silures by Ostorius and Frontinus in the years 50-75 A.D." The excavations have resulted in the discovery of the remains of a couple of Roman buildings extending over a large area, and the foundations and walls, which still exist to an average height of between two and three feet, have been denuded of the coverings of earth which have concealed them for centuries. Specimens of pottery, coins, and other relics have been found amongst the *débris*, amongst them being an urn of black ware in perfect, but unfinished, condition, as though the potter had been disturbed in his work, and left it incompleted as far as the rim was concerned. Excavations have also been made to a depth of about 20ft. or so on the inner side of the south-west corner of the city wall, displaying the plinth course, the bottom wall, and the top wall, which are in excellent preservation, for a height of about 15ft.

Mr. F. H. Shrine writes from Ardvourlie, Lochearnhead, complaining of the vandalism committed by the military authorities at Stirling, an erstwhile capital associated with the proudest of Scottish history. The castle is the depot of a Highland regiment, and its public edifices have been ruthlessly disfigured to provide accommodation for the garrison. The former palace, still decorated with emblematical statues and perfect in its proportions, is a soldiers' recreation club. The halls, which once resounded with wassail and minstrelsy, now re-echo the click of billiard-balls. The splendid Gothic Parliament House has its ancient windows built up, and is parcelled off into dormitories. The Chapel Royal, in which James VI. was christened and crowned, is divided by hideous planking into two floors, and serves as an armoury and a waiting-room for picnic parties. In an inner quadrangle, and overlooking a beautiful hanging garden, is the room wherein the Earl of Douglas was murdered by James II. It was damaged some years ago by a fire, and has been rebuilt, says Mr. Shrine, without the slightest regard for architectural propriety. Here are installed a paltry attempt at a museum, and a counter for the sale of pop-guns, post-cards, and souvenirs of Stirling. The inner moat is the officers' lawn-tennis court, the tilting ground has been thrown into the neighbouring cemetery, and is covered with common-place tombs. The importance of the castle from a military point of view has gone for ever, and if it were considered necessary to retain it as a depot for troops they should be housed in modern barracks. The whole buildings might serve as a museum of mediæval antiquities. Hither should be removed the standard weights and measures now kept in the Guild Hall, the oaken busts of kings and queens, known as the "Stirling Heads," deposited in the Smith Institution, and the ancient weapons removed in the last century to the Tower of London. But vandalism at Stirling is not confined to the castle. The glorious old Greyfriars' Church has suffered as grievously at the hands of the mutilator. About 250 years ago it was divided into two parish churches by solid party-walls and a vaulted passage. The royal pew, still bearing the arms of Scotland, has been nearly filled with masses of masonry, and the effect of the unity of design, of long-drawn aisle and fretted vault has been entirely lost.

The changes at the National Gallery during the recess have been not numerous, but important. They have been chiefly structural. Rooms XIII. and XIV., the Spanish and the late Italian, are closed, and have been inaccessible to the public for the last fortnight. Under these are located the principal heating apparatus of the Gallery. The pipes which used to go round these rooms are now being placed under the floor, the heat ascending through the grating, as in the case of the other galleries. This work is a bigger job than the mere statement of it suggests, and the rooms will probably not be opened for another fortnight.

Fresh additions to the collection recently acquired have been few and not very important. The most worthy of note is a portrait—No. 1680, in Room XI., devoted to the Dutch and Flemish schools—which is cautiously attributed to Karel du Jardin. It gives the head and shoulders of some Dutch gentleman, refined in type, in a sage-green doublet, slashed sleeves, and Vandyck collar. Dr. Jardin died in 1678, and is better known for cattle pieces, rather in the Paul Potter style, than for portrait. There are two of these in Room XII. But this "Portrait of a Gentleman" has been placed between the two Franz Hals, the man and woman with the ruff. Another picture, interesting rather than excellent, is the little Virgin and Child, by Francesco Giorgio, in Room II. This is painted in tempera, on "that background of pale gold which the Tuscan's early art preferred." The conception is wholly unconventional, the Virgin standing and leading the little stockinged child tenderly by the hand. On a smaller scale it might be a page out of a missal.

St. Martin's School of Art, in Castle-street, Long Acre, has already achieved considerable reputation as a centre of art training. Its students have secured a number of prizes and certificates, and the work is carried on now in connection with a large number of important bodies, including the Science and Art Department, the London County Council Technical Education Board, the Coach and Coach Harness Makers' Company, the Institute of British Carriage Manufacturers, and the City and Guilds of London Institute. An annual exhibition of students' work is held every year in the school, and the productions seen there on Wednesday were comprehensive in scope and excellent in character and finish. Whether in free-hand or model drawing, prospective shading, drawing from the life, architectural designs, flower designs, decorative panels, or outlines from plants and casts, the work accomplished was of a satisfactory character, a proof not only of the skill and care of the teaching, but of the talents of the students. Some artistic designs for posters were most effective. Special attention is given at the school to carriage building, and during the winter a special course of instruction is to be given on this subject by Mr. E. Bailey, of the City and Guilds Institute.

The collection of pictures forming the twelfth exhibition of oil-paintings and water-colours, promoted by the Art Gallery Committee of the corporation of Dudley, was opened to the public on Wednesday. Although the collection, consisting of 127 oil-paintings and 39 water-colours, is not so numerous, and does not include so many Academy and New Gallery pictures as in some past exhibitions, it contains many works of exceptional merit. As last year, the best position on the walls is accorded to Mr. John R. Reid, who shows his picture "The Blind Fiddler"—an old vagrant attended by his daughter and dog. Other works of note are three seascapes by Napier Hemy, and two by T. Cockram, Charles Stuart's group of deer beneath a mountain, entitled "Their Native Land," and examples of V. P. Yglesias, A. B. Donaldson, Norman Gastin, Flora Reid, G. P. Jacomb Hood, F. Hamilton Jackson, &c.

Messrs. Pethick Bros., of Plymouth, who are carrying out the demolition of the old Vauxhall Bridge for the London County Council, have come upon an engraved copper plate in the foundation-stone of the bridge bearing the following inscription:—

On the ninth day of May
In the year of Our Lord
MDCCCXI.
And in the Fifty-first year of the Reign
OF HIS MAJESTY KING GEORGE III.
The first stone of this Bridge
was laid by
HIS ROYAL HIGHNESS GEORGE PRINCE OF WALES REGENT
Of the United Kingdom of Great Britain and Ireland
Represented by
The Right Honourable Thomas Lord DUNDAS.

Then follow the names of the bridge proprietors and that of Mr. John Rennie, Civil Engineer. It has not transpired whether the new coins of the realm usually placed or supposed to be placed in the cavity beneath the plate were in position, or whether, as is too often the case, they had mysteriously disappeared on the night following the official ceremony.

The prospectus issued in connection with the fine art, Scottish history, and archæology section of the Glasgow International Exhibition, to be held in Kelvingrove Park during the summer of 1901, states that it is intended that the fine art section shall be a feature of special prominence and importance. The executive council have decided that loan collections of pictorial works shall be formed with the view of illustrating the progress of art during the 19th century. Art, in its widest sense, applied to the decorative treatment of material, will also be illustrated by loan collections. The new art gallery and museum building, which is to be the future home of the art and science collections of the corporation of Glasgow, and is now in course of erection from plans by Messrs. Milner-Allen and Simpson, of London, will be entirely devoted to the purposes of this section. The building, which is of stone, with concrete floors, consists of a central hall, 125ft. by 56ft., with two courts, each 102ft. by 60ft. east and west of this hall. The galleries are twelve in number, arranged in two floors around the courts, with eight pavilions at the corners. The galleries average 100ft. long by 28ft. wide. The upper galleries and pavilions are roof-lighted, and specially adapted for showing pictures. The art section will be confined to the works obtained on loan, and will embrace the following divisions:—(1) Oil-paintings of the 19th century, (2) water-colour paintings and pastels of the 19th century and miniatures, (3) sculpture and architecture, (4) works in black and white, (5) photography, (6) art objects, (7) Scottish archæology and history. The exhibition will open early in May, 1901, and continue for about six months. The collection of works will begin on Feb. 1, 1901.

The directors of the Bute Dry Dock Company, Cardiff, are about to try an experiment at their dock. They have a very large single dry dock, but it often happens that it can only be worked at half its capacity; a ship, whose length goes just beyond the caisson, requiring extensive repairs to her bottom, monopolises the whole dock until the work is completed, because another ship cannot be taken in without flooding the one under repair. The company do not possess, and find it impossible to obtain, a site for another dock. Under these circumstances Mr. Farrant Good, the managing director, has hit upon the plan of making a half-dock running out of the side of the present one. Excavations will be made to about half the depth of the present dock, and then will follow the concreting and stoning process. The object of the half-dock is that when a ship requires extensive bottom repairs she will be brought into the present dock, and, the gates being closed, the dock will be pumped up level with the walls and then the ship will be hauled broadside on to the blocks in the half-dock. At such time there will be about 13ft. 6in. of water in the half-dock, and as the mean draught of an ordinary cargo boat on an even keel is about 11ft., it will be seen that there is about 2ft. to spare. When the water is let down to its normal level again the ship in the half-dock will remain dry whilst ships go in and out of the present dock. The dimensions of the new half-dock will be 400ft. by 75ft., the accommodation and earning capacity of the dock will be increased by fully 50 per cent., whilst the cost will not exceed £25,000.

About twenty years ago there was discovered in the grounds of the Jewish School at Alexandria the shaft of a large handsome rose granite column; this was presented to the municipality, but no use was made of it until quite recently Dr. Schiess Bey, director of the Government hospital, offered to erect it on a prominent site near the hospital, from which it is visible far out to sea, as a memorial of the victories of Omdurman and Khartoum, Sept. 2, 1898. This excavation resulted in finding the capital almost uninjured at 30ft. distance from the shaft. The length of shaft is over 34ft., with a diameter of 3½ft., and weight 27 tons. The base, a separate piece, is 2ft. 4in. in height by 5ft. 5in. diameter, and the capital, which consists of two pieces, is 4ft. 6in. in height by 7ft. 9in. diagonal breadth. One side of it is not carved, but has cuts made for inserting metal cramps, as though it were originally attached to a building, the capital considerably overhanging the base of the column. The monument, when completed, will measure 55ft. 7in. from the ground to the summit. The column is believed to have belonged to the temple of Saturn, which early in the 4th century was transformed into the church of St. Michael.

The report of the Glasgow Workmen's Dwellings Company, Ltd., for the year ended June 30 last states that the houses continue to be well let and in good demand. The balance of revenue brought forward from last year was £289, and the surplus of ordinary revenue over ordinary expenditure for the present financial year, after transferring the usual percentage of the rental to repairs and depreciation, amounted to £700. After meeting all expenses the total sum available for division is £882, from which the directors recommend the payment of 4 per cent. per annum, free of Income-tax. This will absorb £578, leaving a balance of £303 to be carried forward. Greenhead-court, Bridgton, when completed will contain about 200 houses of one and two rooms, accommodating about 1,000 persons. The estimated cost of the whole is about £20,000. In view of the satisfactory results of the renovation of the old tenements, now known as George-court and Ardgowan-place, and the difficulty of acquiring suitable sites for erection of new buildings, the directors resolved to acquire additional property for alteration and renovation. They have now secured several suitable properties, consisting of about fourteen tenements. The overhaul of one of these at Brown-street, Port Dundas (near the Phœnix Park), will shortly be completed; others are about to be commenced. When these properties have been repaired and Greenhead-court completed, the subscribed capital of the company (£40,780) will have been fully invested.

Mr. Consul Powell, in his report on the trade of Philadelphia in 1898, says:—In consequence of the recent plasterers' strike in Great Britain, the export of metal walls and ceilings has been strongly suggested. The idea of these metal fronts to houses is that it does away in a great measure with plaster, and in the case of ceilings, removes the unsightly cracking and damp stains which so often appear. The plated ceilings also, besides being extremely decorative, are a very great protection against fire. I venture to hope that before these American metal walls and ceilings can be placed on the market in Great Britain some enterprising British firm may be equal to supplying the requirements of the British public. I am informed that there is a firm in this country who are turning out large quantities of paper tiles, which are used for roofing; but I am unfortunately not in a position to give details as to the process of manufacture. They are reported to be very hard and tough, and the glazing appears to be of the nature of Japanese lac. They are reported to be exceedingly cheap, and can be fashioned in any colour or shape to suit the purchaser.

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In accordance with a faculty recently granted, the parishioners of Woodplumpton, near Preston, have decided upon a scheme for the restoration of the parish church. The cost will be about £3,000, towards which £2,600 has already been raised.

MEETINGS FOR THE ENSUING WEEK.

Saturday (To-morrow.)—Northern Architectural Association. Visit to Sunderland.

Thursday.—Society of Architects. Special meeting for purpose of raising subscriptions of Members and Associates from One Guinea to Two Guineas per annum. St. James's Hall, Piccadilly. 8 p.m.

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THE ARCHITECTURAL ASSOCIATION. The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, at 6.30 p.m., and the STUDIO OPENS on TUESDAY, October 10th, at 6.30 p.m.

A Pamphlet, giving full information, and nomination forms for Membership, may be obtained on application to the SECRETARY, No. 56, Great Marlborough-street, W.

G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

CHIPS.

Mr. John Edwin Cussans, the historian of Hertfordshire, and the author of several works on heraldry and geology, died last week at the age of 62 years.

Mrs. Gladstone, on Monday, cut the first sod in connection with the new St. Deniol's Library at Hawarden, which will form part of the national memorial to the late Mr. Gladstone. Messrs. Parker and Co., of Chester, are the builders, and Messrs. Douglas and Minshall, of Chester, are the architects.

Lawrenny Castle has been fitted by Messrs. King, Limited, engineers, Liverpool, with their latest improved "Small Tube" hot-water heating apparatus, with special economical coil-heater and waterway firebars.

The picturesque Tudor brick gatehouse to Lincoln's Inn in Chancery-lane is being repaired under the direction of Mr. Dennett S. Barry, surveyor to the Honorable Society of Lincoln's Inn.

The new line which the London and North-Western Railway Company have opened up recently from Parsley Hay to Ashbourne, is about to be extended to Leek from Hartington, a village at the head of Beresford Dale. The Leek and Manifold Valley Light Railway will extend from Hulme-end, about one mile from Hartington, to Waterhouse, where it will join the North Staffordshire Railway, thus forming a connection between Hartington (Hulme-end), Leek, and the Potteries. The first sod of this line will be cut by the Duke of Devonshire at Waterhouse on Monday week, Oct. 3rd.

The partnership heretofore subsisting between F. A. Stevenson and B. Earp, architects and surveyors, Eastbourne and Bexhill-on-Sea, under the style of Stevenson and Earp, has been dissolved.

A movement is said to be on foot in Ireland to develop the Queen's County anthracite mines, in so far as providing a railway connection between the pits and the main line of the Great Southern and Western Railway Company. Efforts are being made to induce the Chief Secretary to recommend the Treasury to grant a sufficient sum to make the line to Portarlington.

The committee of management of the Royal Orthopædic Hospital announce that the out-patient department will be reopened on Monday next, the 25th inst., and the wards will be ready for the reception of in-patients about one month later. The sanitary and architectural works, which have been carried out under the direction of Professor W. H. Corfield and Mr. Keith D. Young respectively, will cost nearly £2,000.

An expedition, consisting of the Consul-General, Herr Stemrich, the engineers, Herr von Kapp and Herr Mackensen, and the architect, Herr Habich, left Konieh on Saturday last to investigate the conditions under which the work of extending the Anatolian railway to the Persian Gulf will have to be carried out. The expedition will cross the Cilician Taurus, and, passing over the Euphrates at Biredjik, will traverse Upper Mesopotamia till it reaches the Tigris, and will then follow the course of that river as far as Baghdad. The return journey will be through the valley of the Euphrates. It is not expected that the expedition will have finished its work before April.

The corporation of Great Yarmouth have entered into an agreement with the trustees of the Cliff Park Estate at Gorleston to take over and maintain the face of the cliffs and a strip averaging 50ft. wide on the summit for the whole length of the estate. The land will be fenced off with iron railing and maintained as a promenade at an ultimate estimated cost to the ratepayers of between £5,000 and £6,000.

The unsanitary condition of Naples is gradually being remedied. In the old quarters of the city ten miles of new streets have been made during the last ten years. The result of the new drainage arrangements has become very apparent, and deaths from infectious diseases are said to have greatly diminished.

Trade News.

WAGES MOVEMENTS.

The Skilled Labour Market.—The Labour Department report that the general state of employment during August continued good, with little change. The percentage of unemployed members returned by trade unions was the same as in the two previous months, and lower than at any similar period since 1890. In the 123 trade unions making returns, with an aggregate membership of 502,439, 11,573 (or 2 3 per cent.) were reported as unemployed at the end of August, the same percentage as in June and July, compared with 2·8 per cent. in the 117 unions, with a membership of 466,025, from which returns were received for August, 1898. Employment in the building trades has remained good. Thirty-three fresh disputes occurred in August, 1899, involving 10,232 workpeople, and of these five occurred in the building trades.

Conciliation Board for Building Trades.—The establishment of a Conciliation Board in connection with the building trades is now, we are glad to announce, an accomplished fact. It will consist of 15 members of the National Association of Master Builders of Great Britain and Ireland, and 15 representatives from the Amalgamated Society of Carpenters and Joiners, the General Union of Carpenters and Joiners, the Associated Joiners of Scotland, the London Order of Bricklayers, the Manchester Unity of Bricklayers, the Operative Stonemasons' Society, the Operative Plumbers' Society, the National Society of Ship and House Painters, the Amalgamated Society of House Painters, the Amalgamated Society of Mill Sawyers and Wood-cutting Machinists, the United Builders' Labourers' Union, the Gasworkers' and General Labourers' Union, and the United Order of General Labourers'. The objects of the board are to adjust by conciliatory means all questions relating to the hours of labour, rates of wages, and working rules, and by mediation prevent strikes and lock-outs, and assist in the settlement of disputes that may take place in the building trades. In addition to the representatives from employes and workmen, there are also to be district committees, the numbers to be decided locally. Disputes are at present in progress among joiners and carpenters at Hull, Halifax, Newport (Mon.), Londonderry, Oswestry, and Fleetwood.

Leicester.—Sir William Markby, acting as Board of Trade arbitrator, held a protracted sitting on Monday afternoon and evening to settle the long-protracted dispute in the Leicester building trade. Six months ago the labourers applied for an advance in wages from 6d. to 7d. per hour, but offered to accept a halfpenny increase. This was refused, and 800 struck. The majority have remained out ever since, receiving 12s. weekly. The employers offered a farthing, but this was refused.

Leeds.—Mainly through the local branch of the Alliance Cabinet Makers' Union, the Leeds operatives have for some time past been endeavouring to obtain an increase of the minimum rate of wages from 7½d. to 8½d. per hour, and a working week of 52½ instead of 54 hours. Mr. J. O'Grady, general organiser of the union, states that with the shops doing the best class of work there had been little difficulty in obtaining a settlement. Some five, in which the lower class of furniture is turned out, however, have not conceded the claims, and the men employed therein have been brought out on strike. About 90 are affected.

Nottingham.—A strike commenced on Saturday morning, when upwards of a thousand plasterers laid down their tools in consequence of the masters employing bricklayers to do plastering. A similar dispute arose a few months ago, when the plasterers were locked out for about eighteen weeks, and the course adopted now by the men is the outcome of the employers failing to carry out their promise, given last May, not to employ bricklayers for this particular work. The masters and men are both firm.

Mr. A. R. Dean, managing director of A. R. Dean, Ltd., furniture dealers, Birmingham, has provisionally assented to become the Liberal candidate in opposition to Mr. Evelyn Cecil for the representation of Aston Manor.

At the Norwich Consistory Court on Friday application was made for a faculty for the erection of a screen with gates at Brockdish Church, in Norfolk. After examining the plans, which showed that a crucifix was to surmount the screen, Mr. Chancellor Blofeld decreed a faculty for the screen, but without gates, and said a cross must be substituted for the proposed crucifix. At the same court faculties were decreed in reference to improvements at St. Simon's and St. Jude's, Norwich, the erection of a stained-glass window at Salhouse, and the repairs at Lakenham.

CHIPS.

A memorial brass has been placed in the parish church of SS. Mary and Eanswythe, Folkestone, to the memory of the late vicar, Canon Matthew Woodward. The brass, surrounded by a black marble border, is sunk in the north end of the chancel floor, and represents a full-length figure of the late Canon holding a chalice in his hands. The work was executed by Messrs. Hart, Son, and Peard, of Drury-lane, W.C.

The works committee of the Edinburgh Water Trust unanimously resolved on Tuesday to advertise for offers for the completion of the contract for the Talla reservoir. The original contract by James Young and Sons amounted to about £163,000, and the amount of work certified is about £49,000, which includes the cost of providing the huts (£3,000) and of plant (£2,000). Roughly speaking, about three-fourths of the work still remains to be executed. The engineer reported that, as instructed by the trustees, he had seen Mr. John Best, and that he had made arrangements for carrying on certain urgent works, and had also arranged that Mr. Hill, C.E., Manchester, consulting engineer, should visit the works.

The new Central Park at Ilford was opened on Saturday afternoon by the chairman of the urban district council. The park, which consists of 47 acres, and has cost £12,000, contains a large lake, and is laid out with flower-beds and shrubberies.

The Shoreditch Vestry have completed a scheme for housing the artisan classes in Hoxton. Slum property has been cleared in Moira-place and Plumber's-place, and on the sites three blocks of dwellings, from designs prepared by Mr. Rowland Plumbe, have been erected. The blocks contain 75 tenements, with accommodation for 500 persons. The tenements are self-contained, and provided with cooking-ranges and coppers for washing.

Within the past few years St. Reynagh's Chapel, Banagher, has been overhauled and remodelled. The work was carried out by the late Mr. W. Hague, architect, of Dublin. The gables were pulled down and rebuilt, and the roof recast at heavy expense. The inside of the church is now being decorated and painted, Mr. Mark Quigly, of Birr, being the contractor.

The memorial-stone of a new mission-hall in Berners-street, Lozells, and in St. Paul's parish, Birmingham, was laid on Saturday. The building will be of two stories. The ground floor will be divided into class and reading rooms, suitable for use as a young men's club, while the mission-room proper will be above, and will accommodate 450 persons. The cost of building, which is being carried out by Messrs. Harley and Sons, Smethwick, from the designs of Mr. Daniel Arkell, of Birmingham, will be £2,184.

Mr. Pitcairn, oversman, has given his award in the arbitration between Dundee Tramways Company and Dundee Corporation in respect of the acquirement by the latter of the rolling stock of the former. Mr. John Waugh, Bradford, on behalf of the company, assessed the value of the stock at £8,000, while Mr. James Moore estimated for the corporation at £4,000. Mr. Pitcairn has made his award at £6,700.

The various industries connected with building operations in Calcutta seem, says the current issue of *Indian Engineering*, to be thriving, and the demands more than keep pace with the supply. In regard to lime, the market was never better than now, or the public better served. Brick-making is stagnant as regards quality, and there is a yearly increasing need for better bricks—machine-made, i.e., pressed and wire-cut. The labour question is a drawback, as there is much uncertainty, and wages are apt to take an unnatural rise.

The memorial-stones were laid at Lostwithiel on the 13th inst. of a United Methodist Free Church. The premises will comprise a chapel with accommodation for 450 people, vestries, a large schoolroom, and four classrooms. The cost will be something like £2,500. Mr. Sampson Hull, of Redruth, is the architect, and Messrs. Bassett and Smith are the builders.

The city council of Truro have resolved to call in Mr. Donald Cameron, C.E., of Exeter, to consider and report which of the schemes laid before them for the drainage of the city could best be utilised in conjunction with the septic tank system.

Mechanism has been installed in one of the steeples of St. Patrick's Cathedral, New York City, for ringing the chime of bells. There are nineteen bells, which vary in weight from 300lb. to 7,000lb. The mechanism for striking, says the *Scientific American*, consists of horizontal air cylinders, with piston-rods attached to central studs projecting below the centres of the clappers. The piston is only used for a stroke one way, the weight of the clapper returning it. The bells are operated by a keyboard which is in electrical connection with magnets controlling the valves of the air cylinders.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	6 10 0	,,	7 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 0 0	,,	9 0 0
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£7 0 0	to	£8 0 0
Cast-Iron Stanchions	7 0 0	,,	8 0 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 5 0	,,	5 10 0
Cut Clasp Nails, 3in. to 6in.	9 0 0	,,	10 0 0
Cut Floor Brads	8 15 0	,,	9 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
9/6	10/-	10/6	11/3	12/-	13/-	14/-	15/9	17/9	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	60p.c.
Water-Tubes	55
Steam-Tubes	50
Galvanised Gas-Tubes	45
Galvanised Water-Tubes	40
Galvanised Steam-Tubes	35

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 15 0	,,	17 15 0
Pig Lead, in 1cwt. pigs	16 0 0	,,	17 0 0
Lead Shot, in 28lb. bags	19 12 6	,,	20 12 6
Copper Sheets, sheathing and rods	92 0 0	,,	93 0 0
Copper, British Cake and Ingot	79 15 0	,,	80 15 0
Tin, Straits	148 15 0	,,	149 15 0
Do., English Ingots	152 0 0	,,	153 0 0
Spelter, Silesian	22 15 0	,,	23 0 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	5 0 0	,,	6 15 0
,, Oak	,, ...	4 2 6	,,	6 15 0
,, Birch	,, ...	2 12 6	,,	4 10 0
,, Elm	,, ...	4 12 6	,,	5 5 0
,, Ash	,, ...	3 15 0	,,	4 15 0
Dantsic and Memel Oak	,, ...	3 0 0	,,	4 0 0
Fir	,, ...	2 5 0	,,	3 5 0
Wainscot, Riga p. log	,, ...	3 2 6	,,	5 10 6
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£20 15 0	to	£27 5 0
,, 2nd	15 15 0	,,	19 0 0
,, 3rd	9 15 0	,,	11 5 0
Canada Spruce, 1st	9 5 0	,,	11 0 0
,, 2nd and 3rd	7 10 0	,,	8 15 0
New Brunswick	7 10 0	,,	8 5 0
Riga	8 5 0	,,	9 5 0
St. Petersburg	10 0 0	,,	16 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 10 0	,,	10 10 0
White Sea	11 15 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 11 6	,,	£0 15 6
2nd ditto	0 7 0	,,	0 11 3
Other qualities	0 5 3	,,	0 8 9
Staves, per standard M :—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£20 10 0	to	£20 15 0
Rapeseed, English pale	,, ...	24 5 0	,,	24 10 0
Do., brown	,, ...	22 0 0	,,	23 0 0
Cottonseed, refined	,, ...	17 15 0	,,	19 5 0
Olive, Spanish	,, ...	32 0 0	,,	32 10 0
Seal, pale	,, ...	18 10 0	,,	19 0 0
Cocoanut, Cochin	,, ...	28 15 0	,,	29 5 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	23 0 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

LIST OF COMPETITIONS OPEN.

Talgarth, Hay—Sewerage and Water Supply	£25	Charles Griffiths, Clerk, Hay, Brecknock	Sept. 25
Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	" 30
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	Oct. 17
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—

LIST OF TENDERS OPEN.

BUILDINGS.

Londonderry—Two Houses, Bishop-street	P. Campbell	J. P. M'Grath, Architect, 28, Carlisle-road, Londonderry	Sept. 23
Dunmow—Horse-Boxes at Barnston Hall Farm, Barnston		Wade, Wix, and Wade, Architects, Dunmow	" 23
Pontypridd—Workhouse and Boundary Walls at Llwynypia	Guardians	E. C. Spickett, Clerk, Pontypridd	" 23
Wickeridge—New Wing to House		G. E. Allen, Wickeridge, near Ashburton	" 23
Bishopstawton—Dwelling-House and Offices	School Board	G. C. Smyth-Richards, Architect, Barnstaple	" 23
Rotherham—Church at Northfield		E. I. Hubbard, Architect, Moorgate-street, Rotherham	" 23
Middlesbrough—Premises	John Forbes	R. Lofthouse and Sons, Architects, 62, Albert-road, Middlesbrough	" 23
Bradford—Four Houses, Tong-street		William Bland, Boot and Shoe Manufacturer, Bradford	" 23
Leeds—Business Premises, Queen's-square	H. Clarkson	Butler, Wilson, and Oglesby, Architects, 12, East Parade, Leeds	" 23
Tudhoe—Repointing House at East Howle Board School	School Board	Sam Adams, Clerk, 56, North Bondgate, Bishop Auckland	" 23
Elgin—Alterations on Steading, Wester Clackmaris		A. and W. Reid and Wittet, Architects, Elgin	" 25
Hove—Two Fireplaces and Chimney Stack at Town Hall		The Borough Surveyor's Office, Town Hall, Hove	" 25
Rathgar—Banking Premises	Banking Company, Ltd.	Vincent Craig, Architect, 5, Lombard-street, Belfast	" 25
Consett—Four Houses, Belle Vue-terrace		Robt. Robson, Front-street, Leadgate	" 25
Elgin—Alterations on Steading, Wester Coxton		A. and W. Reid and Wittet, Architects, Elgin	" 25
Ballyshannon—Repairs to Church	Rev. J. Baillie	T. Elliott, Architect, 37, Darling-street, Enniskillen	" 25
Llanelly—Engine-House, &c.		Colin P. Fowler, Resident Engineer, Harbour Office, Llanelly	" 25
Clones—Schools		T. Elliott, Architect, 38, Darling-street, Enniskillen	" 25
Tantobie—Six Houses	Co-operative Society, Ltd.	T. Ernest Crossling, F.I.A.S., Architect, Stanley, R.S.O., Durham	" 25
Scarborough—House at Scalby		J. Caleb Petch, Architect, Bank Chambers, Scarborough	" 25
Leek—Galvanised-Iron Shed	Urban District Council	John Myatt, Town Surveyor, Town Hall, Leek, Staffs	" 25
Halifax—Workshops, Shay-lane, Holmfield		F. Fielden, Architect, 7, Fountain-street, Halifax	" 25
Carlisle—Six Houses, Greystone-road	John Whitfield	Johnstone Bros., Architects, 39, Lowther-street, Carlisle	" 25
Treorchy—Calvanistic Methodist Chapel		The Rev. E. Beynon, 2, Crosswood-street, Treorchy, Wales	" 25
West Bromwich—Additions at Schools	School District Managers	Thomas Rollason, Architect, High-street, West Bromwich	" 25
Bulwell—Sixteen Houses, Quarry-road		Fred. C. Martin, C.E., Architect, Angel-row, Nottingham	" 25
South Shields—Additions to Westoe-road Board School	School Board	Fred. Rennoldson, Architect, 37, King-street, South Shields	" 26
Walthamstow—New Out-Offices at Gamuel-road Schools	School Board	W. A. Longmore, F.R.I.B.A., Hoe-street, Walthamstow	" 26
Cork—Offices, &c., Kemp-street	Lunham Bros., Ltd.	Robert Walker and Son, Architects, 17, South Mall, Cork	" 26
Elgin—Dwelling-Houses, Moray-street		Sutherland and Jamieson, Architects, Elgin	" 26
Haverfordwest—Additional Classroom to Barn-street School	School Board	D. E. Thomas, Victoria-place, Harverfordwest	" 26
Loch Awe—House	A. B. Bach	Peddie and Washington Browne, Archts., 8, Albyn-pl., Edinburgh.	" 27
Paddington, W.—Alterations to Woodfield House, Woodfield-rd.	Guardians	F. J. Smith, Architect, Parliament Mansions, Victoria-street, S.W.	" 27
Salford—Slating Roofs at Lodging-House, Bloom-street		The Borough Engineer's Office, Town Hall, Salford	" 28
Ormskirk—Alterations at Workhouse	Guardians	J. Dod, Architect, 16D, Exchange Buildings, Liverpool	" 28
Staines—Infant School, Stanwell-road	School Board	Murray & Dibdin, Architects, 5, Hurstbourne-rd., Forest Hill, S.E.	" 28
Longtown—Villa Residence		G. Armstrong, Architect, 24, Bank-street, Carlisle	" 28
Chopwell—Houses in Flats	Robert Armstrong	Badenoch and Bruce, Architects, 55, Pilgrim-st., Newcastle-on-Tyne	" 28
Salford—Encaustic Tiling at Town Hall		The Borough Engineer's Office, Town Hall, Salford	" 28
Kinsale—Additions to Ballymartle Dispensary	Guardians	Richard Evans, C.E., 53, South Mall, Cork	" 28
Chelmsford—Schoolroom and Offices, Hall-street		Chas. Pertwee, A.R.I.B.A., Bank Chambers, Chelmsford	" 29
Aberystwith—Additions to Ocean View, Marine-terrace	Mrs. Kensit	Hipkiss and Bassett, Architects, Terrace-road, Aberystwith	" 29
Elgin—Additions to Golf Clubhouse, Stotfield		A. and W. Reid and Wittet, Architects, Elgin	" 29
Hereford—Renovations at Sergeant's Cottage	Standing Joint Committee	Alfred Dryland County Surveyor, Hereford	" 29
Margate—Coastguard Buildings	Admiralty	Director of Works Dept., Admiralty, 21, Northumberland-av., W.C.	" 29
Arundel—Billiard-rooms &c., at the Victoria Institute		Wheeler and Lodge, Architects, Horsham	" 30
Lochboisdale—Additions to Castlebay School	Barra School Board	J. Hill, Banker, Lochboisdale, Scotland	" 30
King's Lynn—Workshop and Stores at Gayton Waterworks	Waterworks Committee	H. J. Weaver, C.E., Town Hall, King's Lynn	" 30
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	" 30
Pontefract—House and Outbuildings, Ackworth-road	J. E. Poppleton	Tennant and Bagley, Architects, Ropergate, Pontefract	" 30
Cardiff—Branch Library at Grangetown	Corporation	E. M. Bruce Vaughan, Architect, St. Mary-street, Cardiff	" 30
Bodmin—Additions to Town Arms Hotel	Walter Hicks	T. H. Andrew, Architect, 1, Trevarrick-villas, St. Austell	" 30
Cymmau—Alterations at C.M. Chapel		William Lewis, Cymmau, Wales	Oct. 1
Erith, Kent—Central Schools (1,260), West-street	School Board	W. Egerton, Architect, 12, Queen's-road, Erith, Kent	" 2
Culoville—Two Cottages	Gt. Northern (Ireland) Railway Co.	The Co.'s Engineer-in-Chief, Amiens-street Terminus, Dublin	" 2
Luton—Engine House and Engine Foundations	Waterworks Company	J. Taylor, Sons, & Santo Crimp, 27, Great George-st., Westminster	" 2
Hastings—Stabling, Loose Boxes, &c., at Rock-a-Nore	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	" 2
Burton-upon-Trent—Additions to Mosley Cottages	Corporation	George T. Lynam, Boro' Engineer, Town Hall, Burton-upon-Trent.	" 2
Sowerby Bridge—Nine Houses		Medley Hall, Architect, 29, Northgate, Halifax	" 2
Handsworth, Staffs—Stabling, &c.	Urban District Council	E. Kenworthy, A.M.I.C.E., Council House, Handsworth, Staffs	" 2
Colwall—Station Buildings and Verandahs	Great Western Railway Co.	The Company's Engineer, Gloucester Station	" 3
London, W.—Station, Notting Hill and Ladbroke-grove	Gt. Western & Metrop. Jt. Railways	The Engineer, Paddington Station, W.	" 3
Basingstoke—Fifteen Cottages, Flaxfield-road	Working Classes Committee	George Fitton, Borough Surveyor, Town Hall, Basingstoke	" 3
Omagh—Spires to Church	Very Rev. Monsignor M'Namee	W. Hague, Architect, 50, Dawson-street, Dublin	" 3
Lewes—Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	" 3
Didcot—Thirty Cottages	Great Western Railway	The Company's Engineer, Reading Station	" 3
Bucknall—Enlargement of Classroom	School Board	Arthur E. Applewhite, Clerk, Bucknall, Lincoln	" 4
Hastings—Chimney Shaft (100ft. high) near Brede Bridge	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	" 5
Hastings—Alterations to Electric Light Works	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	" 5
Ynysybwl, Wales—Cookery Classroom at Trerobart School	Llanwonno School Board	Arthur O. Evans, Architect, Pontypridd	" 6
Dublin—Additions to the National Gallery		T. N. Deane and Sons, Architects, 3, Upper Merrion-street, Dublin	" 6
Whitchurch—Repairs at Vicarage and Glebe		The Vicarage, Whitchurch, Devon	" 7
Cardiff—Roath Branch Library	Corporation	Teather and Wilson, Architects, Queen-street, Cardiff	" 7
Birkenhead—Electricity Generating Station, New Chester-road	Corporation	Chas. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	" 10
West Kensington—Post-Office Savings Bank	H.M. Commissioners of Works	J. Tanner, H.M. Office of Works, Storey's Gate, S.W.	" 10
Barking—Greenhouse at Recreation-Ground	Urban District Council	C. J. Dawson, F.R.I.B.A., Public Offices, Barking	" 10
Portslade—Engine and Boiler Houses, &c., at Pumping Station	Brighton Town Council	Francis J. Tillstone, Town Clerk, Town Hall, Brighton	" 10
Tooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	" 11
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	" 12
Leicester—Cemetery Buildings on Gilroes Estate, Groby-road	Corporation	Goddard and Co., Architects, 6, Market-street, Leicester	" 13
Kingswood Hill—Engine-House at Pumping Station	West Gloucestershire Water Co.	E. D. Marten, M.I.C.E., The Birches, Codsall, Wolverhampton	" 16
Southwark, S.E.—Additions to Workhouse, Parish-street	St. Olaves Union Guardians	Newman and Newman, Architects, Tooley-street, S.E.	" 17
Isleworth—New Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 18
Brentford—Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 18
Morecambe—Bank Premises	Bank of Liverpool, Ltd.	Cressey & Keighley, Archts., Bank Chmbrs, Euston-rd., Morecambe	—
Pontypool—Shop, George-street		Bevan and Co., Ltd., Furnishers, Pontypool	—
Bradford—House in Nab Wood		H. and E. Marten, Architects, 5 and 7, Charles-street, Bradford	—
Long Eaton—Laundry Buildings	Long Eaton & Dist. Steam Laundry	Frederick Ball, Architect, 23, King-street, Nottingham	—
Clacton-on-Sea—Additions to Royal Hotel		A. Sykes, 45, Finsbury-pavement, London, E.C.	—
Kirk Michael—Restoration of Parish Church Organ		The Secretary of Committee, Kirk Michael, Isle of Man	—
Doncaster—House and Buildings at Grammar School	Trustees	R. and W. Dixon, Architects, Barnsley	—
Barnet, Herts—Houses on Willenhall Park Estate		G. D. Martin, Architect, 3, Pall Mall East, S.W.	—
Girlington—Two Houses, Kensington-street		G. C. Gymble, Architect, Parkinson's Chambers, Bradford	—
Newport, Mon.—Mineral Water Factory & Stores, Mountjoy-rd.	William Hancock and Co., Ltd.	Watkins and Brown, Architects, 156, Dock-street, Newport, Mon	—
Banavie—Additions to Hotel		Cameron and Burnett, Architects, Academy Buildings, Inverness	—
Keighley—House and Shop, North-street		John Judson and Moore, Architects, York Chambers, Keighley	—
Southwold—Cottage		J. Doddington, New Inn, Yoxford, Suffolk	—
Northampton—Factory, St. James's-end	A. E. Marlow	Mosley and Anderson, Twentieth Century Chambers, Northampton	—
Cartmel—Alterations to Grammar School		Settle and Farmer, Architects, Ulverston	—
Burgate—Residence		Fred Bath, F.R.I.B.A., F.S.I., Architect, Salisbury	—
Menston—Additions to Residences		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—
Coxlodge—One Hundred Cottages	Burradon and Coxlodge Coal Co.	The Coxlodge Colliery Offices, Gosforth	—
Kendal—Nine Houses, Burnside-road		John Hutton, M.S.I., Architect, Kendal	—

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IMPERFECT EXECUTION.

"TAKE most pains with the best material," says Ruskin—a maxim that may profitably be remembered by the artist, especially by those who are apt to throw away the highest effort on the meanest subjects. The contrariwise is also true in another sense. We are continually seeing the least pains taken with the execution of designs that have cost their authors much study and labour. Many of our most elaborate and costly buildings have been constructed of perishable stone, or have come to grief by the yielding of a bad foundation or the collapse of a girder. Even the painter of talent has sacrificed his reputation by the use of inferior pigments. But few of our buildings exhibit this consistency — the carrying to completion of a good design; it somewhere fails. Is not this inconsistency due to the hurry of building?—a clever idea is spoilt by being contracted for by the lowest bidder; a good design is lost upon us. Is not the want of sincerity the fault of most modern works? We seek for an explanation.

How frequently the most correct science fails by an imperfect application or a faulty experiment, and the scientific constructor is frustrated in his work through a defective execution. In theory, a number of accurately cast iron columns with planed caps and bases will give the most perfect result, the centre of pressure being truly placed; but how often imperfect workmanship will render a series of these superimposed columns abortive, and the whole collapses! Just an unequal casting, or shrinkage on one side, or an unevenly planed bed, will cause the failure. A stone pillar of ample size has often been cracked or crushed through an inaccurate squaring of the beds, or the want of a thin layer of lead or pine to equalise the pressure. As with physical matters, so with the success of design. It is a matter largely of execution, of a true and faithful rendering of the spirit of the design, of the accuracy displayed in interpreting the architect's intention, of a careful employment of the material, of a sympathetic handling and workmanship.

The most learned theorist of construction is often the least qualified through various circumstances to make a successful builder. He has not had a practical training; his ideas are derived from treatises and experiments in the classroom; his knowledge of stone, timber, and iron are imperfect, because they have not been supplemented by workshop experience. We can multiply instances of the uselessness of a knowledge of stresses and strains to a bridge or roof builder. How many iron girder or rib bridges designed on mechanical principles with its stresses proportioned to external "dead" and "live" loads have failed through a defective joint—to punched or drilled bars and flanges, even to weak riveting! These minor defects have rendered the niceties of calculated stresses absolutely of no value whatever. The practical constructor who has ignored these refinements of design, but has allowed a larger margin of strength in his web and flanges, has erected structures that have withstood the heaviest working loads.

Can we not appeal to the builders of our great stone and brick structures of Roman and Mediæval times? Without paucity or stint of material they erected edifices that have withstood the disintegrating action of weather, of time, and even of earthquake for centuries. Massive walls and buttresses, needlessly thick and deep according to theory, were built to sustain vaults of great weight and thickness. Superfluous strength, no doubt, they possessed; but it was better than collapse. The system of inert stability which characterised the Romanesque structure was superseded by the Gothic system. The principle of the equilibrium of forces was introduced; but great depth of the buttresses at intervals took the place of the continuous solid wall. So here, again, we have an ample margin of strength. Viollet-le-Duc speaks of this framework of masonry rendered solid by the "combination of oblique resistances or of vertical weights" and enveloped in a garment which clothes it. Every edifice has its skeleton and its sinews; it is a structure of stone independent of the garment that covers it. The skeleton is rigid, as we see in such a building as the choir of Notre-Dame at Chalons-sur-Marne. Look at the deep buttresses between the semicircular chapels, the two rows of inner piers which form the apse or chevet of this beautiful church. Even when experience had taught the Mediæval builders to erect lighter structures, care and skilful execution went hand in hand with the design.

We take later periods with the same result: the building of the era known as the Renaissance; the work of our own Classic revivalists of the 17th and 18th centuries; even the Georgian period of our English architecture with all its faults and heaviness. No one will deny that the buildings of that age were at least honest and sound in construction and workmanship. Every builder and architect who has had to restore or rebuild houses or public edifices of this date is aware of the solidity and soundness of the workmanship, showing that the workman had not lost all his interest in his craft. We look with admiration on the brickwork, the joinery, the solid doors, the hand-wrought mouldings, the plaster work of these buildings; our students still make drawings from measurement of these houses of our grandfathers, where they still find lingering the "perfection of work and personality in the workman."

We have lost all this care and skilfulness in execution. Why? Is it because, as Emerson says, we are "reckoned in the gross," or because we have grown more careless? The specification and supervision of the architect have an intimate bearing on this question of execution. Are we sure they are what they were once, that the specification and quantities are really part of the contract, or treated as superfluous documents not to be enforced; that the superintendence of the architect is a mere perfunctory duty delegated to someone else? The latter questions must be answered in the affirmative. To some extent machine-turned-out masonry and joinery is responsible in the answer to the question. Do we see the design *in* the execution? Is the execution—a continuation of the architect's intention—the honest fulfilment of the design on paper, instead of being something else entirely—something that the contractor and workmen have given us, that the artist has had nothing to do with? We look at our commercial buildings, our great shops, restaurants, warehouses, our domestic dwellings; they are more or less faint representations of what they are intended to be; everything is scamped or pinched, the ornamental details meagre. Let us search for a remedy.

For thoroughly honest and consistent execution the architect has to rely upon those who work under his control. He must get a body of skilled, conscientious builders, masons, bricklayers, carpenters and joiners, plasterers, and smiths to carry out his details. He fails because he has not such a body of craftsmen. He gives a design for a piece of stonework, but the mason seeks to find "short cuts"; the substance or depth of the bed is reduced to save a few inches of stone, also the projection of a cornice or a moulding, with the result that the appearance is spoilt, the work looks niggardly and thin. Do we not find it so in such details as window tracery, moulded work, quoins, buttress weatherings? And is the bricklayer less unscrupulous? Does he not rob the proportions of a chimney-shaft by omitting a few courses, introduce patterns of bricks that happen to be in stock for specially-made moulded courses? Does he not spoil his work by following what he thinks is easier bond in setting out the windows? How often the carpenter or joiner completely travesties the meaning of the architect's detail by reducing the thickness of the material, by putting in stock in trade or machine-made mouldings for those designed, and by altering some proportion of the detail upon which the architect relied for his effect! All these things are of common occurrence, especially when the work is done by contract, or left to a clerk of works or a foreman to see carried out. Sometimes, of course, the architect is to blame for not making details, or neglecting the work during its progress, and it cannot be laid to the workman's charge that he has simply carried out the work in the way he has always been in the habit of doing. These are all strong reasons why building craftsmen should, if possible, so master their arts that they may, each in his own way, contribute to the design by taking an individual interest in the details. It will be some time before this happy state of things will be reached. One author of a recent paper read before the Architectural Association proposed that the decorative work required in a building, instead of being handed over to commercial firms, might be intrusted to the various men who have made these crafts their own;—a good plan if we could bring back the traditions and system of the Middle Ages, not otherwise. Imagine a number of joiners or plasterers let loose in a building to carry out the design of an architect. What a mixture of pieces of workmanship would be the result! On the other hand, how can we expect an architect trained in the modern school to obtain more than a general and very superficial knowledge of the trades? The man who attempts to design and superintend all the details of workmanship which went to make the building is, at least, rather presumptuous, so that the question cuts both ways. But there is this difference: the designer's thought is not seen, the craftsman's work is visible. With all its imperfections it stands a lasting honour or discredit to the architect's design. In truth, the relation of architecture to workmanship must be understood better than it is if our buildings are to be worthy expressions of requirements. Harmonious co-operation is impossible until the architect and workman understand one another, both in regard to their knowledge of and treatment of material, and in that sense of expression which lies at the bottom of all art.

First they must both be educated in the right employment of material. While one regards a mass of stone or timber as ponderable substances that can be cut and shaped in any manner, and the other has learned its nature through the handling of tools, it is impossible that both can regard the material in the same manner. An agreement as to the mode of converting materials is absolutely necessary to a right understanding of design—it is the initiative of good workmanship. When an architect shows a stone detail worked one way, and the mason works it another, we cannot expect any satisfactory result. In many contracts the architect is willing to compromise with the builder, to allow him to vary in technical points, to use stock patterns. Sometimes he does so from a generous motive, the price being very low; but these concessions are often owing to a lack of practical experience on the part of the designer. Discretion may be the better part of valour.

Secondly, there must be co-operation in points of design. It is a great help if the mason or joiner knows a little of "art"—we mean as an education, something of style; if he does not, he cannot properly interpret a drawing. No properly-trained mason would substitute a Gothic member for a Classic moulding; nor would it be possible for a joiner who had been taught in an elementary school of design, who had drawn mouldings, to select a machine-run "ovolo" or "cyma recta," for a moulding supplied by the architect. There is much to be said in favour of the French and Continental course, in which the architect engages his own craftsmen, who tender at the schedule of prices adopted by the civic authorities, and who, as a consequence, are in touch with the architect's style and individuality.

When our technical schools shall have taught the various tradesmen engaged in building the elementary principles of good art, and have exercised their capabilities of design, we may expect a more perfect rendering of the architect's ideas. If he wants his design carried out well and as he intended it should be, he has to obtain the assistance of men who have either a special aptitude for their work or have made the trade their own. The provision of amounts for particular crafts in the contract is the only way now open to him, and the aid afforded by underletting portions of the work. By these means, at least, he has some control over the work, and he is more sure of obtaining a sympathetic interpretation of his ideas.

ESTIMATES.—XXIII.

IRONMONGERY—SPECIAL FITTINGS.

THE estimator of this trade must take a good deal of his information second-hand. He cannot analyse and dissect the items of material and labour as he can do in joinery and mason's work; but he must make himself acquainted with articles, catalogues, and trade-lists, and the prices quoted in them. Such things as wrought-iron and brass butts for various purposes, including in the price screws and profit, but not fixing, which are taken with the doors or other woodwork, require a knowledge of ironmongers' price-lists. The quantity required, whether great or small, has to be considered in the pricing. In small jobs, where the retail ironmonger is in request, the price is high, as small quantities bear a larger proportion to the original cost. A large quantity of the ironmongery in the market is low in price and poor in quality, and the weight is reduced to the lowest extent compatible with strength. Most contractors buy their ironmongery in large quantities at the wholesale houses, such as Hobbs and Co.; Young and Marten; Hart, Son, Peard, and Co.; Melhuish, Sons, and Co.; J. H. Boobbyer and Sons. In quantities butts and other ironmongery are often insufficiently described: the number or special name should be specified, as given in the trade-list, to obtain the correct price.

For ironmongery of a special quality the prime cost of each article should be stated; the best course is to ask a well-known firm of ironmongers to affix their prices to the articles; the sum thus produced being made a provision in the quantities. Otherwise the number and price of any articles should be stated. When this is the case, the estimator has no further trouble then to quote the price put down; but in a large number of cases the estimator has to append his own prices. The net price having been found, add for fixing, if not taken with the joinery, screws and profit. In our priced items, doors, &c., the hanging includes the butts in most cases. In pricing butts, a sum per inch is often charged, say, 2d. per inch including fixing and profit, 3d. for brass butts; for hardwood 25 per cent. more than for deal fixing is charged.

As useful in pricing cut steel, wire, and wrought nails we quote a few figures from the price list of a large firm of merchants and manufacturers. They are net prices :—

Cut Steel clasps :—

Size...	1in. s.	d.	1¼in. s.	d.	1½in. s.	d.	1¾in. s.	d.	2in. s.	d.	2½in. s.	d.
1cwt. ...	13	9 ...	12	9 ...	10	9 ...	10	3 ...	9	9 ...	9	3
56lb. ...	7	3 ...	6	9 ...	5	9 ...	5	6 ...	5	0 ...	5	0
28lb. ...	3	9 ...	3	6 ...	3	0 ...	2	10½ ...	2	9 ...	2	9
7lb. ...	1	3 ...	1	3 ...	1	0 ...	1	0 ...	0	10½ ...	0	10½

Cut steel floor brads :—

Size....	2in.		2¼in.		2½in.		2¾in.		3in.		3½in.	
1cwt. ...	9	0 ...	8	9 ...	8	6 ...	8	6 ...	8	6 ...	8	6
56lb. ...	4	9 ...	4	9 ...	4	6 ...	4	6 ...	4	6 ...	4	6
28lb. ...	2	6 ...	2	6 ...	2	6 ...	2	6 ...	2	6 ...	2	6
7lb. ...	1	0 ...	0	9 ...	0	9 ...	0	9 ...	0	9 ...	0	9

Fine wrought clasp :—

Size....	1in.		1¼in.		1½in.		2in.		2½in.		3in.	
1cwt. ...	60	0 ...	47	0 ...	40	0 ...	32	0 ...	27	0 ...	25	0
56lb. ...	31	0 ...	25	0 ...	22	0 ...	17	0 ...	14	6 ...	13	6
28lb. ...	16	0 ...	14	0 ...	11	6 ...	9	0 ...	7	9 ...	7	3
7lb. ...	4	6 ...	4	0 ...	3	3 ...	2	6 ...	2	3 ...	2	0

We also select numbers and prices of a few useful sizes of iron wood-screws from Young and Marten's gross standard list :—

1in.			1½in.			2in.			2½in.			3in.			4in.			
No.	Price per gross.		No.	Price per gross.		No.	Price per gross.		No.	Price per gross.		No.	Price per gross.		No.	Price per gross.		
	s.	d.		s.	d.		s.	d.		s.	d.		s.	d.		£	s.	d.
4	1	0½	6	1	6	8	2	0	10	2	8	12	4	0	16	0	8	1
8	1	3	10	1	9	13	3	0	12	3	4	16	5	10	20	0	11	6
15	2	3	15	3	0	18	4	9	18	5	6	22	10	2	25	0	15	6
19	3	7	21	5	2	22	6	4	24	8	8	26	13	6	32	1	12	0

The following constants for fixing in deal may be useful :—

	Days of a joiner.	s.	d.		Screws. s.	d.
2½in. butts, per pair	·022 =	0	2¼	...	0	1
3½in. do. do.	·027 =	0	2¾	...	0	1¼
4in. do. do.	·033 =	0	3¼	...	0	2
5in. do. do.	·037 =	0	3¾	...	0	2¼
15in. cross garnet hinges	·053 =	0	5¼	...	0	1½
3in. to 6in. tower bolt	·043 =	0	4¼	...	0	1
9in. to 12in. do.	·065 =	0	6½	...	0	1
Flush bolts, per inch	·008 =	0	0¾	...	0	0¼
Espagnolette bolts, per inch	·006 =	0	0½	...	0	0¼
3in. cupboard locks.....................	·085 =	0	8½	...	0	1
Rim locks	·095 =	0	9½	...	0	1
Mortise locks.............................	·252 =	2	1¼	...	0	1
Kaye's locks	·286 =	2	4½	...	0	1
Rim dead locks...........................	·095 =	0	9½	...	0	1
10in. drawback locks	·170 =	1	5	...	0	1
Door-knob..................................	·033 =	0	3¼	...	0	0
Night latch.................................	·085 =	0	8½	...	0	0
Knocker	·126 =	1	0½	...	0	0

Hinges should be selected with relation to the weight of door or casement, and for superior doors, especially those of considerable weight, butts with steel washers should be used instead of all brass. "Egg-and-cup" hinges are used for heavy doors, as the bearing surfaces are larger; sometimes gun-metal is used. Brass-screws in thick wood should have brass cups, especially to all hardwood casings or fixings.

Brass screws should be used for all good sash-frames and fixings of stops and mouldings, as they do not rust, and their price is about three times that of iron screws. English machine-made screws are sold by the gross, and have sharp points and good finish.

Our sketches show the distinguishing characters of nails in general use. No. 1 is a cut steel clasp; 2, a cut-steel floor-brad; 3, a fine wrought clasp nail; 4, a fine-cut joiner's brad; 5, a countersunk town clout; 6, a slating nail, copper; 7, a wire nail; 8, patent steel flat-front rose; 9, a galvanised-wire slate nail.

No. 22. Pairs 4in. iron butts and fixing.

	£	s.	d.
Cost of butts per pair, say	0	0	9
Screws..	0	0	2
Fixing, ·033	0	0	3¼
	0	1	2¼

Say 1s. 2d. per pair.

The fixing in most cases is included with the doors. There would be 16 screws per pair of 4in. butts.

No. 8. Pairs of 2½in. cast-iron butts.

The cost of these is given in Laxton at 6d. per pair. Add for screws 1d., and profit, say another 1d. Fixing is taken with the doors. For a large quantity the price may be put at 5d. per pair, or 7d., including screws and profit.

No. 10. Pairs 2½in. wrought-iron butts.

These are priced in one list at 8d. per pair including screws, though many price them at 6d. or 4d. for butts, 1d. for screws, and 1d. for profit. It depends on quantity.

No. 18. Pair 3in. wrought-iron butts.

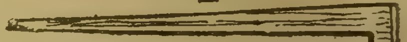
Price these at 2d. more per pair, or, say, 9d. including screws and profit. For a large quantity 8d. would be sufficient.

No. 8, Pair 3in. brass butts, medium strength.

These are made in three qualities, "light," "medium," and "strong," and they vary not only in length, but in width. The width generally used is 1¼in. The medium quality of this size may be priced at 1s. 2d. per pair, including iron screws.

1

2



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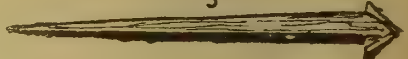

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5

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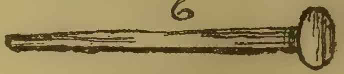

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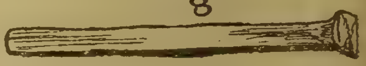

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No. 4. Pair 3in. brass butts of strong quality.

Add another 9in. per pair.

No. 4. Pairs of 4in. brass rising butts.

These are made extra strong, and are priced from 6s. 6d. to 7s. 6d. in one list per pair, including screws; but the width regulates the price.

	£	s.	d.
Say cost of butts, including screws	0	8	0
Extra labour, fixing	0	0	4
	0	8	4
Profit 10 per cent.	0	0	10
	0	9	2

No. 4. Pair 4in. brass butts, strong, and of best finish.

A strong suit will cost about 4s. 6d. per pair; but for a lighter kind 3s. may be put.

	£	s.	d.
Cost of brass butts	0	4	6
Screws	0	0	2
Fixing extra, say	0	0	6
	0	5	2
Add 10 per cent. profit, say	0	0	6
	0	5	8

No. 4. Ditto, ditto, with steel washers, 3½in.

	£	s.	d.
Say we put butts down at	0	6	0
Screws	0	0	2
Fixing extra, say	0	0	4
	0	6	6
Profit	0	0	7
	0	7	1

Ditto, ditto, strong and heavy, polished, and lacquered.

Say, 6s. with screws, and profit 6d. extra, 6s. 6d. a pair. If these have steel washers, add 1s. 6d.

No. 6. Pairs 22in. strap hinges and bolts.

These will cost about 4s. per pair. They would weigh about 11lb. the pair at 4½d. per pound.

	£	s.	d.
Cost of hinges, 11lb. per pair, say	0	4	0
No. 8 3in. bolts and screws, say	0	1	9
Fixing, &c.	0	2	6
Including profit	0	8	3

No. 2. Pair of good gate hinges, 2ft. long.

These are priced at 9s. per pair.

	£	s.	d.
Gate hinges	0	9	0
Fixing, including bolts and screws, to posts, say	0	8	0
	0	17	0

No. 12. Pairs of strong cast brass hinges, size when opened, 4in. by 2⅞in.

The cost of these in Young and Marten's list is given at 24s. per dozen pair. Add screws and profit.

	£	s.	d.
Say, per pair	0	2	0
Screws and extra labour	0	0	3
Profit	0	0	6
	0	2	9

No. 4. Pair of extra strong polished cast brass hinges, double steel washered, size when open 4in. by 4¼in.

These can be had at 12s. per pair, adding screws, &c.

No. 2. Pair polished brass rising butts of best quality upon hardened steel bearings, size 4in. by 3in.

Put these down at 13s. 6d, per pair, and add screws and fixing, say, 14s. per pair.

No. 2. Pair of polished brass projecting hinges, with extra strong double steel washers 5in. by 5in.

These are priced at 18s. per pair in Young and Marten's list. Add for screws, say, 4d. These hinges would take about twenty 2in. screws per pair. No. 6 to 8 countersunk holes are made in each hinge, or 12 to 16 in the pair.

No. 5. Pairs of 15in. cross-garnet hinges.

These are sold at about 1s. 6d. each.

	£	s.	d.
Say, cost is	0	1	6
Screws	0	0	1½
Fixing, &c., say	0	0	9
	0	2	4½

No. 4. Pair 18in. extra strong ditto.

Put these down at 2s. each, including profit, screws, and fixing, say, 3s. 4d. Weighty cross garnets, from 18in. upwards, may be priced at 6d. per lb.

No. 4. Pair welded water-joint hinges, 18in. long.

Price this at 3s.

No. 2. Pairs wrought-iron strap hinges, 18in. long, of 2in. by ⅝in. iron, with back flaps and plates, fixed with screws with countersunk heads.

As an approximate guess, this may be valued at 45s., including screws and fixing.

No. 6. Pair 3½in. brass butts, strong quality, 2½in. wide, and fixing.

Strong cast-brass hinges may be had at 18s. per dozen pair. Fixing per pair would be, by constant ·027, equal to 2¾d. per pair, and screws, say, 1½d., or—

	£	s.	d.
Six pair of brass butts, at 18s. a dozen..	0	9	0
Fixing, at ·027, six pair, say	0	1	4
Screws, say	0	0	1½
Cost six pair	0	10	5½

Ditto, 4in. strong brass butts, 3in. wide, and fixing.

These are priced at 24s. per dozen pair; fixing, at ·033, would be 3¼d. a pair; screws 2d.; or, per pair, 2s., fixing 3¼d., screws 2d. = 2s. 5¼d. per pair.

No. 2. Monkey-tailed bolts, 5ft. 6in. long, p.c. 7s.

	£	s.	d.
Cost of bolt	0	7	0
Screws	0	0	1
Fixing	0	1	0
	0	8	1
10 per cent. profit	0	0	10
	0	8	11

Say 9s.

No. 12. 10in. bright barrel-bolts.

The price of a best barrel-bolt is 10d. to 1s. each, screws 2d. fixing 6d. = 1s. 6d. Ordinary medium quality bolts are sold at 7d. each, or 1d. per inch, subject to a discount.

No. 4. 12in. ditto.

These are priced at 1s. 1d. each.

	£	s.	d.
12in. bolt, cost, say	0	1	0
Screws	0	0	1½
Labour, fixing	0	0	4
	0	1	5½

No. 2. 9in. brass barrel-bolts.

The price for a strong bolt of this length is 4s. 6d., fixing 6d., or 5s. each; for a larger quantity a reduction may be made of 1s.

No. 6. 4in. brass barrel-bolts.

These may be put down at 1s. 2d. each if of medium quality, and if strong 2s. each.

No. 4. 10in. brass flush bolts, ¾in. wide.

Price these at 3s. each, and fixing at, say, ·008 per inch, say ¾d.

	£	s.	d.
Cost of bolt	0	3	0
Fixing, at ¾d. per inch	0	0	7½
Screws	0	0	1½
	0	3	9

No. 2. 4in. necked bolts.

Price at 4d. each, fixing screws ½d.

No. 2. ⅞in. malleable iron espagnolette bolts, 6ft. long.

In one list a 6ft. 6in. bolt is priced at 3s. per foot; say, for this, 2s. 6d,

	£	s.	d.
Cost of bolt, say	0	15	6
Labour fixing at ·006 per inch	0	3	0
Screws	0	1	0
	0	19	6

No. 2. Burnished brass ditto, with 1in. rods.

This is worth 3s. 6d. to 4s. per foot.

	£	s.	d.
Cost of bolt	1	6	0
Fixing	0	4	0
Screws	0	1	6
	1	11	6

In our list the price is 4s. 9d. per foot run.

No. 2. Iron monkey-tail bolts, with ¾in. square rod, 3ft. long, and fixing.

Price this at 5s. 6d., and fixing at 1s. 3d.

Two ditto, 18in. long, ditto.

Say, 2s. 9d., and 1s. for fixing.

No. 1. Jas. Hill and Co.'s brass bolt, with indicator No. 2010 R in list.

This is priced at 6s. 6d.

No. 4. 7in. rim locks and brass furniture.

	£	s.	d.
Cost of 7in. lock, say	0	2	6
Fixing	0	0	9
	0	3	3

No. 6. 6in. reversible rim locks, with brass wards, and two iron bolts.

These are quoted in James Hill and Co.'s list at 27s. per dozen, including screws.

	£	s.	d.
Half-dozen	0	13	6
Fixing at ·095 each	0	4	9
	0	18	3
Profit 10 per cent.	0	1	9
Price half-dozen	1	0	0

No. 2. 6in. japanned-iron rim lock, brass wards and bolts, &c.

Price this at 3s. 6d. to 4s. each; screws are included in price, and add fixing 9d.

No. 2. Night-latches, with three keys each.

Cost of a four-lever latch is about 7s. to 8s. each. Hill and Co. sell a very good reversible night-latch, 4in., for 8s. each, with four levers, brass bolt, and two keys. No. 130R in their catalogue.

No. 4. Rim night-latches, brass bolts, four levers, with stop catch and two keys.

These may be priced at 5s. 6d. each. Add 9d. for fixing.

No. 1. A 4in. Bramah night-latch, brass bolt, and stop catch, &c.

These latches are quoted at from 8s. 6d. upwards. Add for fixing.

No. 1. Hill's 4in. mortise night-latch, two levers, brass spring bolt, and keys.

No. 119R is priced at 9s. 6d. A four-lever latch costs 13s. 9d., and fixing, say, 2s.

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WORKMEN'S HOMES.

THERE need not be a doubt as to the paramountcy of the question of house-room over all other domestic questions: it transcends even the question of votes for a few thousand of outlanders in the Transvaal, because here, where the vote is possessed, we are forced to witness, owing to the lack of house-room, the spectacle of stalwart workmen in full work knocking at workhouse doors, and asking for a lodging for themselves and their families; and even where there is the semblance of a home, we constantly come across crowding to the terrible extent of six, eight, ten, and even seventeen people living in an ordinary room. And this is not alone confined to London: it is the same in all our large towns and great mining villages, as I have myself witnessed in Leeds, Newcastle, Glasgow, Edinburgh, Cardiff, Neath, Swansea, &c. The other day I went into a small cottage in a rural part of Wales and found four full-sized beds that were in nightly occupation in a room about 12ft. by 14ft. Cases like these might be multiplied all over the country.

So terrible is the crowding in London and the surrounding districts, that the demand for house-room is unparalleled. But the crowding in London and other large and small towns, and even in the country, is not alone accountable for this hunger for house-room. The genius of the people is awakening from its age-long sleep, and is becoming dimly conscious that there is still room upon the earth, and it at length realises that the destiny of the people is not fulfilled by being born to a crowded, sickly, sweated life, as is the case with millions of the poor of Britain.

This awakening is manifested in various ways, one of which is shown by the downright antipathy which the workers have to barrack-like dwellings, and whether this dislike militates against housing schemes that will pay a reasonable percentage upon the outlay or not, we should, at least, respect an objection which the people have to being crowded to the extent of from 500, as at Millbank, to 2,000 or more upon an acre, as in some parts of Whitechapel and the

Borough. The people think, rightly or wrongly, that to be crowded after this fashion is not a fitting human destiny.

The workmen's housing council, a fairly representative body, while it prefers cottages, concedes the difficulty of providing cottages, owing to the monopoly in, and consequent high price of, land, and it acknowledges that alongside with the municipal provision of cottages and gardens there might be some arrangement of flats and associated dwellings in the more central districts. At the same time, while this is acknowledged, it is acutely felt by the thoughtful among the workmen themselves, and especially among those who, perforce, have to live in the blocks hitherto provided because no other place is available, that the cramped space allotted is most injurious, as proved by vital and educational statistics, not only to their bodily health, but also to their minds, and tends to narrow their outlook and conception of life and duty.

In view of these sentiments and declarations, and the demand for house-room all over the country, and especially in the mining districts and such districts of London and Greater London as Edmonton, Waltham, Finchley, Tottenham, Stratford, Barking, Plumstead, Wandsworth, Lambeth, and many other districts in and around London, we propose to publish a few plans and descriptions of cottages, &c., which will help to show what a worker's home should be like, and how it should be planned, and at what cost, in various materials, in different parts of the country, it might be built.

MINERS' OR COLLIERS' HOMES.

The pair of cottages (No. 1) illustrated herewith are intended for execution in stone, and are adapted for parts of Scotland, North and Middle England, the West Country, Somerset, Devon, and Cornwall, parts of Kent and Surrey, Wales, and some parts of Ireland, and wherever stone is the chief building material.

When stone is used, the outer walls should be at least 18in. thick, whereas 13½in. would do in brick. The dressings, such as copings, eaves courses, plinths, windows, and doorways, should be of some good weathering stone, such as Doulting, Portland, Box Ground, Ancaster, York, Craigleith, &c., while the general mass of the walls might be of rubble stone from the Lias, Pennant, Red Sandstone, or Granitic formations. All should be set in good—hydraulic, if possible—mortar, and pointed in cement.

In a stone building the use of brick as dressings is altogether uncraftsmanlike. Stone may be used for dressings to brick, but not brick for stone. This dictum may militate somewhat against the fetish of cheapness, although where a good workable stone is found close at hand, its use should come well within reasonable cost.

All the principal windows, it will be noticed on reference to the elevation, are of stone, and are intended to be fitted with iron casements where they are required to open, and portions of the windows are intended to be fitted with hoppers and lead glazing.

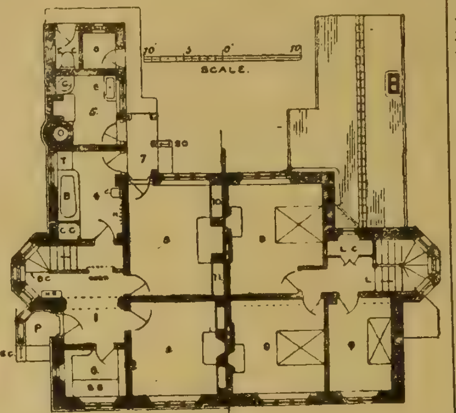
The roof covering shown is of stone slabs, such as were used hundreds of years ago in Wales, Somerset, and other parts of the country, and some of which old stone coverings are still extant. But this kind of covering is not used now for new jobs, excepting for the repair of old houses, and for the special work of one or two architects. But there is no reason why it should not be used for roofs with a good pitch, and work out at as economical a price as slate or tile, and be certainly more lasting than slate, equal to tile, and more artistic than either. Of course, slate or tile could be used for this roof, but they should be the thickest obtainable. The timber generally should be of yellow deal for the framing, and pitch-pine for the joiner's work, oak being used for the sills and exposed parts, as the porch, &c.

THE PLANS.

The plan is the chief consideration. An attempt has been made to find a place for everything, so that there may be no excuse for not having everything and all work in their places.

The Bathroom.—No collier's house should be built without a bathroom, properly fitted up, until, at least, the time arrives when every coal-pit owner is compelled to provide baths and lockers at the pit-head. It will be noticed that the bathroom can be entered from without. The object is this. When the collier returns from his work he is as black as a sweep, and hanging about his clothes is a good deal of the unavoidable black dust and general grime of the coal-pit. When in this state he makes, in the first place, for the bath. Passing the tool-house, he there deposits his mandrel, or shovel, or lamp, and arriving at the back porch (7), he scrapes his boots at S C, and at once enters the bathroom.

Hot Water.—The kitchen range is to be provided with a high-pressure boiler and safety-valve, from which 1¼in. flow and return pipes are carried to the cylinder placed in the top of the cupboard C C in the bathroom. The cylinder, in turn, is connected with the storage cistern in the cockloft (see small upper windows in elevation), and which is in its turn connected with the public supply, if any, or with the force-pump over a well. The help and great convenience of such a bathroom, and the automatical warming of the water while the housewife is merrily preparing the evening meal is patent to all. It will be seen, too, that the bather can reach his bedroom without going through the kitchen, and without exposure, as the doorway from the bath to the staircase is screened from the entrance lobby by a curtain (see "curt." on plan). This arrangement will expedite matters should there be more than one to take a bath. When all is ready, ten minutes should be sufficient to be in the bathroom.



The following is a general reference to the numerals and letters on the plan, and the description of each room or part will be sufficiently explanatory :—

1.	Entrance lobby.
2.	Sitting-room, 11ft. by 12ft.
3.	Living-room and kitchen, 10ft. 9in. by 14ft.
4.	Bathroom, 11ft. by 7ft. 6in.
5.	Scullery, 9ft. by 6ft. 6in.
6.	Tools, wood and coals.
7.	Back porch (through which the collier, as he returns from his work, will enter the bathroom).
8.	Store-room, 7ft. 6in. by 6ft. (provides room for a sack of potatoes, a barrel of flour, and a goodly store of provender).
9.	Bedrooms (3). (Note that the plan is in two halves, the ground plan to the left, and the chamber plan to the right.)
10.	China cupboard (the wife's).
11.	Book cupboard (for the husband and the wife).
B.	The bath.
B.C.	Boot cupboard.
C.	Copper.
C^{1}.	Chair in bathroom.
C.C.	Clothes cupboard. (The cylinder at the top of this cupboard will make it a capital "airing" cupboard.)
E.C.	Earth or water-closet.
H.	Clothes hooks in the bathroom.
H.S.	Hat-stand.
L.	Landing.
L.C.	Linen closet.
O.	Oven of Bridgewater ware. (Every housewife should bake her own bread.)
P.	Front porch.
S.	Sink.
S.C.	Scrapers.
S.S.	Salting stone.
T.	Table in bathroom.
Curt.	Curtain screening staircase from entrance-lobby and bathroom entrance.

It may be noted that there is the semblance of a fruit-tree growing on the front. As I was finishing the elevation a gardener friend came in with some criticisms, which I need not repeat; but he gave some sound advice. Here it is: "Be sure you get hooks and staples built into the walls to which one may train the vine and wall-trees." To which I will add, Let the hooks, &c., be galvanised or dipped in Dr. Angus Smith's solution before being built in.

The cost of these cottages will depend much upon the locality. In some parts of Wales they might be built for £330 a pair. In other parts of the kingdom the cost would range from £350 to £450 the pair.

NO. II.—A PAIR OF WORKERS' HOMES.

These two cottages are contained in a rectangle 46ft. by 23ft. 3in., and the economical aim of the planning has been to bring everything within the four walls. One half of the plan shows the ground floor and the other half the chamber floor. Let us begin with the ground floor.

Entrance, &c.—The front door is set in a little recess, 2ft. deep, which forms a little porch. The passage is 3ft. 6in. wide, and has abutting on it a lavatory and a water-closet. The closet is well shielded, and has two windows for perfect ventilation. It should be borne in mind that the water-closet should only be placed here where there is the possibility of good drainage to a public sewer or to a properly-constructed cesspool and an efficient water supply. No w.c. should be constructed within the house where there is no water-supply. An earth-closet might be constructed here with a small door in the outer wall below the seat for the periodic removal of the pail; but additional room would be required to keep a store of dry sifted earth. The earth system is undoubtedly the best, and is advocated wherever practicable. Particulars for applying the various sanitary systems will be given later on.

Hat Pegs and Umbrella Stand.—Just beyond the lavatory is a space 2ft. 6in. by 1ft. 9in. for hats, cloaks, &c. I make no apology for providing this little space, and the lavatory in a workman's home; on the contrary, I demand an apology from any who say I have herein wasted space. Think of the children coming home from school. There is the lavatory for the hands, and there the place for the "things"—hats, bonnets, satchels, &c.—a place for everything, and everything in its place, even for the boots, as under part of the staircase there is a boot and brush cupboard.

The Staircase.—This is made fairly wide, 3ft., so that an article of furniture might be taken upstairs without breaking the plastering, and a coffin brought down without taking out a window. The staircase windows light both it and the passage.

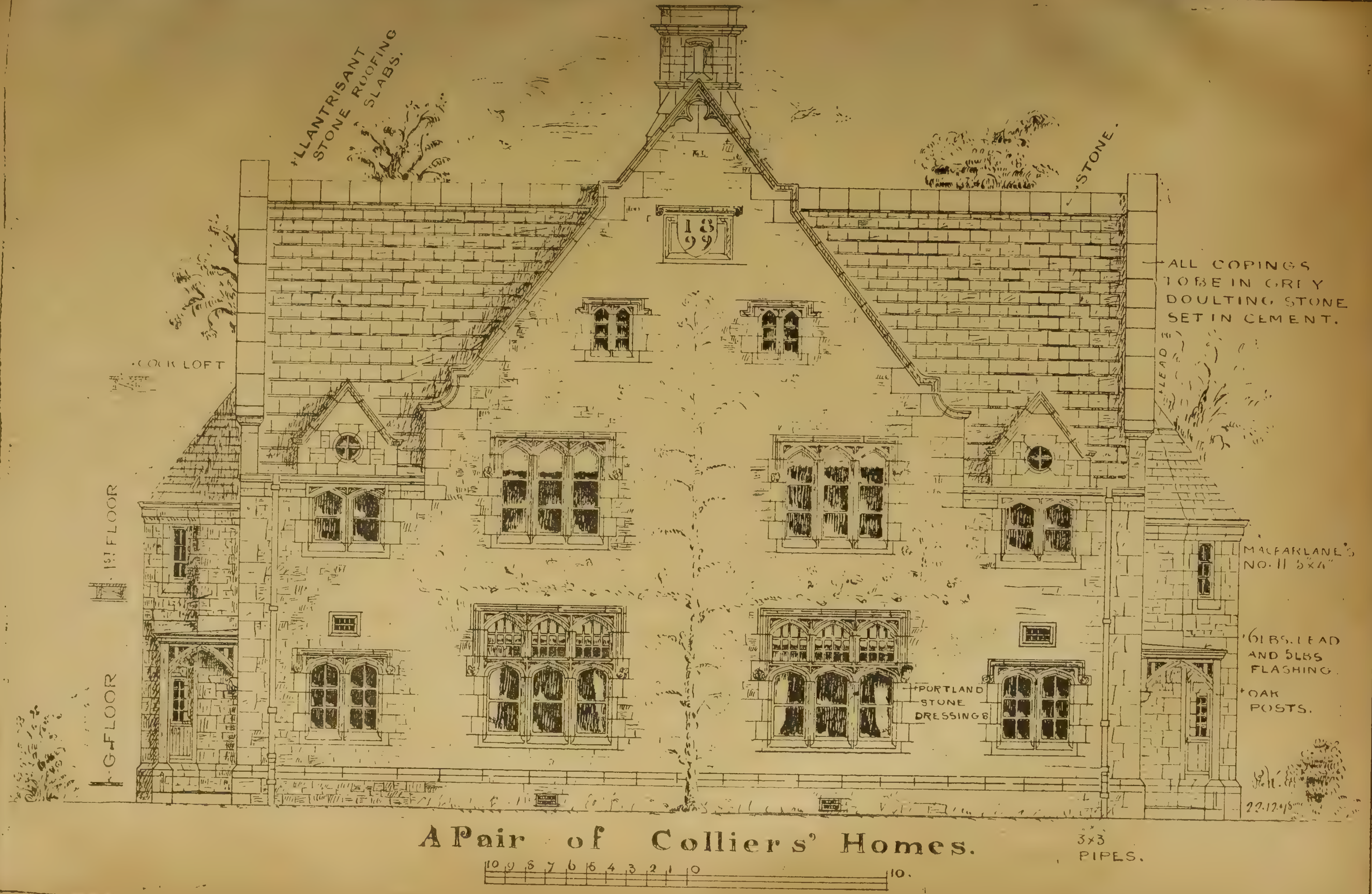
The Store.—Opposite the kitchen door, handy for the housewife and away from any fireplace, is the food store. The size is 5ft. by 3ft. 3in., giving room for a fair average of storage.

Kitchen.—12ft. 6in. by 10ft. 6in. with the fireplace set anglewise. This position for the fireplace in a small room is economical, gives more wall-space, takes less brickwork, and by this means the eight main flues of the two cottages are clustered together into one chimney. The kitchen is fitted with a dresser having cupboards in the lower part.

Scullery.—The scullery, entered from the kitchen and from without, is fitted with a portable boiler and an earthenware wash-tub. There is a sink for washing-up and a coal place, with a shuttered opening for the delivery of coal from the outside. There are shelves for saucepans, &c.

The Parlour.—This room is of the same size as the kitchen, with which it has a door of communication as well as with the passage. The communication between the two rooms is a useful arrangement, and the housewife will appreciate its convenience for serving the tea in the parlour on Sunday, and it will be convenient for the retreat of the housemates when the housewife is busy tossing the pancakes or concocting other delectables. Beside, this door will be found handy on occasions of parties to throw the two rooms, as it were, into one, and for the mother's resting in the parlour in the afternoon while still having an eye on the kitchen. A small corner cupboard is provided in the parlour.

The Chamber Floor.—This contains two bedrooms, each 12ft. 6in. by 10ft. 6in., with angular fireplaces, and a third bedroom, averaging 9ft. by 9ft. There is also on the landing a good sized linen-press and space for a clothes-chest. There is no bathroom in this house; but it would not be difficult to arrange space for a bath by reducing the sizes of the two back bedrooms a little. A useful addition, not shown on the plan, would be the provision of a slop-sink, with taps for hot and cold water, wherefrom water could be drawn for use in portable baths in the bedrooms, and at the sink the baths could be emptied with the minimum of labour. The cisterns can be placed in the roof, access to which would be gained by a trap-door above the landing and a



A Pair of Colliers' Homes.

light step-ladder. The roof should be boarded, felted, and covered with thick Broseley tiles. If this plan were adopted within the London area, the party-wall would have to run through the roof.

Cost.—These plans would answer the requirements of the demand at Edmonton and similar districts, where some time ago, in a lecture, I stated that such cottages might be built for £400 a pair, provided a goodly number were taken in hand; but in small numbers, with the judicious buying of materials and expeditious labour, they ought not to cost more than from £450 to £500 per pair, even in London; and even then would yield a fair return, after allowing from £150 to £700 as the capital cost of land per acre, when let at from 5s. 6d. to 7s. or 8s. per cottage per week. But more of cost anon. These cottages, with a little stable or outhouse in the rear, might be erected in fulfilment of the terms of Part III. of the Housing of the Working Classes Act, which suggests that a cottage might have half-acre gardens attached thereto. It is nine years since this suggestion was solemnly entombed in an Act of Parliament, and there it has lain, bound hand and foot; but now, with a loud voice the people cry "Come forth!"

Robert Williams.

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HINGED BRACED ARCHES.

THE value of some means of allowing for the movement of rigid and braced iron structures, due to alternations in temperature, is admitted, and the most useful mode by which this has been effected is by having hinged joints at the crown and springing. One of the questions that have arisen and have been considered by engineers is the relative economy as regards weight of metal of two-hinged and three-hinged spandrel-braced parabolic arches. Mr. C. W. Hudson, Assoc. M.Am.Soc.C.E., in a paper read before the Annual Convention, discusses this question. The author considers the case of a three-hinged spandrel-braced parabolic arch. He first calculated the stresses, sections, and weight of an arch of this kind, and afterwards made corresponding calculations for an arch of the same outline having two hinges in order to determine their exact relative economy as to weight. The arches were designed for a live load of 2,100lb. per lineal foot, or 36,000lb. per panel of the arch, and a dead-load of 2,880lb. per lineal foot, or 48,000lb. per panel. It is stated no metal less than $\frac{5}{16}$in. in thickness was used for either, and only two sizes of channels, 12in. and 15in., were used for the members other than the arch ring. The unit stresses used in proportioning the members were for tension: Live load stresses, 11,000lb. per square inch; dead load stresses, 22,000lb. per square inch.

For compression in arch ring and top chord: Live load stresses 12,000 − 55 $\frac{l}{r}$lb. per sq.in.; dead load, 24,000 − 110 $\frac{t}{r}$lb. per sq.in. In web members: Live load stresses 11,000 − 50 $\frac{l}{r}$lb. per sq.in.; dead load, 22,000 − 100 $\frac{l}{r}$lb. per sq.in.

Tables are given of both cases. No. 1 for a three-hinged arch having a span length of 200ft. from centres of end piers, and giving the stresses, sections, and weights; and No. 2, those for a two-hinged arch having a span of the same length from centres. The total weight in the first case is 115,000lb., and in the second 109,000lb.

In the preliminary temperature stresses, a range of temperature of 120° Fahr., or a variation of 60° from the mean was assumed. The author says: "The change in length of the arch due to a variation of 60° Fahr., taking the coefficient of expansion as 0·0000065 per degree Fahr., is 0·078ft. Dividing this change of length due to temperature by the change in length due to a thrust of 1lb. we get $\frac{78 \times a \times 10{,}000{,}000}{1{,}000 \times 2{,}308}$lb. as the value of the temperature thrust. The value of a in this expression for the value of the temperature thrust is at present unknown." The preliminary temperature thrust is given as 10,000lb. From these preliminary dead-load, live-load, and temperature stresses the preliminary sections were determined. "In most of the members there is no change, and the greatest change amounts to only 6 per cent., and as the preliminary determination for this case was on the safe side, the final calculation is hardly necessary." The results for weight given above—namely, 115,000lb. for case 1, and 109,000lb. for case 2—"gives a saving in weight of $5\frac{1}{2}$ per cent. in favour of the two-hinged arch. A variation of 75° in temperature would have lessened the difference considerably, but the two-hinged arch would still have been lighter." From these experiments the author thinks that where an arch of this form (spandrel-braced) is suitable, the two-hinged arch is lighter than the three-hinged. It is cheaper to construct, as there is no centre pin, and there are no adjustable members at the centre of the arch. The floor system of the two-hinged arch would be more simple than that of the three-hinged arch, for the great range of height of the centre-pin of the latter, due to temperature and live-load stresses, makes a troublesome break in the floor system at this point. We refer the reader to the paper itself for the mathematical analysis and the tables of stresses and weights.

The comparison made by the author is a useful contribution to the subject. His conclusions show the advantages to be obtained by the use of spandrel-braced two-hinged arches over those that are three-hinged. It can be better used in a series of spans supported by masonry piers, as the two-hinged arch has less horizontal thrust, and therefore smaller piers are required than for the three-hinged; but care is necessary that these piers are well built, and be subject to no displacement. The cost, also, for a series of the two-hinged arches will be less than for the three-hinged. The investigation of Mr. Hudson is of service in proving that the most economical form of hinged arch is also the simplest in construction, both as to the arch itself as well as to the floor system. Whether the same economical results will be found to hold good for structures of greater span is a question that may be worth inquiry.

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THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XIV.

HAVING calculated and tabulated the stresses upon each separate member of the independent central girder in Fig. 1, due to the action of the dead load, those arising from additional weight of the live or rolling load have now to be considered and computed. So far as those to which the flanges are exposed are concerned, their determination presents no difficulty whatever, from the fact that the maximum stresses upon both the upper and lower flanges occur when the rolling load extends over the whole span, that is, covers the entire bridge. There is obviously, therefore, no use in ascertaining the values of the relative stresses produced on the flanges by the successive positions assumed by the rolling load in traversing the truss, since in any position the sum of them will be less than the maximum stresses, arising from the load covering the whole structure. This is exactly the opposite to what takes place in the stresses induced upon the web, each member of which undergoes a maximum tensile, and a maximum compressive stress upon it, depending in each particular instance upon a certain position of the rolling load, which very much complicates their calculation. Taking the flanges first, the dead or uniformly distributed load weight at each of the lower apices was made equal to 5 tons. For the rolling load, it may be put at double this amount, and equal to 10 tons. Referring to Fig. 1, it is evident that when the rolling load extends over the whole span, there is an additional weight of 10 tens at each of the lower apices, amounting in all to a load of 15 tons at each of those points. Since the separate stresses are proportional to the loads, then the total stresses upon each member of the flanges will be equal to three times those found for the uniformly distributed dead load of 5 tons at each apex. It is therefore a very simple matter to multiply the stresses already ascertained in Article XII., for the flanges under the action of a dead load, and collect and tabulate them as in Table I.

Table I.—Parts of Upper Flange.

BO	DO	aO	D_1O	B_1O
+	+	+	+	+
45	75	90	75	45

There is still one more source of stress upon the members of the truss for which no provision has been yet made. It is that of the pressure of the wind, which in the case of a girder of the comparatively small span in Fig. 1 can be adequately resisted by the introduction of proper and efficient wind-bracing without the necessity of calculating its effect theoretically. As a matter of fact, in the present incomplete and uncertain state of the knowledge of the actual wind pressures on roofs, bridges, and other structures, it is not possible to do more than make a rough approximation to the possible results. In large bridges, several hundred feet in span, the wind pressures have to be calculated by rules which are based upon the actual area of the surfaces of the different members of a truss exposed to the action of the wind multiplied by certain constants. In these superficial dimensions the area of the upper and lower flanges and that of the vertical and diagonal members of the web are included. The Board of Trade lays down in its rules and regulations that for all bridges in exposed situations an allowance of 56lb. per square foot shall be made, and this amount of pressure is to be regarded as acting over twice the area exposed by the girder, and is to be resisted by the dead weight of the entire structure. It is clear in any case that, unless an allowance of so many pounds weight per foot run be assumed, as it sometimes is, although it is a loose method, no calculation or estimate of the wind pressure can be made until the elevation of truss has been got out. Our readers will gather an excellent idea of the great importance of the question of the pressure of the wind in connection with the design of girders of large span from the following particulars relating to the Forth Bridge. The stresses brought by the total dead and live loads upon the bridge amounted to 3,258 tons, while those due, or at any rate calculated to be due, to the force of the wind alone reached 2,920 tons, or within one-tenth of the combined effect of the other two.

Table II.—Parts of Lower Flange.

AP	CP	EP	bP	E_1P	C_1P	A_1P
—	—	—	—	—	—	—
45	75	90	90	90	75	45

The reason that the maximum stresses induced upon the upper and lower flanges by the rolling load occur when it covers the whole span is owing to the fact that there are no reversals upon either of them, as there is in the case of members of the web. In each flange the stresses are all of one character, compressive or plus on the upper, and tensile or minus on the lower, as shown by the thick and thin lines in Fig. 1 respectively. Consequently, a simple summation gives the total stresses on the flanges, and the necessity never arises for computing them by taking the algebraical sum of the stresses of opposite character, and also of different amounts. It should be pointed out here, that the statement made regarding the absence of reversals on the flanges of trusses and girders does not hold for all types of them in the manner it does for a truss supported at both ends. Reversals invariably take place in the flanges of continuous and cantilever bridges under the action of a moving load, as will be apparent when we proceed to analyse the stresses upon the anchor span of our cantilever bridge. It is this liability to reversals upon the flanges of girders under certain conditions which engineers and the designers of bridges do not view with a particularly favourable eye, that has led in a great measure to the discontinuance of the continuous principle among ourselves. Our Continental neighbours, on the other hand, favour its adoption, and employ it whenever they can. It is for this reason that with us in bridges of several spans the separate trusses are not united, or bolted, or riveted up together over the intermediate supports. They simply rest upon the piers upon rollers, rockers, or sliding plates, the lower bed-plates being necessarily bolted down or otherwise securely fastened to the infra-structure. The objection to the continuous principle, which is unquestionably a valid one, is that the points of inflexion or of contrary flexure do not remain constant for different positions of the moving load, but undergo a considerable amount of disturbance on one side and the other from their point of normal location.

Referring to Table I., the stress upon the central members of both the upper and lower flanges of the truss is 90 tons, and since the stresses upon the other parts of them have also been determined, we may proceed to the practical form and dimensions to be given to the flanges. Up to a very recent date it was a common

FIG. 1.

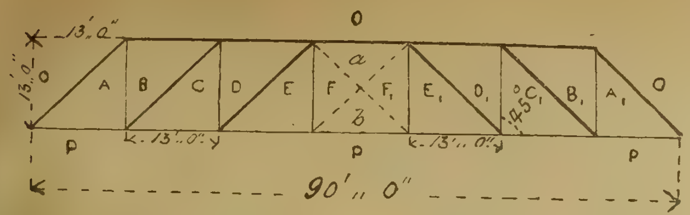


FIG. 5.

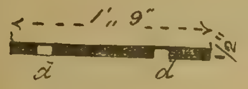


FIG. 2

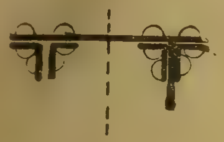


FIG. 3.

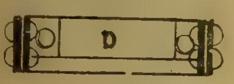
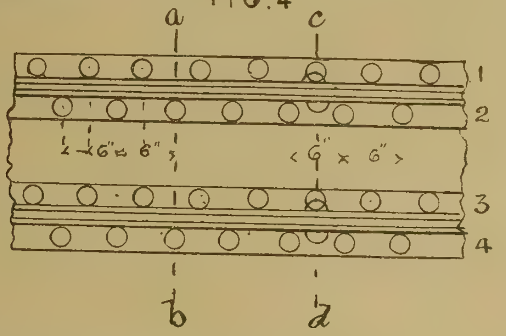


FIG. 4



practice to construct both flanges of precisely the same cross section—that is, of exactly the same form, and each containing the same quantity of material. This old stereotyped form of flange design will not be followed in the present instance, although it answers well enough for small bridges of 40ft. and 50ft. span. It must at the same time be admitted that it would be not so easy a matter to make them otherwise than similar, at least in form, in girders of the plate type. The form adopted for the upper flange of the central independent girder in Fig. 1 will be that of the trough type shown in Fig. 2, consisting of horizontal flange-plates and angle steels for uniting the web and flanges together. Vertical plates, when necessary, are riveted in between the angle-steels; but whether they are required or not will depend upon the amount of material calculated for the cross section, as will be presently ascertained. In Fig. 2 both descriptions of cross section are represented, one half with vertical plates and the other without them. Since the upper flange of the truss is subjected only to stresses of compression, the trough form, by reason of its inherent stiffness, is exceedingly well adapted for it, and it should be observed that the trough portion is turned downwards, which is an additional reason for employing it. Apart from other considerations, it is urged as an objection against its use as a section for the bottom flange, that, in that case, the trough part is turned upwards, and the whole flange becomes a receptacle for every description of dust, dirt, and water that comes into it. It is futile to drill holes in the horizontal flange-plates to allow the small *débris* and dirty water to escape, as they speedily become choked up, and the corrosion and deterioration of the metal proceeds unchecked with much greater rapidity than is commonly supposed.

Discarding, therefore, the trough shape for the lower flange, the form shown in Fig. 3 may be adopted with advantage. It consists of two or more vertical side plates, separated by a distance equal to about the outside width of the upper flange, but connected by diaphragms D at the apices where the vertical and diagonal members of the web meet, as shown in Fig. 1. The struts and ties of the web pass between the angle steels of the upper flange and between the vertical side plates of the lower flange, as will be more fully shown hereafter by other drawings. With respect to these two types of flanges, there is one point to be attended to. That shown in Fig. 3 is not altogether suitable for the flanges of girders and trusses which, as already pointed out, may be subject to reversals, and therefore require a stiffer form.

The total load upon the truss in Fig. 1, of both dead and live loads, has been taken equal to 90 tons, but in order to make some adequate allowance for wind ties, and underneath and overhead extra bracing, it will be as well to put it at 100 tons, or what will be found to amount to the same thing, to take the stresses as tabulated, and use a lower unit stress to the square inch of metal. Dividing the stress upon the central member of the flanges by 6, it will be seen that we shall want in round figures 15sq.in. of net sectional area at those parts, that is in the cross section of either flange at the centre. First let a gross sectional area be determined as follows. Make the width of the upper flange equal to 1ft. 9in., which will also equal the width of the horizontal flange plate, putting the thickness at ½in., which will measure therefore 21in. by 1½in. = 10·5sq.in. As the angle steels cannot be made less than 3in. by 3½in. by ⅜in., and it is possible that these dimensions may not be enough to afford sufficient rivet area for the struts and ties at their junction with the flanges, we have for the area of the angle steels, 4 by 3in. by 3½in. by ⅜in., which is equal to

$$\times\ 6 \times 0\ 375 = 9\text{sq.in.},$$

which makes the total gross area of the flange equal to 19·5sq.in. In order to find out whether this gross area will furnish the calculated net area, it will be necessary to ascertain how the riveting of the upper flange and web is arranged. This arrangement is shown in Fig. 4, in which the rivets have a diameter of 0·75in. and an alternate pitch of 6in. If a section be taken anywhere across the flange along the line *a b*, cutting two rivets, it is evident that the gross sectional area of the plate will be diminished by the holes made for the rivets. Fig. 4 represents a plan of a small length of the lower side or inside of the upper flange to the left of the centre line in Fig. 2. Let A equal the gross sectional area of the flange-plate, and A_1 its net sectional area. Then as before—

$$A = 21 \times 0{\cdot}5 = 10{\cdot}5\text{sq.in.} \;\ldots\ldots\; (1)$$

But this area along the line *a b* is reduced by the amount of metal cut out in the cross section or breadth of the plate, by the rivet-holes intersected by the same line. Now the amount of metal in square inches cut out of the plate by each rivet in the line of section A B, as shown in Fig. 5, is equal to the diameter of the rivet multiplied by the thickness of the plate. Although only two rivets are shown cut by the line *a b* in Fig. 4, yet three must be allowed for to provide for the attachment of stiffening pieces, bracing of struts and ties, and other practical contingencies, which cannot be ascertained by previous theoretical calculations. Putting n for the number of rivets intersected by any line *a b*, d for their diameter, and t for the thickness of the flange-plate, we have—

$$A_1 = A - (n \times d \times 0{\cdot}5) \;\ldots\ldots\ldots\; (2)$$

from which—

$$A_1 = A - (3 \times 0{\cdot}75 \times 0{\cdot}5) \;\ldots\ldots\; (3)$$

and finally—

$$A_1 = (10{\cdot}5 - 1{\cdot}125) = 9{\cdot}375\text{sq.in.} \;\ldots\ldots\; (4)$$

from which it follows that the flange-plate is only worth 9⅜sq.in., instead of 10½sq.in. for the purposes of calculation.

It remains now to ascertain what the gross sectional area of the angle steels loses in metal by the rivet-holes punched or drilled in them. Referring to Fig. 4, it will be seen that but one rivet is inserted in the horizontal rib or side of either pair of angle steels; but Fig. 2 indicates that one rivet hole is cut out of each of the four angle steels in order to admit of the attachment of the members of the web to the upper flange. But as it is certain that some of the rivets in the vertical ribs of the angle-steels will be in the same cross-section of the flange as those in the horizontal ribs or sides, the number to be deducted from the gross area of the four angle-steels is shown in the cross-section in Fig. 4 along the line *c d*. Numbering the angle-steels in the figure 1, 2, 3, and 4, we shall have, since the rivets in the horizontal ribs break joint, two rivet holes in No. 1, in No. 2 one hole, two holes in No. 3, and one in No. 4, or six altogether in the four angle-steels. As it is very possible that an additional rivet might be inserted in angle steels 2 and 4 in the vertical side in the line *c d*, it will be prudent to deduct eight rivet holes from the gross section of the four angle-steels. This is equivalent to assuming that the eight rivet-holes in the four angle-steels in Fig. 2 are in one and the same line of cross-section of the flange. Consequently, if G be the gross sectional area of the four angle-steels, and N the net sectional area we obtain from (2) and (3) in which $n = 8$, $d = 0{\cdot}75$, and $t = 0{\cdot}375$,

$$N = G - (8 \times 0{\cdot}75 \times 0{\cdot}375) = 6{\cdot}75\text{sq.in.} \ldots\; (5)$$

Summing up, therefore, we have the total net sectional area of the upper flange equal to—

$$9{\cdot}375 + 6{\cdot}75 = 16{\cdot}125\text{sq.in.} \;\ldots\ldots\ldots\; (6)$$

or a very little more than the actual amount computed. As it is usual to make the angle-steels of the same thickness as the horizontal flange-plate, they will be made ½in. in thickness, at any rate, for the central part of the truss. which will give in round figures 18sq.in. for the total net sectional area of both the upper and lower flanges, which, from the data already supplied, is equivalent to 22·5—that is, 23sq.in. of gross sectional area. The lower flange, which, in accordance with Fig. 3, will consist solely of vertical plates, must have a section equal to that of its fellow. If, therefore, we have it built up of six plates, three on each side, 8in. in depth and ½in. each in thickness, we shall have the gross sectional area equal to—

$$6 \times 8 \times 0{\cdot}5 = 24\text{sq.in.}$$

or practically the same area as that of the upper flange. The designing of the members of the web and other practical details must be reserved for our next article.

T. C.

HEXHAM ABBEY.

IN the course of excavations at Hexham Abbey Church, rendered necessary to examine the state of the foundations of the remaining portion of the south wall of the nave, which is to form the wall of the proposed completed nave, it has been found that the builders working at the close of the 14th century in the erection of the nave in the Perpendicular style, which they were never destined to finish, laid their moulded base course on the remaining fragment and foundation of the wall of the nave of the church begun by St. Wilfrith in 674. We have, the rector writes, thus brought to light a piece of walling of a church of the largest class and of very early date, and which confirms in a most remarkable manner the accuracy of the account of it left by Eddius, Wilfrith's chaplain, Richard of Hexham, and William of Malmesbury, who speak of its size and the massiveness of its construction. These foundations show that its nave exceeded 100ft. in length and was built of huge stones of Roman workmanship. The piece of cyclopean masonry now uncovered reminds one of the massive structure of the gateways of some of the camps on the line of the Roman wall. The stones are large and rough, and the character of the dressing is distinctly Roman.

Hexham Abbey is thus the oldest, as it is the finest, church in the county of Northumberland, and the recent increase in the town of Hexham has made the straitened dimensions of the portions of the church now used for service to be felt in no small degree. Extension is now imperative, and the choir being cut off by a solid and very handsome ancient oak rood-screen and loft (the removal of which would have been such an act of vandalism that it could not be entertained), some way out of the difficulty had to be found. The committee called in as professional advisers Messrs. C. C. Hodges and Temple Moore, who have drawn up a scheme which the committee intend to carry out, the main item of which is to build the nave on the ancient foundations and of the character of the intended nave of Perpendicular date. In this way the removal of the rood-screen will be obviated, and some 500 additional sittings will be gained. It is intended to leave the rugged and picturesque old walls just as they are, so long as they are not actually dangerous. Canon Greenwell, in addressing the Durham and Northumberland Archæological Society in Hexham Abbey, drew emphatic attention to the incompleteness of the church, and how it was never intended that the beautiful choir and transepts should be seen as they now are, but that they should be viewed outside of themselves, so to speak; they should be seen from the nave. This view is impossible unless the nave were built. Beyond the plan of St. Wilfrith's Church as indicated by the foundations, the committee hope to bring to light many carved fragments from its superstructure, as well as destroyed monuments and crosses from its cemetery. The woodwork of Hexham Abbey is one of its chief charms. It contains no less than 90 Mediæval panel paintings. All these will be cleaned and brought to light, and will in no way be tampered with. The committee appeal to the British public, and especially to the people of the North of England, for aid in this undertaking.

BRADFORD NEW MARKETS.

WE illustrate in our photo-lithographic pages the accepted design. The authors have covered the site by a fringe of ten shops, fronting James-street, Northgate, and Rawson-square. The hotel occupies the corner of Rawson-square and Northgate. The centre of the site is the market, covered by a roof of slates, glass, and steel. Its arrangements are shown by the plan. The two entrances to the market are at the centre of the Northgate and Rawson-square fronts. Communication is also made with the covered market in James-street, now in the course of erection. There are no steps at these entrances, differences of levels are negotiated by an incline. The entrance to the basement under the covered market is from James-street, and consists of a cart delivery backing up to a hydraulic lift and an easy-graded staircase. This lift will extend to the balcony on the first floor-level for the convenience of the tenants of the shops and hotel. Between the lift and the staircase there is sufficient gangway for the tenants to go to and from their shops and stalls to this lift and staircase. At the rear of the lift is a landing-place, recessed from the shop-front line, for easy delivery of goods on the market floor-level. Entrances are made from the shop sub-basements to the covered market basement. There is also an entrance from the present lavatory yard to the market basement, which will be a convenience for the tenants of the butchers' stalls and a ready access to the boiler-house. At the basement entrance from James-street and the market entrance from Rawson-square two staircases are provided leading to the balcony. These are arranged that they can be always open without interfering with the market entrances. This balcony is at the rear of the shops and at the level of their first floor. All the shops have doors and windows to the streets and to the market. They are self-contained, and have basement, ground, first, second, and attic floors, and some of them have a sub-basement. The first floor can be used either as show-rooms or as house-rooms. The hotel at the corner of Northgate and Rawson-square has 56ft. frontage to Northgate and 30ft. to Rawson-square. The principal entrance is in Northgate. It has entrances also from the covered market, Rawson-square, and the balcony. On the basement there is a commodious restaurant, with serving bar and food lifts to the kitchen on the second floor. This room is entered from the Rawson-square market entrance and from the hotel staircase. The remainder of the basement is occupied by a lavatory and the usual cellarage and stores. The beer and wine cellar is entered at the level of the market basement for supplies. It has also internal communication with the hotel. The ground floor has a spacious saloon, with serving-bar, commercial-room, tap-room, and entrance-hall. The serving-bar commands a full view of the entrances and staircase. The first floor has dining-room, clubroom, serving-room, spirit-store to supply the serving-bar, and a lavatory. The second floor has a kitchen, scullery, and five other rooms, which may be used as stock-rooms, sitting-rooms, and bedrooms. The attic floor will be a repeat of the second floor as far as number of rooms goes; the ceiling following the rake of the spars to some extent. The attic story will have seven rooms. There is a hydraulic or electric lift for passengers or light luggage from the basement to second floor. The staircase is of easy gradient, and will be constructed of stone. The landings and entrance will be of concrete and steel. The floor of the market basement is level. The height varies from 8ft. to 15ft. clear—on account of the market floor following the grade of the surrounding streets. The basement under the market is to be used for storage. In the middle of the central gangway and under the centre of a dome is a circular opening in the market floor (8ft. diameter) for light and ventilation. It is protected to the height of 8ft. by timber framing, which is encircled by market stalls. There is an encircling metal tube, 8ft. high, round each pillar of the covered market, leaving a space of 3in. or 4in. for ventilating the basement. There are a number of circular "deck lights" of glass, in iron frames, round these pillars, so that the cold storage of the basement will have a fair share of light as well as the gangways. The market floor will be carried by pillars and girders, and will be independent of any support from the cold-storage walls. This leaves perfect freedom for the arrangement of the cold-storage blocks, which has therefore only been shown by dotted lines. The central part of the covered market is roofed in by an octagonal dome of cast iron, steel, and glass. It is supported by eight pillars and their connecting arches, from which spring eight circular trusses, converging on a louvred lantern. The spandrels of these trusses and the connecting arches will be filled with wrought-iron ornamental scroll work. The architecture adopted conforms to the style of the design of the present buildings, but it is of a lighter character and more in harmony with the present taste. The three fronts will be faced with cleansed ashlar backed with bricks. All stone facing the covered market below the balcony line will be cleansed ashlar, and above that line common hammered wallstone backed with bricks. The wall of the market from the balcony line to the eaves line on the market roof will be of glazed brickwork on both sides. The walls of the market basement will be all faced with white glazed bricks and the floor of cement granite-faced concrete. The market floor will be of similar concrete, 10in. thick, supported by steel joists and girders and cast-iron pillars. Shop windows will have plate-glass in teak frames; joiners' work of pitch-pine or Canadian yellow pine; Westmoreland slates to all roofs. The architects, Messrs. T. C. Hope and Son, estimate the cost at £20,000, as per the following particulars:—403,365c.ft. shops and hotel from the ground floor line upwards (8¼), £13,860; 133,140c.ft. cellars under the shops and hotel and 83,160c.ft. basement under market, including the thickess of the market floor (3), £2,700; 185,152c.ft. market from ground floor upwards (this includes the octagonal dome 44ft. diameter) (4½), £3,465; total, £20,025.

◆

The foundation-stone of the Borough Technical College, at Sunderland, was laid on Wednesday. The building is English Renaissance in style. The architects are Messrs. Potts, Son, and Hennings, whose design was awarded the first premium and £100 by the assessor, Mr. J. M. Brydon, in the recent competition, and the tender of Mr. John White, of Sunderland, has been accepted for the contract at £18,560.

At the Town Hall, Gravesend, on the 21st inst., Lieut.-Colonel A. C. Smith, R.E., Local Government Board inspector, conducted an inquiry into the application of the town council for sanction to borrow £2,000 for the laying out of Windmill Hill as public walks and pleasure grounds, under the direction of Messrs. H. E. Milner and Son, £240 for the purpose of the municipal offices, £550 for market purposes, and £220 to defray excess expenditure in connection with the fire station and steam-roller house.

PUBLIC HEALTH CONGRESS AT BLACKPOOL.

A CONGRESS of public health was opened on Friday last at Blackpool, and has been continued during the present week. The attendances have been larger than in the previous years, and the papers well discussed.

In his presidential address, the Marquis of Lorne, M.P., touched on the possible value of imagination as an aid to scientific methods in the curing of disease, pointed out the necessity of constant improvement in sanitation to keep pace with the conditions created by increasing population, and urged that good nursing was a necessary supplement to even the best surgical and medical treatment. He urged the members to make a hardy annual of the agitation for less smoke and purer drains, and recommended the maxim "Live in cleanliness and godliness."

In the Preventive Medicine Section, Dr. E. W. Hope delivered an address as to the means which should be adopted for advancing the health of the people. As the only means of gauging the success of such undertakings consisted of statistics, he advocated the taking of a quinquennial census, which would awaken public interest as to sanitary necessities. The medical inspection of children in elementary schools was recommended as a means of preventing the spread of infectious diseases. There was considerable discussion on the advantages of cremation, and a resolution adopted in favour of giving facilities to public bodies to erect crematoria.

THE RIBBLE DOCKS.

On Saturday a large body of the members proceeded to the Ribble estuary and dock, and Mr. T. G. Lumb, C.E., described the dock works, and dealt with the geological formation of the river bed. He said that beds of red and blue marl and gypsum continued for 7½ miles from the dock entrance, where they are lost sight of. It was the removal of this great mass of marl, which stretched as a great dam across the river, that had been the cause of so much trouble and expense. It was almost as hard as rock, and so hard as to tear the steel hips from the buckets of the dredgers. The most powerful machinery was required to dislodge it.

A PROSPEROUS ELECTRICAL TRAMWAY.

The new electric railway and carriage works on the Preston Marsh were also inspected, as well as the adjacent and extensive works being built by a syndicate of English and American gentlemen for electric equipment. Thence the party went by special train to Fleetwood, where they inspected the new electrical railway connecting Fleetwood with Blackpool by a short shore route. Mr. Lumb, C.E., stated in a paper he read that this was one of the best paying tramroads, if not the best, in the world. In the first twelve weeks no less than 550,000 passengers were carried, realising over £12,000. A special feature of the line was the plastic rail bond, which was wholly new in this country. It is composed of two portions—a plastic or putty-like metal compound, which made contact between the rail and the metal of the joint, and a flexible elastic cork case to hold the plastic part in position.

PREVENTABILITY OR OTHERWISE OF CONSUMPTION.

A paper by Dr. Ransome, F.R.S., was read before the medical section, bearing on the influence of sanitary authorities in preventing tubercular disease. In referring to what had been done by sanitarians in the past, he said it was acknowledged that the mortality from phthisis in England and Wales had diminished by one-half in the course of the last 35 years; and, although they could not trust the earlier returns of the Registrar-General, it was extremely probable from the regular nature of the decline of the phthisis rate that it had really gone down to one-third of its prevalence in the year 1838. The greater part of the enormous shrinkage he attributed to the better drainage of the soil, to improved dwelling accommodation, and to a greater power of resistance on the part of the population against infection. The improved conditions of life and much of the increased power of resistance were the result of the sanitary improvements which had been carried out within the present reign. Tuberculosis, he argued, was a strictly preventable disease, and if preventable, why not prevented? He proceeded to describe how the local sanitary authorities could do good service against tuberculosis by promoting various sanitary measures. Under the head of Sanitation they could not omit improvements in the condition of the working population—that was, in their feeding and clothing, and especially in their housing, in their hours of labour, and protection from noxious atmospheres.

Dr. E. K. Cartwright, demonstrator in State medicine, King's College, London, said it was a question whether ordinary sanitation could reduce the prevalence of tubercular disease beyond a certain point. They had yet to find out what it was that determined whether the disease would get a foothold in those who were exposed to it. Myriads of germs passed through the system for every one that succeeded in getting an entrance into the tissues, and until they knew a little more about that aspect of the question, all their precautionary measures were at the best empirical.

SMOKE POLLUTION.

On the question of the pollution of the atmosphere of large towns, the Congress passed a resolution in favour of the Government taking over the prosecution of defaulters, as sanitary inspectors were frequently hampered by having to prosecute their local superiors.

VENTILATION FOR FACTORIES.

Mr. E. L. Hartley read a paper on "Recent Legislation with respect to Factories and Workshops, with Special Reference to the Proportion of Carbon Dioxide in the Air thereof." The regulations of the Cotton Cloth Factories Act, 1889, with regard to the humidity of sheds, had been an immense boon to the cotton trade of Lancashire. In dealing with the question of ventilation, he said it was comparatively a simple matter to forbid employers from introducing more than a certain quantity of moisture into the sheds, but it was a totally different matter to compel them to adopt an adequate system of ventilation. That such legislation was desirable, if it could be made effective, was, in his opinion, beyond doubt. If trade competition could not be trusted to select the best method of ventilation, some responsible and capable court of arbitration would have to be devised to settle the divergent views of masters and inspectors, and to insure more continuity of policy in those matters. There was no doubt that the compulsory ventilation had been beneficial, and that the standard of ventilation could be with advantage considerably raised above the level of the Act of 1889. At the same time, in considering the present state of ventilation, regard should be paid to the immense improvement made during the last ten years.

Dr. Wheatley, Medical Officer of Health for Blackburn, pointed out that Mr. Hartley had omitted a most important point—namely, the supply of pure steam. Some of the water used was, he said, highly polluted with sewage, and however efficient the ventilation might be, the atmosphere under such conditions could not be satisfactory.

MOSES THE SANITARIAN.

A paper by Dr. Adler, of London, Chief Rabbi, was read by Mr. T. Cann Hughes, town clerk of Lancaster, in which the writer referred to the hygienic provisions of the Decalogue. Moses, he pointed out, insisted on personal cleanliness, and in the Books of Leviticus and Numbers entire chapters were devoted to the subject of the cleansing of the person and the clothing. The laws of the Pentateuch enforced the method of prevention of infectious diseases by isolation, a system now regarded as truly wise and philosophic. In some cases the sanitary officer under Moses had to demolish the house and cast its fragments out of the city—a weighty admonition as to the way to deal with the rotten tenements that still disgrace so many towns in this country. Then the land laws of the Bible, which were calculated to keep the Israelites as agriculturists, must at the same time have been intended to perpetuate a sturdy and robust race.

CODIFICATION OF LAWS RELATING TO HEALTH.

Mr. H. Brevitt, Town Clerk of Wolverhampton in a paper on this subject, discussed the Public Health Act of 1875, pointing out its defects, and said that subsequent legislation had rendered the amendment of that Act necessary and desirable. He made out a strong case for the codification of the laws relating to the public health, and submitted the following suggestions:—(*a*) That the principal Act should be accepted at the basis of the proposed legislation. (*b*) That to effect the scheme of codification there should be a total repeal and re-enactment, with necessary modifications and amendments (consequent upon judicial decisions and subsequent legislation), of all the Acts or parts of the Acts now in force included in the appendix. (*c*) That effect should be given in the new statute, if practicable, to the suggestions which have from time to time been made by the Municipal Corporations' Association, numerous sanitary authorities, the Local Government Board, and others in relation to the amendment of the public health laws, and the same statute should contain such provisions of local Acts relating to the same subject as may be desirable in the public interest. (*d*) That the new statute should be so arranged in parts that each part, as far as practicable, should be complete in itself in regard to the subject included therein. (*e*) That powers of local authorities and others under local Acts similar to those contained in the new statute should be preserved. (*f*) That no option should be left with local authorities to adopt or be exempt from the provisions of any part of the new statute, but that, with exceptions and qualifications it should be applicable everywhere. (*g*) That the provisional order system should be extended in the manner indicated. (*h*) That the new statute generally should be applicable alike both to urban and rural districts, except where otherwise specified and determined. (*i*) That provisions of other public Acts intended to be read as or to form part of the new Act should be set out verbatim therein, either in the text or in the schedule, and not be incorporated therewith by mere reference.

Mr. H. Pritchard, of London, who opened the discussion, said that a Bill codifying the law would not be a very difficult matter, and there should be no difficulty in getting it through Parliament. But that would not meet all the necessities of the case. As they knew, there was ample room for amendment, and any Bill which dealt with the matter in a complete way would necessarily have to amend and not simply to codify the existing law. A Bill to both codify and amend would be a very huge task. Something should be done to reduce the expense of legislation.

Mr. Alderman Jackson, of Wolverhampton, referring to the observations of Mr. Pritchard with regard to the expense of legislation, urged that a corporation should have the right to employ its town clerk in cases in which it had to bring a Bill before Parliament. Corporations did not wish to displace the Bar at all; they felt their prestige and they felt the value of an able barrister, but what they desired was that if a town clerk was intimately acquainted with a particular Bill which his corporation desired to press before a Parliamentary committee, they should have the right to employ the town clerk as their advocate. They did not desire to introduce their town clerks as rivals of the Bar, but they wished to utilise their knowledge and experience to that extent.

Mr. Womersley, of Leeds, went further than the previous speaker. He had come to the conclusion, almost, that the time had arrived when there should be a reconstitution of the authority dealing with local matters. He suggested the appointment of municipal commissioners in the same way that there were light railway commissioners. Let them do away with the Parliamentary Bar altogether as far as purely municipal matters were concerned.

Dr. Sanders (West Ham) moved and Mr. T. H. Morris (Acton) seconded the following resolution:—"That it be a recommendation from this meeting to the general meeting of the Congress of the Institute to consider the best means of attaining a satisfactory codification and amendment of public health legislation, and to take practical steps to carry this resolution into effect."

Dr. Cameron, medical officer of health, Leeds, drew attention to the inconvenience of having to go to London to fight municipal cases.

The mayors of St. Ives and Wolverhampton and other speakers joined in the discussion, after which the resolution was put and adopted.

ENGINEERING AND BUILDING CONSTRUCTION.

The Section of Engineering and Building Construction resumed its sittings in the Victoria-street Schoolroom, Mr. Benjamin Sykes presiding.

The first paper read was by Mr. A. H. Tiltman, of London, upon "Public Baths and Wash-houses." Mr. Tiltman confined himself entirely to the changes, generally and in detail, which he considered to be necessary in the distribution, classification, and arrangement of these establishments.

M. W. P. Liernur, of Paris, read a paper upon the "Disposal of Sewage," in which he explained the Liernur system of town sewering by evacuation process, adopted in Trouville and other Continental towns.

THE QUESTION OF ARTISANS' DWELLINGS.

The last paper submitted to the section was one by Mr. J. H. Brierley, borough surveyor of Richmond, Surrey, upon "Artisans' Dwellings." Mr. Brierley gave details of municipal housing schemes which had been already carried out in London, Aberdeen, Birmingham, Glasgow, Manchester, Leicester, and many other towns.

At the closing meeting of the Congress, held on Tuesday, Aberdeen was decided upon as the next place of meeting.

NATURAL AND ARTIFICIAL METHODS OF VENTILATION.*

We have received a copy of a useful little brochure on this subject published by Messrs. Robert Boyle and Son, Ltd., of Holborn Viaduct, Glasgow, Paris, &c., in which the methods of natural and artificial ventilation are discussed. We have lately described these methods, well known to most of our readers, and this useful compilation summarises the comparative values of the two methods, and shows how natural ventilation fulfils the requirements of most buildings. These are illustrated by diagrams, and various opinions are quoted and extracts from official reports of commissions on ventilation appointed by the British, French, and American Governments. These should be carefully read, and their perusal will convince the most prejudiced of the evils of forced down-draught ventilating systems and other disadvantages that attend the mechanical systems. The principle of mechanical down-draught ventilation, by what is known as the "plenum" system, as applied to a hall or church, is well illustrated by the coloured section given in the supplement, which graphically shows how the respired and heated air is rebreathed by the audience in the gallery and body of the hall. Another section illustrates the principle applied to a hospital ward. A study of the evidence given in this little book tends to well show that the latest installations of the "plenum" or forced system at the Birmingham General Hospital, and the Victoria Hospital, Glasgow, have not been so successful in some respects at least, and we may quote the opinions of A. S. E. Ackerman, M.I.C.E., and an article in the *Hospital*, given on pages 49, 50, &c. These reports show that to insure a successful application of the down-draught plenum system, the windows have to be sealed—a condition not favourable to health, especially in a hospital, and the cost of the system is greater than its merits justify. But we leave our readers to study the many official reports of authorities and the experience of scientific experts, which are given in this work.

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Stained glass has been placed in the east window of the old parish church of Bothwell, which was reopened after restoration about a year ago. The subject is the Nativity of Christ. The cartoons were prepared by the late Sir Edward Burne-Jones shortly before his death, and the work has been executed by Messrs. Morris and Co., of London. The distinctive characteristic is the concentration of interest in the Mother and Child. The wise men, the shepherds, and the angels gaze with mingled reverence and adoration on the sight that is revealed to them.

During the last few years a considerable amount of work has been effectively accomplished in connection with the restoration of Clonfert Cathedral under the supervision of Mr. J. F. Fuller, F.S.A., architect, of Dublin. Two stained-glass windows by Messrs. Hardman, of Birmingham, representing St. Peter and St. Paul, have been placed at the east end of the Cathedral. These windows and a memorial brass have been given by Mr. Thomas Roderic O'Connor in commemoration of the Queen's Diamond Jubilee. Mr. O'Connor has also presented the cathedral with a memorial pulpit of carved oak, at a cost of £190. Mr. John Ruskin, although objecting, as a rule, to all "restoration," was so much struck with the beauty of the doorway of Clonfert Cathedral that he has quite recently sent a donation towards its preservation. £2,000 is needed to complete the work of restoration in addition to the £1,500 already expended.

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* Natural and Artificial Methods of Ventilation. London: Robert Boyle and Son, Ltd., Holborn Viaduct, E.C.

BOOKS RECEIVED.

A Manual of Historic Ornament, by RICHARD GLAZIER, A.R.I.B.A., &c. (London: B. T. Batsford).—This is a copious illustrated manual of ornament, treating upon the evolution, tradition, and development of architecture, ornament, and other applied arts. The volume is admirably printed and artistically got up. All the great historic periods—Assyrian, Egyptian, Greek, Roman, Byzantine, Norman and Gothic, the Early English Decorated and Perpendicular phases, Italian, French, and English Renaissance—are described in their main characteristics of ornament and features, and the illustrations are well selected, accurately drawn, and spirited. Briefly the author dwells on each phase of art, traces its development from previous types, and gives typical examples of each period. The names and dates of great architects and artists are given, and the book forms a very useful epitome, arranged in chronological order of architecture and its allied arts. Thus we have brief illustrated descriptions of ivory, mosaics, ceramic art, terracotta, enamels, stained glass, gold and silver, bronze, wrought iron, furniture, textiles, &c., terms used in ornamental art, list of textbooks, &c. The work is a valuable handbook for students of art and craftsmen in the various arts.

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CHIPS.

The foundation-stone of a Bible Christian Chapel was laid near Camelford Station on Saturday. The building contract has been taken by Messrs. Hooper and Dennis, of Camelford.

The new building erected for the Birmingham Police Institute, at the corner of James Watt and Dalton-streets, will be opened on Wednesday, October 25, by the Lord Mayor of Birmingham.

Colonel A. G. Durnford, R.E., inspector of the Local Government Board, held an inquiry at the Town Hall, Newcastle-under-Lyme, on Tuesday, regarding the application of the Corporation to borrow £340 for street improvements. Under the provisional order of the Potteries Electric Traction Company an extension of tramways to Silverdale from Newcastle is authorised. The proposed line passes down Church-street, where, at the bottom, a block of buildings projected, reducing the thoroughfare to 12ft. 6in. wide, and making an awkward curve. Arrangements were made between the company to purchase the buildings for £1,050—the Corporation to contribute £250 (the subject of this inquiry), the company to throw the site of the buildings into the roads, which would then become 26ft. wide.

On Tuesday week the Mayor of Sandwich visited the gasworks for the purpose of formally laying the foundation-stone of the new buildings which are about to be erected—viz., a boiler house a mortuary, and a fitting-room. The buildings are to be carried out from plans by Mr. Charles J. Conquest, the borough surveyor, the contractor being Mr. F. J. Brett.

We have received the educational announcements and the syllabus of classes, with particulars of examinations, concerning three of the great institutions that are striving to benefit the young men of London, and all of which reopened their doors to students on Monday last, the 25th inst. These are the Birkbeck Institute, Bream's-buildings, and the Polytechnic Institutes at St. John-street-road, E.C. (the Northampton), and the Borough-road, .E.

The city council of Coventry decided, on Tuesday, to give the borough engineer, Mr. J. E. Swindlehurst, an honorarium of £300 for special work done as resident engineer on the Lodge Farm sewage disposal scheme, and to advance his salary as from Michaelmas Day from £500 to £750 per annum.

Dean Pigou has arranged for an octave of services to be held next month in Bristol Cathedral to commemorate the restoration of the edifice at a cost of £20,000. The special preachers will include the Archbishop of York (who will dedicate the new reredos on Oct. 19) and four bishops.

The University Court of St. Andrew's, N.B., have voted £1,000 towards the cost of restoring to worship St. Leonard's Church, in that burgh, now a roofless ruin, and which the heritors proposed to rebuild. The church of St. Leonard consisted of a nave 86ft. by 20ft. 7in. internally, a western tower standing on ground about 25ft. 6in. by 15ft. over all, a sacristy about 24ft. by 9ft. 6in. internally, and a south porch. The existing structure measures internally 80ft. by 20ft. 7in. The church had the roof taken off about the year 1763, and has remained in that state ever since. At the same time all the interior woodwork was removed. The tower of the building was demolished in the latter part of last century by Principal Watson.

OBITUARY.

WE record with deep sorrow the death of Mr. CHARLES WILLIAM BRADLEY, the head of the firm of printers who for so many years have produced this journal. Mr. Bradley, who was in his 62nd year, died at Brighton on Sunday, and was buried at Hove Cemetery yesterday amid the regrets of many old friends. Mr. Bradley sprang from an old Huguenot family, and his forbears settled in England during the religious persecutions of the seventeenth century, in company with their compatriots, so many of whom were identified with the silk-weaving industries. His early life was one of struggle and self-sacrifice, but he soon found his footing. He determined to be a printer, and, surmounting many difficulties, succeeded in apprenticing himself to the late Mr. Levy, the well-known proprietor of the *Daily Telegraph*. Shortly after the close of his apprenticeship—by which time he had already married—Mr. Bradley started in business for himself, and, in spite of some obstacles, was in no long time successful. In subsequent years the firm was joined by Mr. West, and the present flourishing business solidly built up and extended. In private life Mr. Bradley enjoyed the friendship of all who knew him. His principal recreation was music, and, had he elected to pursue that art in early life, his natural gifts would undoubtedly have secured him a creditable position among its votaries. One of the keenest and shrewdest men in business, he was a very faithful friend, and never missed an opportunity of assisting the less fortunate.

THE death of Mr. EDWARD CASE, J.P., civil engineer, occurred on Saturday at his residence at Dymchurch, Kent, from heart affection. During the last few years Mr. Case had become widely known in the engineering world, owing to his system of groyning for sea defence. He attended the deliberations of the British Association at Dover last week, and was to have read a paper before that assembly. He was, however, too ill to do so, and his paper was read for him. On Thursday he returned home, and had several severe attacks during Thursday and Friday night. At five o'clock on Saturday evening he was found dead in his room. His father held the office of magistrates' clerk of Maidstone for many years; a brother holds that position at the present time. Mr. Case, who was for many years superintending engineer in the Public Works Department of Ceylon, since his return to England became senior partner in the firm of Case and Gray, consulting engineers, Victoria-street, Westminster, and was appointed expenditor of Romney Marsh Level in May, 1890. The sea wall was then in a very dangerous condition. From 1872 to 1890 the low-water mark had advanced 400ft., although £70,000 had been spent during this period to maintain the wall. Mr. Case recommended a system of groyning, which the authorities were of opinion would be a too heavy burden for the ratepayers. Other works carried out were unavailing, and after £20,000 had been spent in renovating the wall on the old principle, and after other engineers had been called in, the authorities left the matter in the hands of their expenditor. Since then Mr. Case has carried out his system of groyning, and there are now 170 groynes, varying from 350ft. to 1,000ft. in length, extending a total length of ten miles, the effect of which has been to raise the foreshore in some places as much as 8ft., and an average of 4ft. 6in. throughout. The low water-mark has been thrown back beyond the limit in 1872. So successful was Mr. Case that he was called in to advise and carry out his system in many places round the United Kingdom—New Romney, Deal, Folkestone, Lowestoft, Cromer, Sheringham, Eastbourne, Blackpool, also on the Irish coast, and at Ostend. Mr. Case leaves a widow and four children.

A PAINFUL feeling was spread in Burntisland, N.B., on Sunday, when it became known that the burgh surveyor, Mr. DAVID MORTON, had terminated his life by carbolic poisoning. Mr. Morton had recently resigned the office of sanitary inspector of the burgh with the concurrence of the local authority, and the belief that his surveyorship duties would also have to be relinquished preyed upon his mind, and led to a depression of spirits, which caused anxiety to his friends. He took occasion, while his wife and family were preparing on Sunday for church, to drink the contents of a bottle of carbolic acid used as a disinfectant, and a fatal result speedily followed. Mr. Morton was formerly a master builder in the town. He was fifty-seven years of age, and leaves a widow and family.

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The Victoria cottage hospital in the Chobham-road, Woking, was opened last week. It is 92ft. by 97ft., and has a central administrative block three stories in height, with one-story wards each 27ft. by 22ft. on either side, and one single-bed ward, the total accommodation being for 13 patients. Messrs. T. Allen and Son, of Duke-street, Adelphi, were the architects, and Messrs. J. H. Harris and Son, of Woking, the builders.

Miss Thomas, of Llwynymadog, one of the owners of the Pontypridd joint estate, is about to present the inhabitants of Pontypridd and district with Gelliwastad House, together with a large lawn, for the purposes of a non-political club and recreation ground. The premises are situated in Gelliwastad-road, and have been altered and furnished to suit the requirements of a club, from plans by Mr. Arthur O. Evans, of Pontypridd, at a cost of £1,500, Miss Thomas having defrayed all the expenses herself. The opening will take place on Saturday in next week.

The foundation-stone of the new church of St. Michael and All Angels was laid at Woolmer-green, near Welwyn, Herts. Mr. R. Weir Schultz, of London, is the architect of the church, which will consist of a nave and chancel under a single-span roof, a south porch, and eventually a tower at the south-west angle, capped by a dwarf spire. The style is Late Perpendicular, and the treatment plain.

The Hampstead Vestry have unanimously resolved to take steps for the acquisition of Hampstead Green as an open space for the public. Sir Henry Harben, the chairman, on behalf of the lady who bought the whole of the property for £7,500 in order to give the vestry an opportunity of purchasing the green or paddock, has explained that it is intended to obtain such a price for the back property that the green will be given to the public free of charge.

The new Conservative Club, built at Barrow, at a cost of about £8,000, and presented to the party by Sir Charles Cayzer, M.P., was formally opened by the donor on Friday at a meeting held in the Queen's Hall, which forms part of the club premises.

Mr. Hamo Thorneycroft's colossal statue of Oliver Cromwell, which was conspicuous in the Academy Exhibition this year, and which has been erected on a lofty pedestal in the sunk garden on the west side of Westminster Hall, will be unveiled on the 31st prox., when Lord Rosebery will assist at the ceremony.

The Light Railway Commissioners held an inquiry at the Institute, Ormskirk, on Monday, to take evidence respecting the proposed Ormskirk and Southport Light Railway, the scheme being for an electric passenger and agricultural traffic line, which is to be run from a point near the Lancashire and Yorkshire Railway Company's goods yard at Ormskirk, along the Southport-road, viâ Scarisbrick Bridge, to the Southport borough boundary, to which boundary there run to and from London-square, Southport, and Birkdale Common the lines of the Birkdale and Southport Tramways Company, these lines being likely soon to pass into the hands of the Southport Corporation or of an electric tramway company. At the close of the hearing, Lord Jersey, the chairman, announced that the order would be granted.

The Roman Catholic Church of St. Mary, Moorfields, is to be closed after Sunday. The site of the church, schools, and priests' quarters has been secured for commercial purposes for £201,000.

The new workhouse hospital, Sunderland, is being warmed and ventilated by means of Shorland's patent Manchester stoves, some single fronted and some double fronted, with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Prizes and certificates to successful students in the Polytechnic plumbing classes were distributed on Monday evening in the Great Hall, Regent-street, by Mr. Robert Mitchell, Director of Education to the Institute. Mr. H. Stanfield took the City and Guild's first-class certificate and bronze medal and the Institute's silver medal and certificate and a number of miscellaneous prizes; Mr. E. Byles was awarded the City and Guild's certificate, the Institute's certificate and silver medal, and other prizes; Mr. R. H. Bew the City and Guild's certificate, a County Council scholarship, &c.; and Mr. C. H. Mills a County Council scholarship, &c. The Institute's bronze medals were taken by Mr. E. Higgs, Mr. E. Toten, Mr. C. Thomerson, and Mr. F. Smith; and the City and Guild's honours certificates by Mr. F. Smith, Mr. A. Ord, Mr. W. J. Mitchell, Mr. E. Toten, Mr. T. H. Gullett, and Mr. J. Downing. Mr. J. Wright Clarke, the teacher, stated that since the classes were organised in 1882, 1,940 students had passed through them.

Building Intelligence.

Aston.—On a site at the corner of the Frederick and Whitehead-roads, St. James's Church was erected in 1890. Owing to an insufficiency of money the chancel only was built of brick, the nave being constructed of timber and corrugated iron. In March, 1895, a great gale utterly destroyed this portion of the building, but a permanent nave has now been erected, complete, with the exception of a tower, and it will be opened to-day (Friday) by the Bishop of Worcester. The total cost has been about £5,000. The nave is 83ft. long and 21ft. wide, and divided from the aisles by arcades each of five arches. The aisles are 72ft. long and 13ft. 6in. wide; width of church inside from north to south 52ft., north and south transepts 32ft. 6in. wide. The chancel, which is apsidal, is 32ft. by 19ft. 6in., and there are north and south chancel aisles, that on the north being used as an organ-chamber. The building is faced inside and out with white Leicester bricks, with bands of red Leicester bricks. The windows and columns of arcades and copings are of Bath stone. The work has been executed by Mr. John Webb, of Villa-road, Handsworth. Messrs. J. A. Chatwin and Son, of Birmingham, are the architects, and Mr. Meredith, of Aston, was clerk of works.

Edinburgh.—The plans have been passed by the Dean of Guild Court for the John Usher Institute of Public Health, the money for which, £20,000, was gifted some time ago by Sir John Usher, of Norton, to the University Court of the University of Edinburgh. The site for the building is on the south side of Warrender Park-road. The building, which will stand back a considerable distance from the street, will consist of three stories, in which will be provided a museum, chemical and bacteriological laboratories, three research-rooms, balance, optical, and dark rooms, water and gas analysis rooms, three scientific work-rooms, observation, disinfection, and incubating rooms, a reading-room, an extensive lecture-theatre, professor's private laboratory and retiring-room, a class-room for senior students, a caretaker's house of three apartments, &c., as well as basement accommodation for heating, incinerator, and water storage tank. The extract ventilation from the rooms and fittings will all be taken direct to the roof by means of fans, and the building generally will be heated by hot water. The flooring throughout will be fireproof. The walls of the principal elevations are to be built of grey stone ashlar from Doddington Quarry, lined with hollow brick inside. The exterior of the institution has been designed in a plain phase of Classic Renaissance, taking the form of two end blocks connected by a recessed centre part. The roofs are to be covered with red tiles. The contracts having been arranged, the work will be commenced at once, the total cost of the institute being about £20,000. A portion of the site will be reserved for extensions. The architects are Messrs. Leadbetter and Fairley, Edinburgh.

Hipperholme, Yorks.—Urban district council offices have recently been opened, and have been carried from designs by Mr. Joseph F. Walsh, selected in competition, at a cost of about £2,500. The site of the offices and surveyor's house contains an area of 691 square yards, and that for storeyards and sheds, &c., 993 square yards. The whole of the basement under the offices is cellared, and can be approached by a separate entrance from the side street and backyard. It is intended to be used for lamp and general stores, workshop, &c., and there is ample space for the provision of a few public slipper-baths when required. In the attics are large store-rooms. The external walls are of local delf dressed stone, with ashlar dressings. The roofs are covered with blue Westmoreland slates. The entrance vestibule, staircase, and council chamber are of polished oak, and the rest of woodwork pine and red deal. The entrance hall and corridor floors are of marble mosaic with glazed brick and faïence dadoes. The heating is by low-pressure hot water and American radiators. The whole of the work has been carried out by local firms in separate contracts under the superintendence of the architect.

Ipswich.—A new higher grade board school facing the Tower Ramparts was formally opened last week. It has been erected from plans by Messrs. J. S. Corder and Walter Brand, selected in competition. To meet some requirements of the Education Department, the original plans were considerably modified, in order that the space for playgrounds might not be encroached upon. The school has a frontage to the Tower Ramparts of 148ft., and comprises a main centre block, relieved by two gables; together with two slightly projecting wings, with similar gables. The material used is local red brick, and the façade is broken by cornices and string-courses in moulded bricks, obtained from the works of Messrs. Gunton, at Costessy, near Norwich. All the class-rooms are contained in the three stories to which this part of the building is carried up. The wings project to a considerable distance in the rear, east and west, and between the two there lies a central hall. There are double entrances at each end, for boys and girls respectively, and the asphalted playgrounds, divided by a wall, are each 256ft. long by 62ft. in width. The principal feature of the interior is the central hall. Its dimensions are 62ft. by 44ft., with a height of 26ft. to the wall-plate, and of nearly 40ft. to the ceiling of pitch-pine; there is a dado of glazed bricks, but the pointed red-brick work above it is otherwise left untouched, and the room is lighted from the rear or south side of the school. On the north side are three class-rooms, shut off from the main hall when in use by movable partitions. Above these divisions a wide balcony has been constructed, upon which three other class-rooms open, and the hall is completely overlooked from the teachers' apartments at each end through oriel windows, which also break up the blank wall space. The second floor is devoted to a long row of class-rooms, and on the third floor there are situated the physical and chemical laboratories and lecture rooms.

Reigate.—The foundation-stone of the isolation hospital for the borough was laid on Wednesday week at White Bushes, near Salfords. The administration block is three stories in height. It contains on the ground floor, committee-room, dispensary, matron's room, nurses' rooms, and linen store, general kitchen, scullery, pantry, &c. On the first floor, seven bedrooms, with a bathroom, lavatory, and w.c. On the second floor are seven other sleeping rooms, with bathroom, &c. The scarlet fever pavilion will afford accommodation for the reception of patients of either sex, but all suffering from one disease. To each bed is allotted 156ft. of floor space and a cubic space of 2,028ft.; the distance from centre to centre of the beds is 12ft. Two separate single-bed wards adjoin. Detached bathrooms, closets, and sinks are provided, and separated by cross ventilated passages. The wards will be warmed by means of open fires at each end. The windows are to be divided into two parts by a transom, fixed about 18in. down from the head of the frame. Below the transom will be ordinary double-hung sashes, provided with a deep bottom rail and a sill-board. In addition to the windows, openings will be made just above the floor level behind each bed, and provided with special inlet ventilators. The walls will be plastered with Portland cement, upon which will be placed a coat of Parian cement. All angles of walls, floors, and ceilings will be rounded off. The floors of the wards, hall, duty-rooms, and annexes will be laid in terrazzo. The isolation block consists of two wards of two beds each, and a nurse's duty-room with the necessary offices, and the diphtheria block will consist of two wards of four beds, a nurse's duty-room, with bath-room, &c. The laundry block will be situated some distance from the hospital buildings. The mortuary will also be a separate detached building, and will be fitted up for use as a *post-mortem* room. The discharging block will consist of an undressing room, bath-rooms, and dressing-room. With regard to drainage, each block is dealt with independently, the main drain from each being conducted to the sewer separately, and an intercepting chamber will be placed between the sewer and each block. The whole of the buildings will be lighted by electricity, generated in the laundry block. The buildings have been designed by Mr. W. H. Prescott, the borough surveyor. Messrs. Longley and Co. are the contractors, and Mr. Fitts is the clerk of works.

Sydenham.—On Saturday, the new orphanage, known as the "Passmore Edwards House for the Orphans of Teachers," was opened in connection with the Teachers' Benevolent and Orphan Funds of the National Union of Teachers for the sons of deceased teachers, the opening ceremony being performed by Mr. J. Passmore Edwards. The orphanage, which was illustrated by us last week, is situate at West Hill, Sydenham, and was formerly known as Westwood House, having been built from designs by the late Mr. J. L. Pearson, R.A., nearly twenty years ago. Thanks to the munificence of Mr. Passmore Edwards, who gave £6,000 for the purpose, the council of the funds have been enabled to purchase the mansion and its five acres of ground from Mr. C. J. Whittick Rabbits for £10,000. The London teachers set themselves the task of raising not only the remainder of the purchase-money, but £6,000 in addition towards the cost of adapting and furnishing the new home and forming the nucleus of an endowment fund for its maintenance, and so far have succeeded in securing £7,300. The former home, now vacated, is situated at Peckham Rye, and for years its accommodation has been inadequate. It was opened in 1884 by the Baroness Burdett-Coutts, and since that time 126 orphan boys have been maintained, the teachers of the country having spent £15,263 on the institution. There is a similar home for orphan girls at Sheffield.

Stoke-on-Trent.—The new mission church of St. Barnabas, situated on Penkhull Allotments, was dedicated on Thursday in last week by the Bishop of Lichfield. The church supersedes an old mission building, and is designed as the south aisle of the intended church, when complete, and at the east end is temporarily fitted up with chancel, organ-chamber, vestry, and choir-stalls. This space will be available as part of the future aisle, which on completion will accommodate 342, whilst at the present stage the accommodation is for 240. The style is Jacobean. There is a temporary porch at the west end; also a vault for the heating apparatus. A small bell-cot surmounts the west gable, and an iron cross terminates the east gable. The length of the present church is 66ft. and the width 27ft., and it is 19ft. to the wall-plate, with a roof of square pitch. The walls are built with brindled red and blue brick external facings, and are not plastered inside, but coloured in duresco. The trusses and purlins of the roof are open, and it is ceiled to the rafters in plaster, with moulded panels in the interspaces. The dressings to the windows, buttresses, and door are of local fireclay, manufactured by Messrs. Warrington and Sons. Lead lights, with tinted cathedral glass, fill the windows, which are fitted with hopper casements. The heating is by the low-pressure hot-water system. The flooring is of wood blocks in the body of the church, and boarded in the temporary chancel. The north wall is built for removal when the time for extension comes. Chairs are provided for seats, and the choir-stalls are formed out of benches which came from the parish church. In the chancel is the stone altar slab which was erected in the ancient parish church of Stoke-on-Trent in the first half of the 13th century. This altar slab for many years laid on the ground in the churchyard forgotten and broken. Mr. Councillor Price is the contractor, the tender for building and fixing being let to him for £1,000. Messrs. Lynam, Beckett, and Lynam, of Stoke, are the architects.

Tooley-street, S.E.—The new public offices erected for the St. Olave's Board of Guardians were formally opened yesterday (Thursday). The offices face the main thoroughfare, and in an attached building at the rear are the relief station and dispensary. Upon the ground floor of the front building are the registrar's private and general office, offices for the general relieving officer and collector, with porter's box, waiting-rooms, &c. On the first floor are the clerks', general and private offices, and strong rooms, committee-rooms, waiting-rooms, and offices, and at the back the board-room, 50ft. by 30ft., with access for reporters, gentlemen's and ladies' retiring rooms, and back staircase. The second floor and roof will be fitted up as a store for books, stationery, &c., and the basement also as stores and strong rooms. The relief station is entered from Shad Thames. In the centre and under the board-room is the large general waiting-room, with two relief committee-rooms, and on each side the necessary number of rooms for medical officers and relieving officers. Upon the right hand are the dispensary and vaccination station, with the requisite consulting rooms, and over the dispensary the rooms for the caretaker. The exterior of the building is faced with red Dumfries stone dressings, and the roofs are covered with green slates. Messrs. Newman and Newman are the architects, and Mr. J. Bullers, of George-row, Bermondsey, is the contractor.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

RECEIVED.—J. J. and Co.—T. L. W.—Secretary.—O. M.—One Who Will Not Compete Again (too long).—Bricklayer.—Part-Owner (answered elsewhere, surely!).—Compass.

DRAUGHTSMAN.—Cannot say. Try Clarkson, 28, Bartlett's-buildings, Holborn Circus, for mathematical instruments, &c.

RECTOR.—Put the work in Mr. Curtis's hands. You will see a very fair example of his domestic glass among our illustrations next week.

WATER SUPPLY.—Nothing to beat a good hydraulic ram. Write John Blake, Oxford-street Works, Accrington.

D. S.—We think it is as well that professional men connected with local bodies should *not* be shareholders in newspaper or other undertakings with which they may be concerned in their ordinary professional relations. We do not believe it would make an atom of difference to 999 out of a thousand; but weremember a case some years ago where advertisements were diverted from the recognised trade paper and given to a fifth-rate medium with no circulation, simply because the official was a shareholder. For the rest, you can see the list of shareholders in the company you name at Somerset House on the payment of a shilling.

QUANTITIES.—Try Mr. W. Hardaker, 15, Furnival-street, E.C. You will find his name in our "Directory."

CURATOR.—You can get the bevelled glass of John M. Newton, 21, Charles-street, Hatton Garden.

IN DOUBT.—Professor Cockerell was buried in St. Paul's Cathedral.

J. R. M. AND Co.—He spent a good part of his life in Spain, but did not die there. He was a most simple-minded, lovable man.

◆

Intercommunication.

QUESTIONS.

[12326.]—**Turning Granite.**—Will any reader inform me the way to turn granite in the lathe, the kind of tool used, and how to polish it after it is turned? Will some of our Aberdonian readers reply?—J. E.

[12327.]—**Gas.**—Would any of your engineering and gas-managing readers please inform me of the last cheap book on gas manufacture, works, plans, &c.?—GAS.

[12328.]—**Height of Buildings.**—It used to be considered that the height of buildings should never exceed in amount the width of the road on which they fronted; but I have recently noticed a new block of flats now roofed-in at Kensington fronting to an old road, where the building is about 80ft. high, though the road is only 40ft. wide. Pray, under what rule or law is this?—P. Y. H.

[12329.]—**Special Fittings.**—I want to include in a contract for a building certain ironmongery articles, fastenings for doors and windows, stoves, kitchen ranges, and should like to ask an experienced reader the best way to guarantee their use. Is it enough to specify the articles, giving their description or numbers in catalogue, and allow the contractor to obtain and fix them? Or would it be better to provide a certain sum for the articles, and retain the power of selecting the goods from the several firms? Under the first plan the architect has often a difficulty in getting what he wants—the goods supplied are often of inferior quality, or some article answering the description is substituted for the kind desired. Also, is it better to obtain the concurrence of the employer in selecting goods under the latter plan, than to make your own selection? These are questions of interest to many architects besides myself, and an opinion would be welcomed.—A COUNTRY PRACTITIONER.

[12330.]—**Classes and Lectures.**—Will any better-informed student than myself say which course is the most profitable for one who has served his articles, and is now wishing to prepare for the examinations? What are the preparatory courses? I am told the curriculum of the Association is in two divisions, and two courses in each—lectures and classes, and the studio course. Which of these would be most desirable for one who has obtained a fair office training, but has still much to learn of theoretical and practical matters? What are the fees? Any suggestion will be esteemed by—A STUDENT.

[12331.]—**Plane and Solid Geometry and their Application.**—I have two or three treatises on practical geometry, but neither of them appear to give any information that will be of use to the architect in the setting out of work, drawing tracery, mosaics, or patterns of tesselated paving, ornament, &c. Will someone tell me of a good textbook where I may find exercises of this description?—A. G.

[12332]—**County Council Regulations as to Public Rooms.**—Are these necessary in converting old premises into a public lecture-hall, or do they apply to new buildings only? An answer will oblige.—A MANAGER.

[12333.]—**Raising Buildings.**—On the question of "ancient lights" the building owner is at the mercy of meddlesome and litigious "adjoining owners." How should he proceed if he wishes to avoid their interference and giving offence, should he wish to add an additional story to his premises?—FRIENDLY NEIGHBOUR.

[12334.]—**Right of Support: Compensation.**—A neighbour, by putting in a new front, has caused a slight settlement of the wall of my house, and the ceilings are cracked in consequence. Can I look to him for reparation? I should like to be informed of the law in such a case, and what length of time gives the owner of a building a right to support?—LESSEE.

◆

CHIPS.

The leading inhabitants of the town of Olney have met together to consider what steps should be taken in reference to the gift—the home of the poet Cowper—offered to the town by Mr. W. H. Collingridge. The famous parlour and Cowper's hall (now a passage with small room adjoining) will be used as a public library and a Cowper and Newton museum. In the event of this scheme being carried out, Mr. Collingridge intends to present his collection of Cowper and Newton relics to the museum.

In the village of Sledmere, Sir Tatton Sykes rebuilt the church, as illustrated by us a few weeks since, and has also erected a Queen Eleanor cross, which is a picturesque object at the junction of the York and Malton roads. The cross is of Portland stone, stands 55ft. in height, and from the ground to the cresting of the first stage it is octagon in plan, and from thence all is square, excepting the second stage, which has a niche projecting from each face, so forming a cross on plan. The figures were executed in the studios of Messrs. Thompson, at Peterborough, who are also the builders of the cross, from designs by Mr. Temple Moore, of Hampstead.

A comprehensive and successful exhibition of arts and crafts, promoted by the Free Libraries, Art Gallery, and Museum Committee of the Oldham Corporation, was formally opened on Monday by the mayor. The exhibition, which is being held in the galleries usually devoted to art, comprises over 700 separate exhibits of needlework, wood-carving, manual class work, metal work, pottery, bookbinding, fancy leather work, book plates, photography, and various interesting miscellaneous specimens of industrial and domestic art.

Mr. Walter A. Ducat has held an inquiry at Keswick into an application made by the urban district council for power to borrow £13,000 for water supply and street improvements.

A memorial window, erected in St. Kessog's Episcopal Church, Auchterarder, to the memory of Miss Agnes C. Johnston, of Kincardine Castle, was dedicated on Sunday. The window, which is of three lights, contains scenes from the life of St. Agnes, a young Roman maiden who suffered martyrdom for the Faith in the persecutions under the Emperor Diocletian. The artist was Mr. C. E. Kempe, London.

Medmenham Abbey, Bucks, is in the market, after being restored at a cost of over £10,000. The lease of the abbey is to be disposed of, and "as much land can be secured as desired."

The foundation-stone of a new church was laid at Stepps, near Glasgow, on Saturday. The building will be Early Pointed in style, and will be built of red Ballochmyle stone. Sittings will be provided for 400 persons, the total cost being £2,400. Mr. P. Macgregor Chalmers is the architect.

An inquest on the body of Arthur Farnesworth, who was killed by falling from the top of the chimney stack at the electric works, Hereford, was held on Friday. The man was engaged at the set-off at the top of the chimney, helping another man to fix the lightning conductor, when he suddenly lost his hold, and fell to the ground, a distance of 95ft. When picked up he was found to be dead—in fact, there was hardly a bone in the body left whole. The jury returned a verdict of "Accidental death." The deceased was thirty-eight years of age, and came from Borrowash, Derbyshire. This is the first accident that has happened during the erection of the new electric-light works, for the building of which Mr. W. P. Lewis is the contractor.

A technical college is about to be erected at Wigan, at a cost of £40,000, from plans by Messrs. Briggs and Wolstenholme.

Judge Jones, sitting as arbitrator at the Bury (Lancs) County Court, awarded £247 11s. 7d. to Margaret Lee and her two children against the Bury Corporation as compensation for the death of the husband and father, John Lee, who was asphyxiated at the Bury gasworks on Jan. 4 last while following his employment. The Corporation opposed principally on the ground of serious and wilful misconduct, but his Honour held the evidence on this point to be of the weakest character.

The Perth County Road Board have issued a report of their proceedings, from which it appears that the total cost in maintenance and management of the roads in the county of Perth for the past year was £34,407 7s. 3d. for a total mileage of 1,473, which brings out an average cost of £23 7s. 2d. per mile.

The remaining window of the parish church of Kettins, N.B., has now been filled with stained glass as a gift from the tenantry of the estate of Lintrose to the memory of Anne Murray, of Lintrose. The subject selected for illustration was that of Dorcas, who is represented as presenting clothing to the poor. The window is from the studios of Messrs. A. Ballantine and Gardiner, Edinburgh.

The parish church of Eccleshall, Staffs, was dedicated by the Bishop of Lichfield on Wednesday week after the completion of restoration of the nave and tower at a cost of £11,000. The baptistery and south porch and other portions of the church were restored in 1868 at an expenditure of £8,000, from plans by the late Mr. G. E. Street, R.A. The present works, for which Mr. Basil Champneys, B.A., was the architect, include the rebuilding of the upper part of the tower and the addition of eight massive pinnacles at the angles. Mr. Bridgman, of Lichfield, has carried out the present restoration.

The Local Government Board have declined to sanction a loan for £2,700 for the erection of an isolation hospital for the Colwyn Bay district. The principal objection relates to the unsuitable character of the approach to the proposed site.

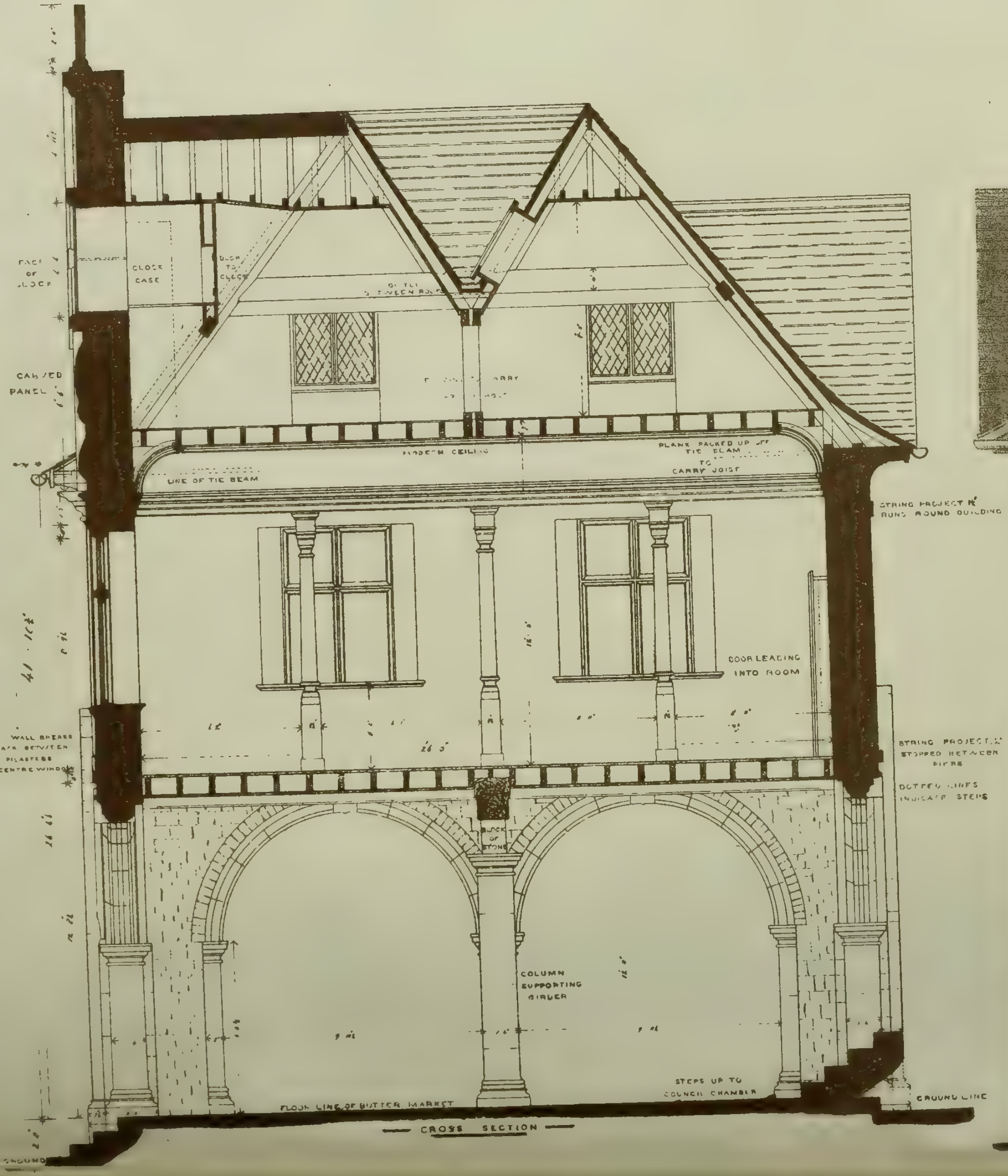
At Montrath, Queen's County, last week, the Rev. Sir Algernon Coote, Bart., presented the townspeople with a high-pressure water-supply and a public drinking-fountain, constructed at his expense and from plans prepared by Mr. William J. Haslam, M.A., M.Inst.C.E. The supply is brought a distance of three miles and furnishes 26 gallons per head to the population. The fountain is of Connemara granite and marble, mounted on a base of Wicklow marble.

The new Lightfoot aisle of St. Margaret's Episcopal Church, Braemar, was consecrated by the Bishop of Aberdeen on Thursday in last week. The aisle is built of coloured granite and freestone, both from Aberdeenshire. The roof is of local quarried slate from Old Mar Lodge, having served as a roof to that building, now demolished. A new chancel, tower, and vestry are about to be erected.

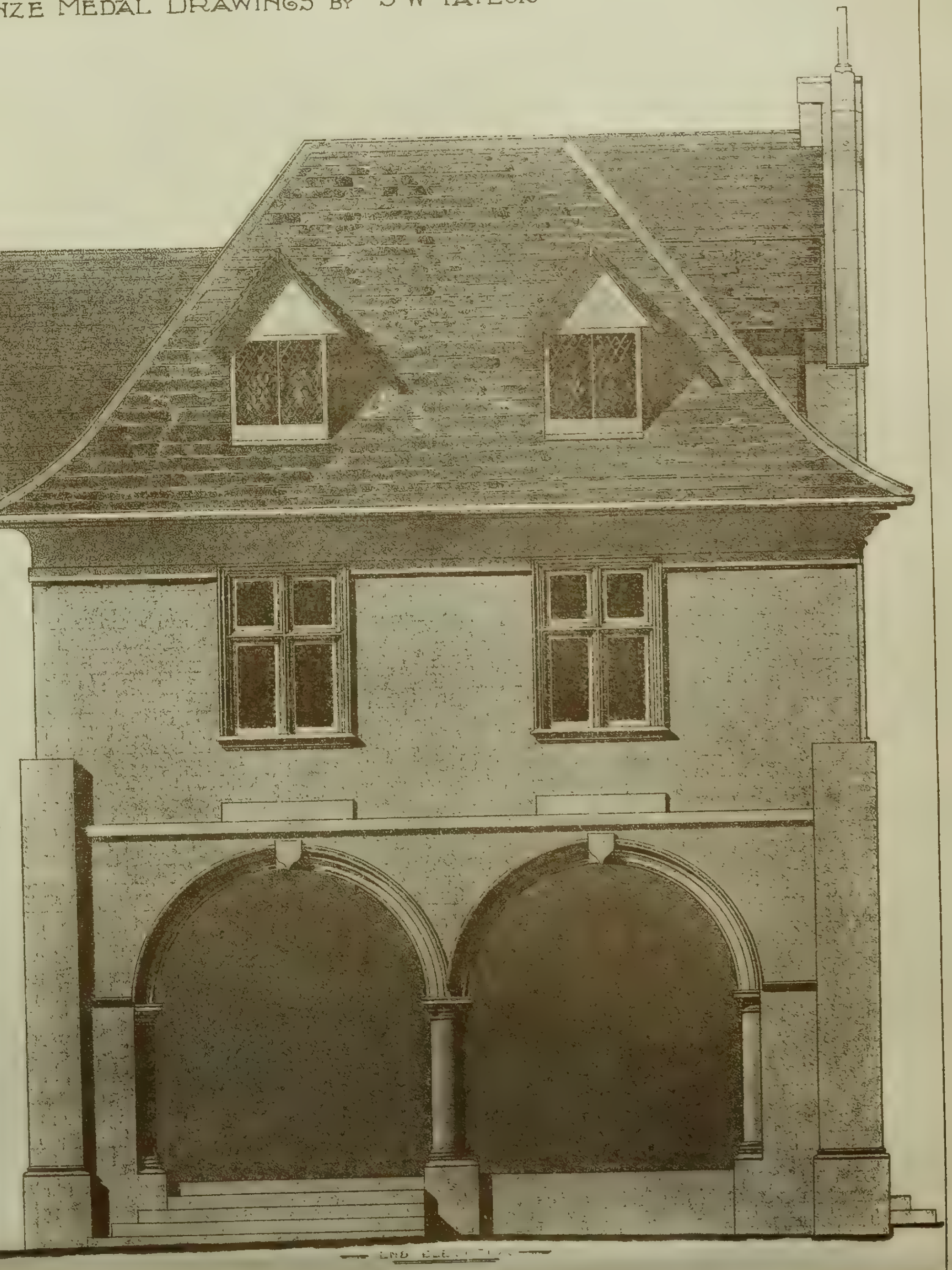
An inquiry was held last week at the town-hall, Milton, next Sittingbourne, by Mr. H. H. Law, C.E., one of the inspectors of the Local Government Board, respecting the application of the Milton Urban District Council for a loan of £7,000 for works of sewage disposal.

A correspondent, "F. L. R.," calls attention to the lamentably dilapidated and unprotected condition of the ruins of Basingwerk Abbey, near Holywell, observing:—"Within my recollection the hand of Time has made sad havoc with this fine old ruin, and every year tells its tale. The abbey is private property, and it is greatly to be deplored that the proprietor apparently takes so little interest in it."

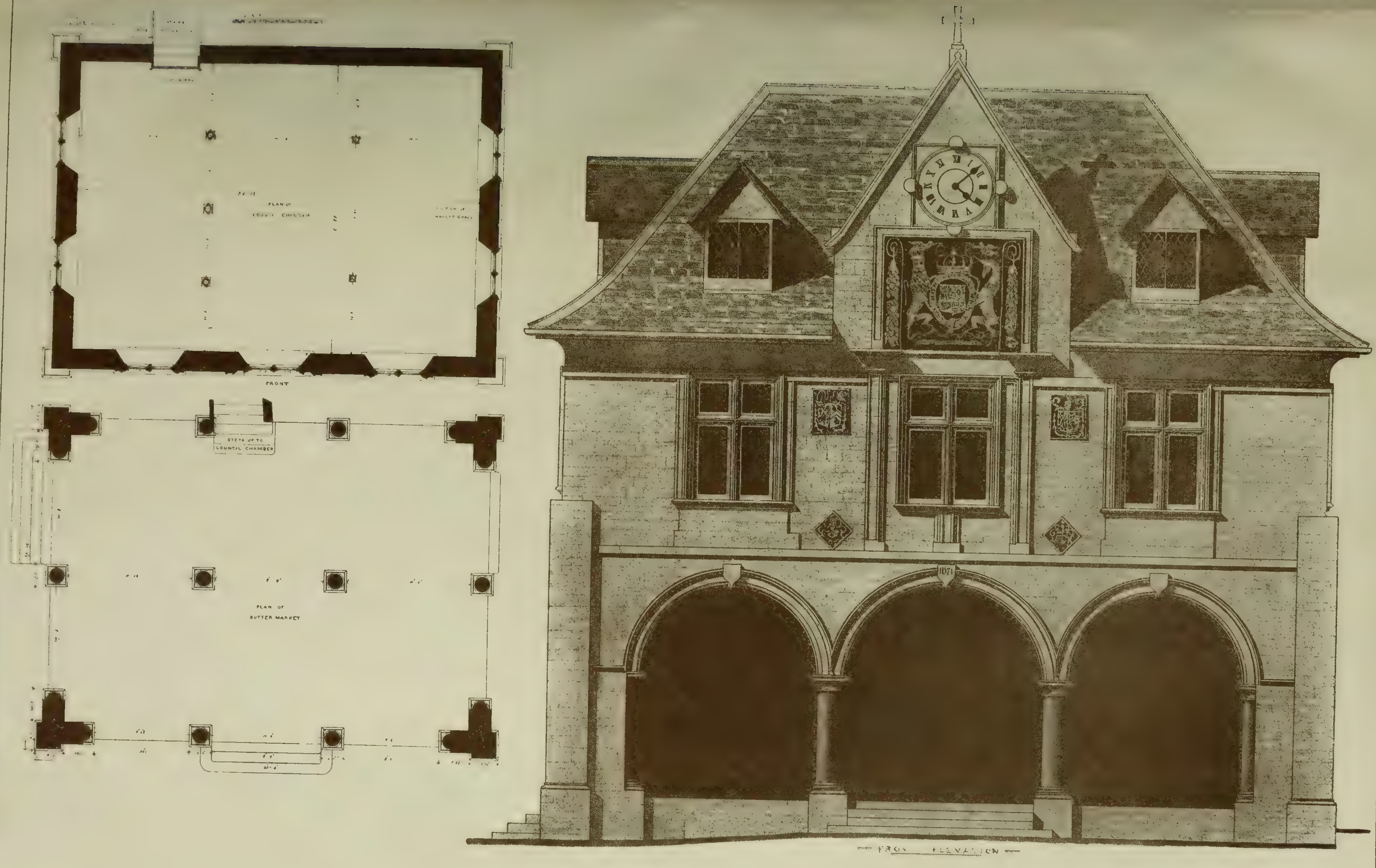
PETERBOROUGH TOWN HALL NATIONAL BRONZE MEDAL DRAWINGS BY S·W·TAYLOR


FACE OF CLOCK
CLOCK CASE
DOOR TO CLOCK
CARVED PANEL
LINE OF TIE BEAM
MODERN CEILING
PLANK PACKED UP OFF TIE BEAM TO CARRY JOIST
STRING PROJECT ½" RUNS ROUND BUILDING
DOOR LEADING INTO ROOM
WALL BREAKS BACK BETWEEN PILASTERS CENTRE WINDOW
STRING PROJECT ½" STOPPED BETWEEN PIERS
DOTTED LINES INDICATE STEPS
BLOCK OF STONE
COLUMN SUPPORTING GIRDER
STEPS UP TO COUNCIL CHAMBER
FLOOR LINE OF BUTTER MARKET
GROUND LINE
GROUND
41 · 10½

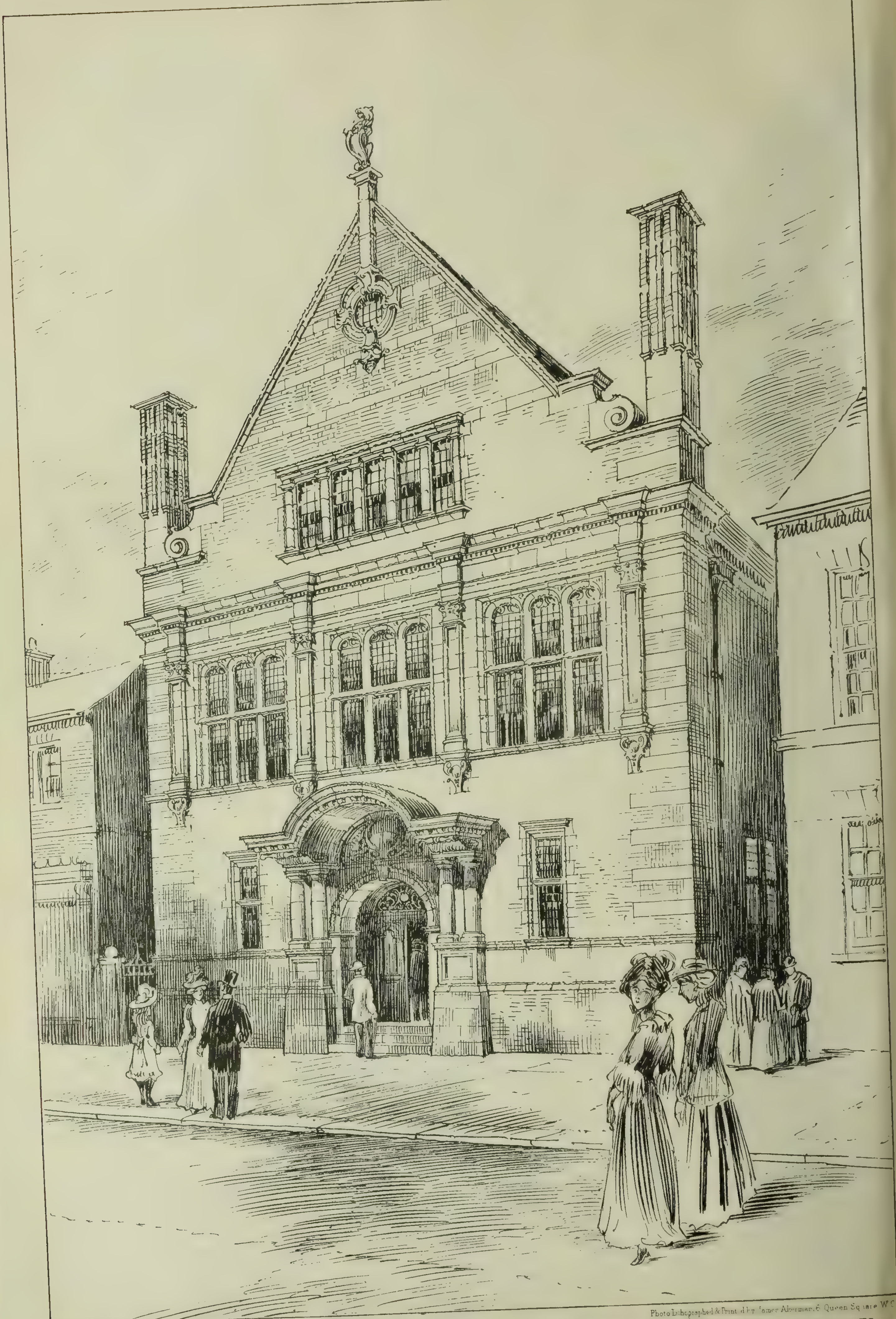
CROSS SECTION



END ELEVATION



"PHOTO-TINT", by James Akerman, 6 Queen Square London W.C.



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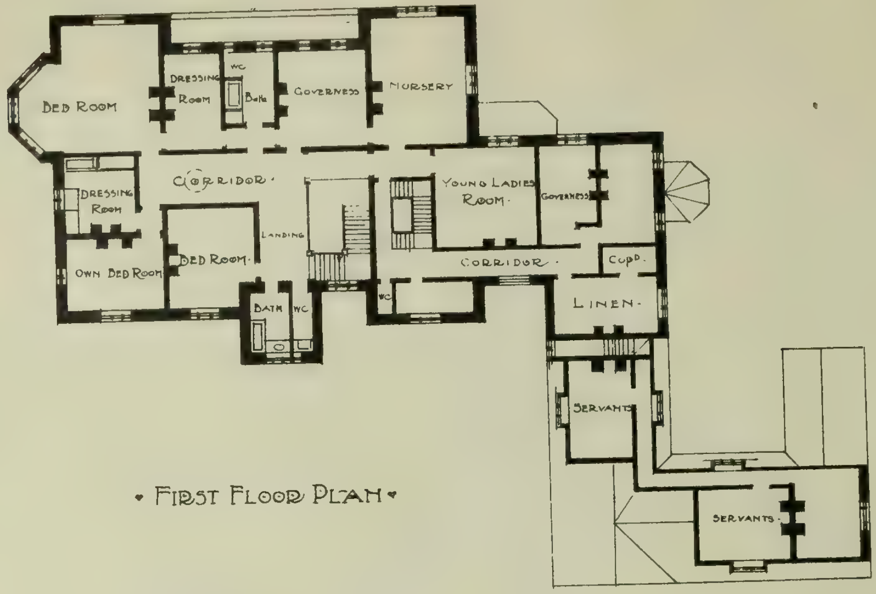
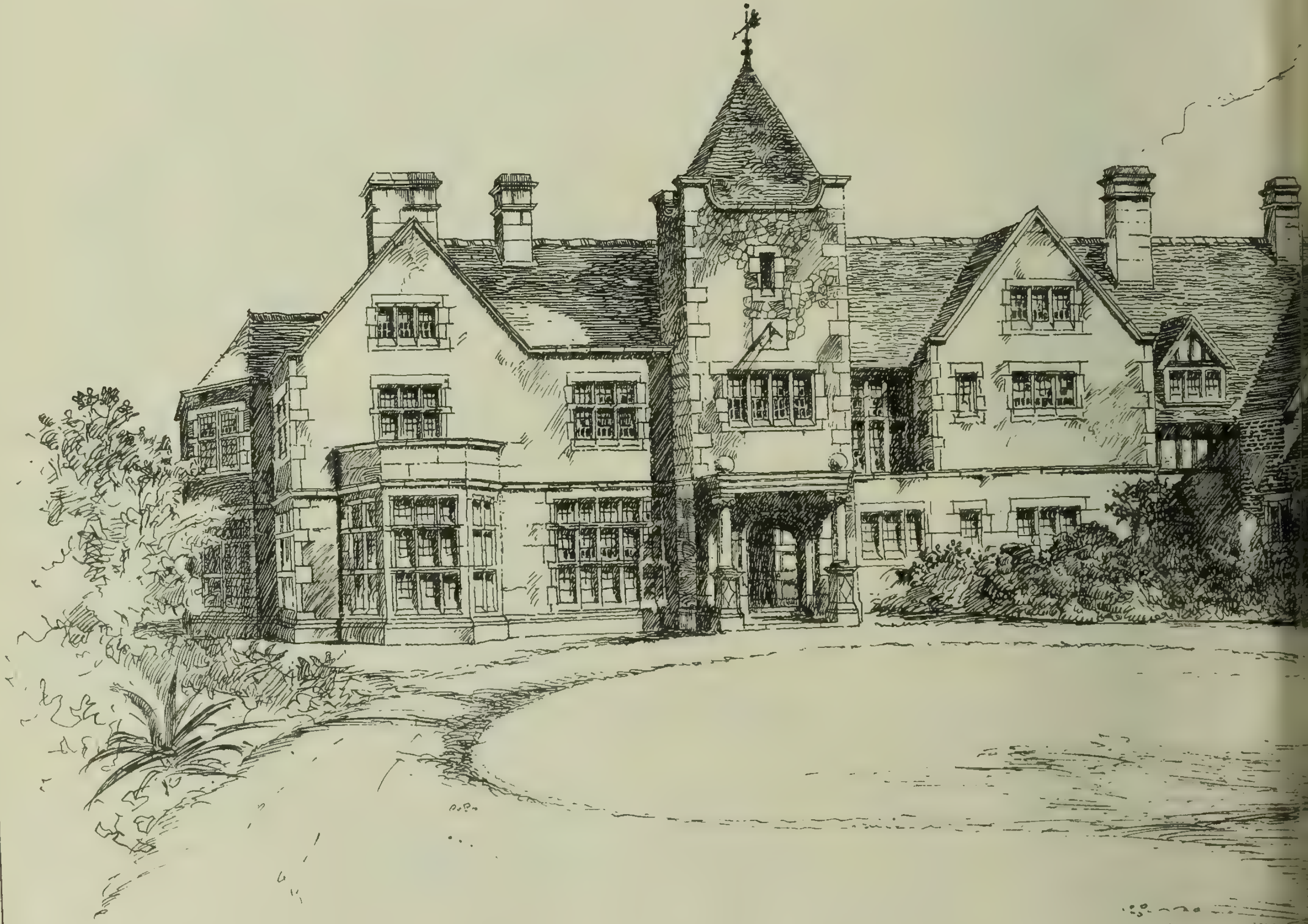
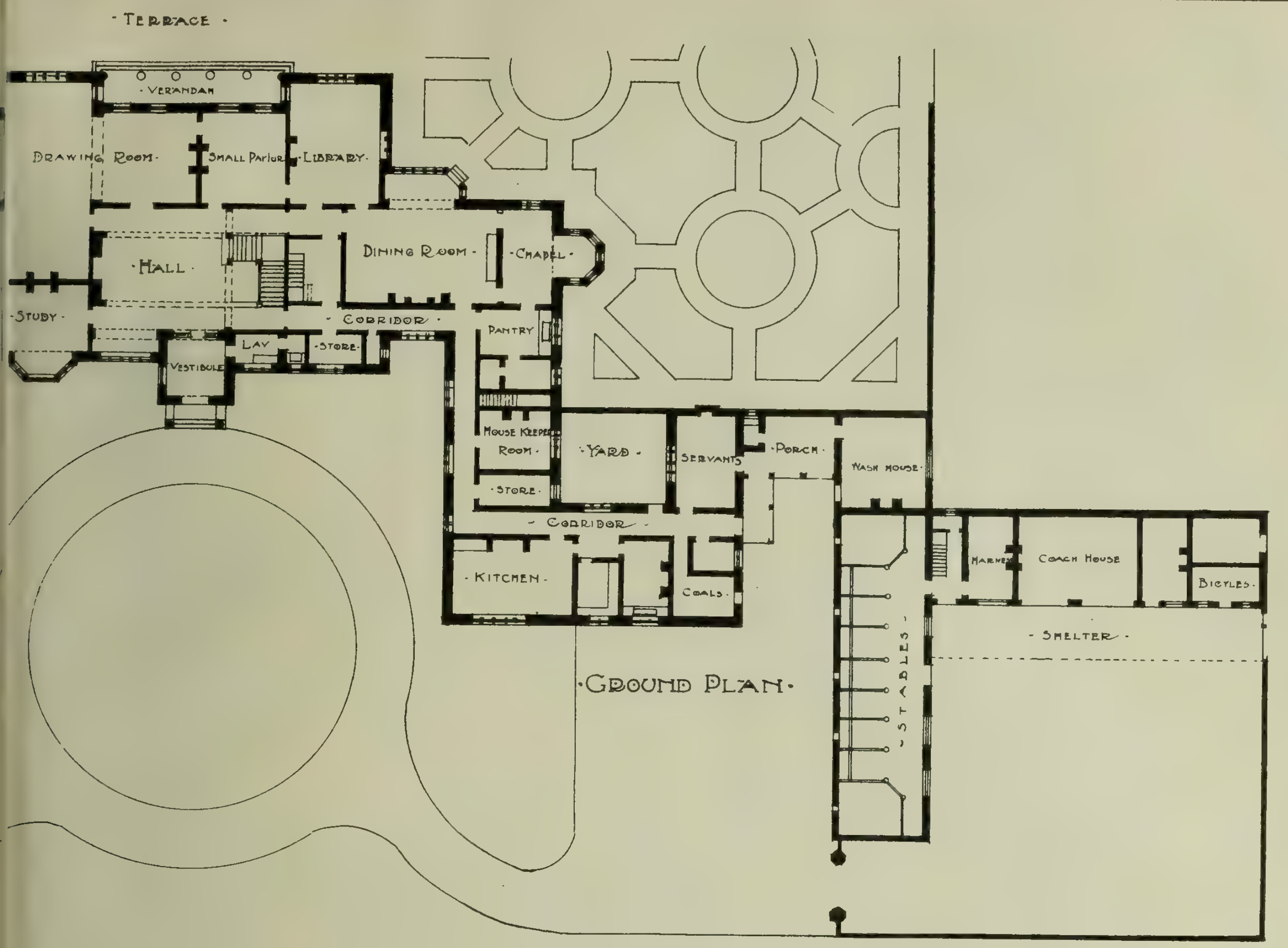
MASONIC HALL ALDERSHOT ~ 1ST PREMIATED DESIGN ~ COGGIN AND WALLIS ARCHTS



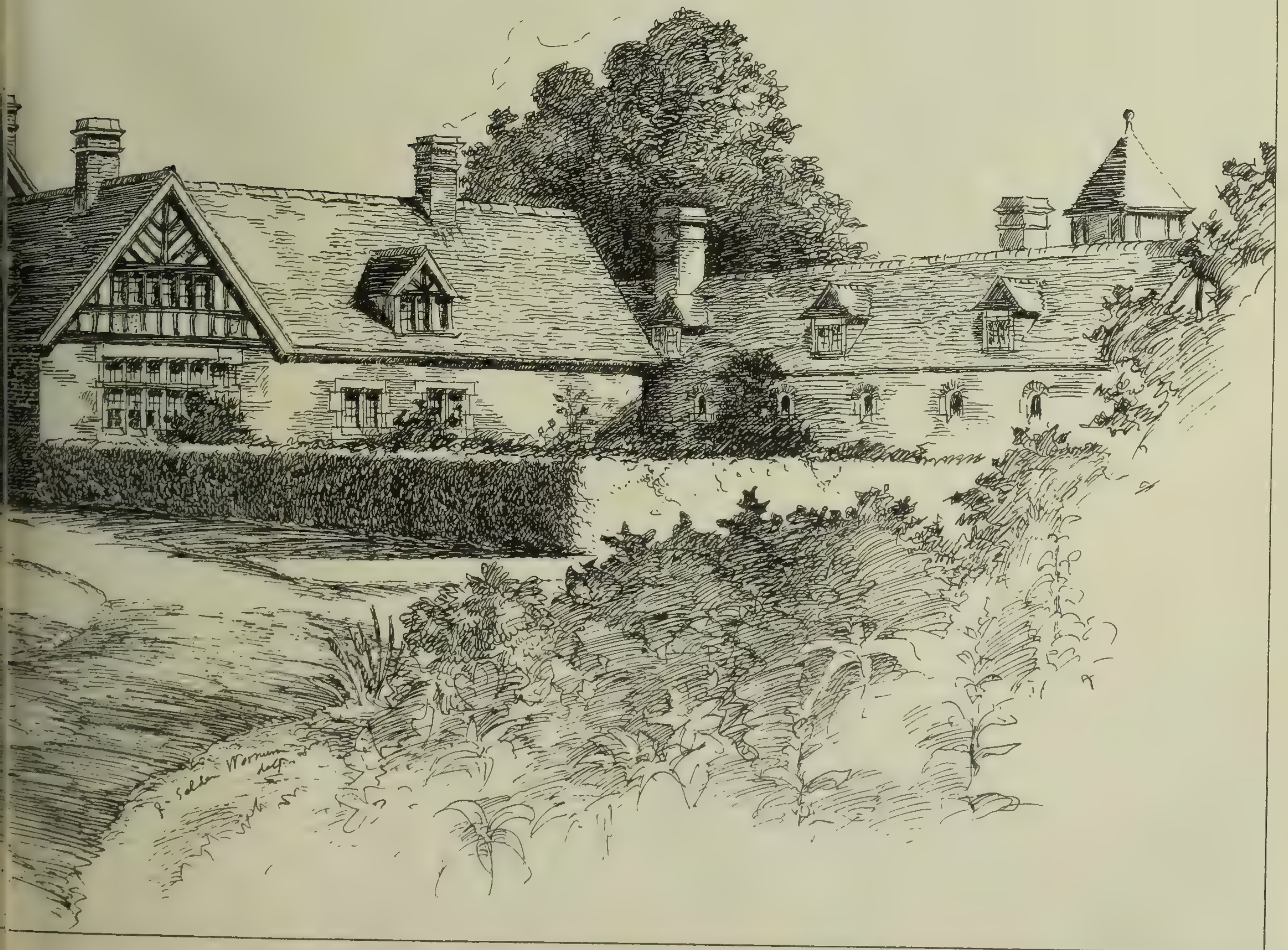
• FIRST FLOOR PLAN •



• LAS FRAGUAS SANTA



· GROUND PLAN ·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PAIN RALPH · S · WORNUM ARCH^{T}

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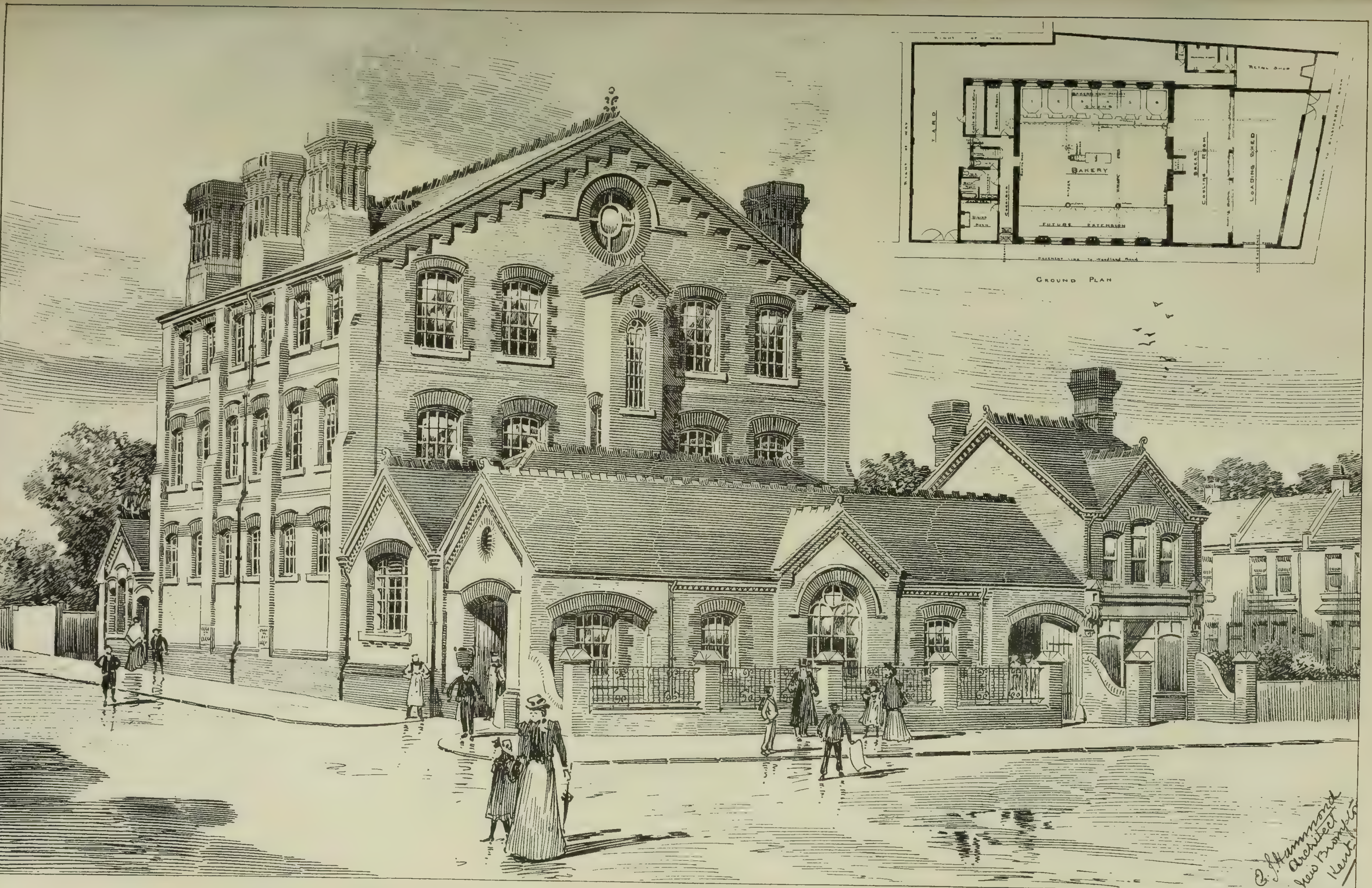

NEW BROMPTON CO-OPERATIVE SOCIETY'S BAKERY.

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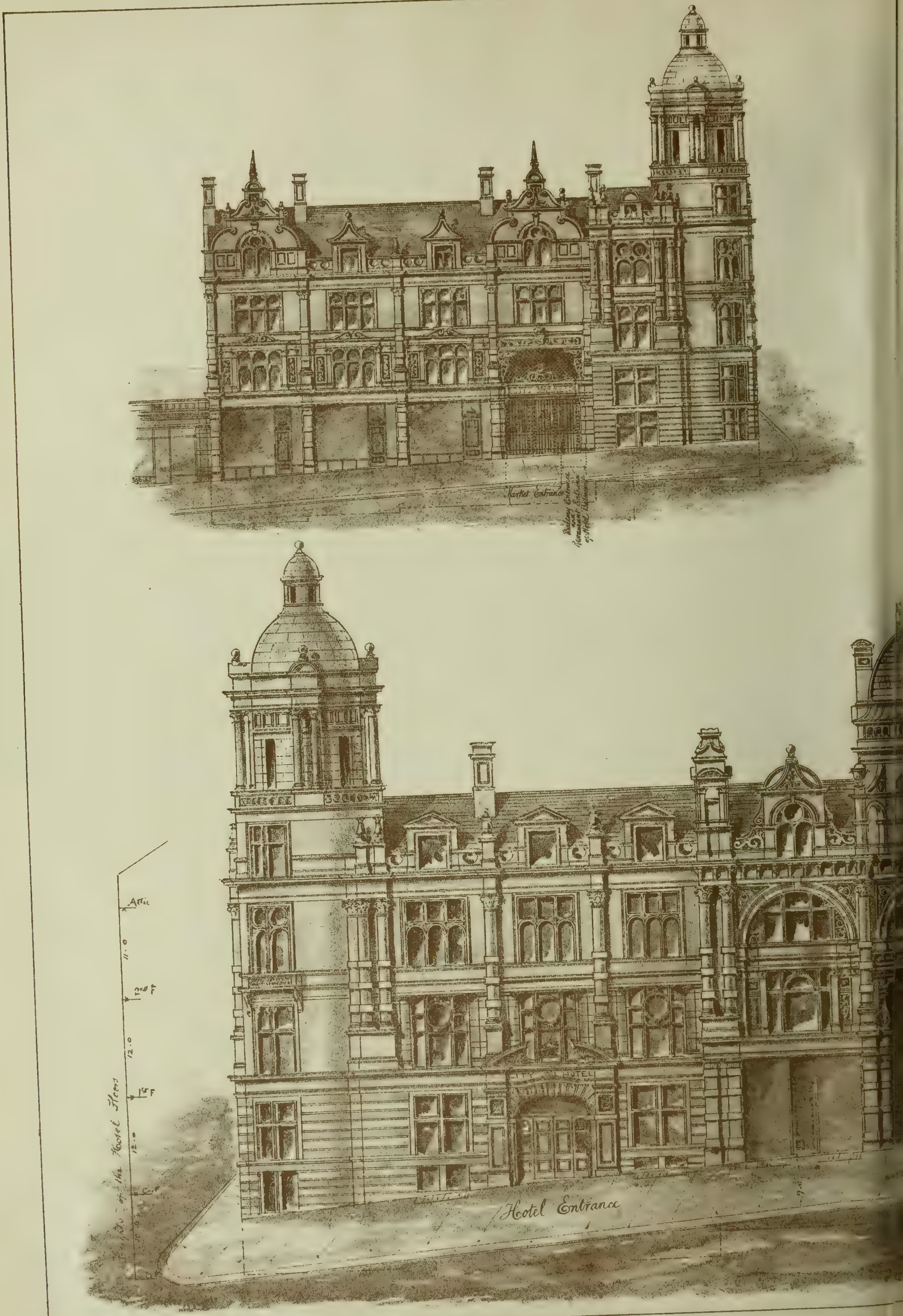
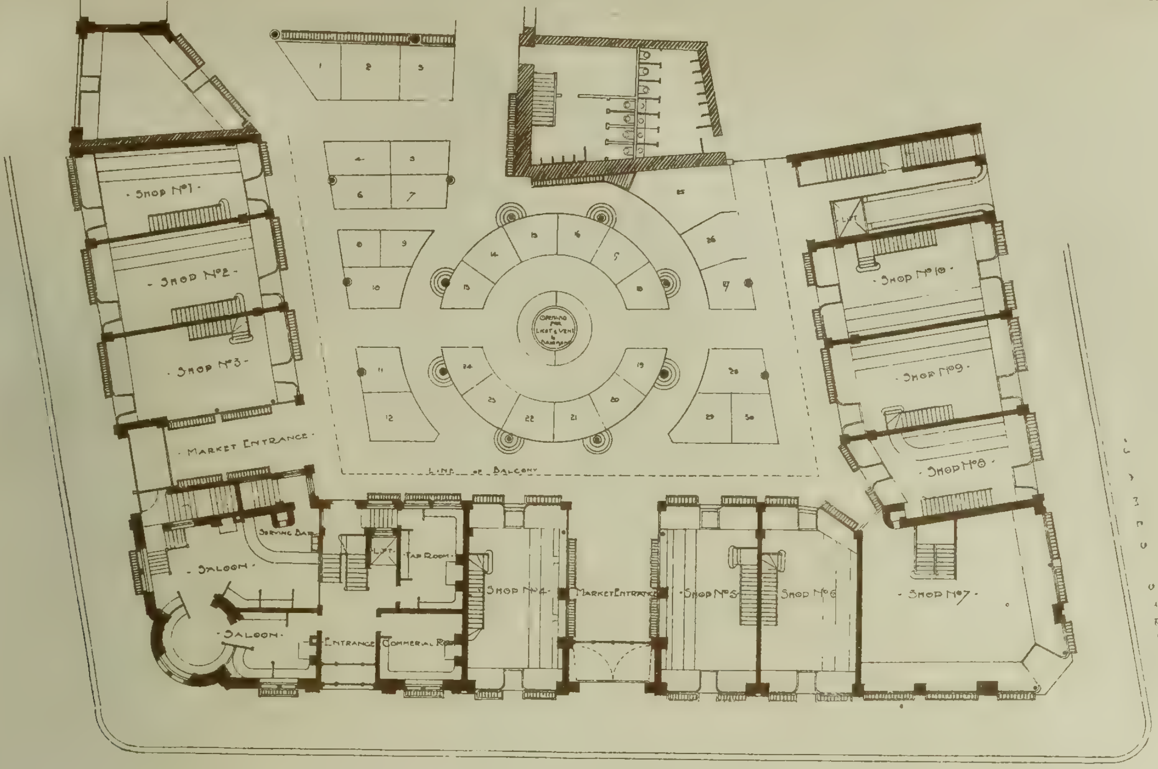
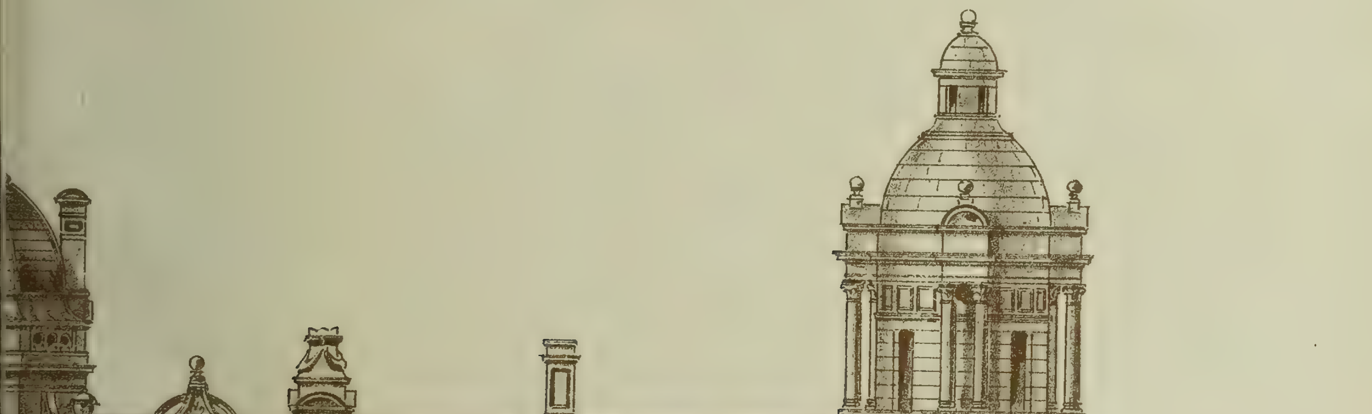


BRADFORD MARKETS · FIRS



- Ground Floor Plan -



...TED DESIGN · T C HOPE AND SON ARCHTS

"PHOTO-TINT" by James Akerman [illegible] Queen Square London [illegible]

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ILLUSTRATIONS.

LAS FRACOAS, SANTANDER, SPAIN.—PETERBOROUGH TOWN HALL.—BRADFORD MARKETS: FIRST PREMIATED DESIGN.—NEW BROMPTON CO-OPERATIVE SOCIETY'S BAKERY.—MASONIC HALL, ALDERSHOT.—COLLIERS' AND WORKERS' HOMES.

Our Illustrations.

LAS FRACOAS, SANTANDER.

This house is being built for the Duke of Santo Mauro a few miles south of Santander. He wished it to look quiet, and as much like an English house as possible. It is being constructed of rough masonry, with ashlar dressings. Red brickwork and half-timber are being used for the offices and stables, and all the roofs are to be covered with a red flat tile, something like "Broseleys." The architect is Mr. Ralph S. Wornum. Our illustration is taken from the architect's drawing at the Royal Academy.

PETERBOROUGH TOWN HALL: NATIONAL BRONZE MEDAL DESIGNS.

The Town Hall was erected by the citizens of Peterborough, by public subscription, in the year 1669. A dinner was given at the opening ceremony (in the museum is the shell of a turtle from which the soup was made for the dinner). In the year 1870 a so-called restoration took place, when the fine wall panelling and three fine bosses from the ceiling were wantonly destroyed, and sold as lumber on the Hill. One panel has been recovered, and is now used by the Corporation to inscribe upon it the names of the mayors at the expiration of their term of office. The three bosses have also been recovered by the energetic secretary of the museum, and placed in the same. Since the incorporation of the town the building has been used for municipal purposes, the first floor being used as a council chamber, and the mayor's room adjoins. The ground floor is used as a butter market, which is held on Saturdays. The following notes may also be of use. They are from the cathedral register of burials:—"John Gutche, carpenter, came to work at the New Town House (hall), fell sick, and was buried 1669." "Feb. 6, 1744-5. The secretary of the Gentlemans Society of Peterborough exhibited the original subscription list for building the cross or Town Hall, A.D. 1669, which amounted to no more than £80 12s. 2d." "By the Chapter. To ye workmen at the laying of ye foundation at Market Cross, July 2, 1669, 2s."

S. W. Taylor.

BRADFORD NEW MARKETS.

(For description, see page 400.)

THE NEW BROMPTON CO-OPERATIVE SOCIETY'S BAKERY.

This building, known as the "Model Bakery," is designed entirely for the manufacture of bread, cake, pastry, and confectionery. The ground floor has a commodious loading shed to the front, where the vans are loaded from the cooling room, which is divided off by revolving shutters so arranged that the cooling of the bread is not affected to any extent while vans are being loaded. From this cooling-room there are two entrances to the bakery proper, which is 60ft. square and 15ft. in height; it has six ovens upon one side, with space for a similar number on opposite side when required. Passing through a doorway at the far end, we come to a corridor from which the dining-room, lavatories, engine-room, coal-store, &c., are reached, with a doorway opening into yard. In one corner of the bakery is the staircase leading to first floor; here are spacious kneading and sponge rooms (the latter fitted with hot-water apparatus to regulate the temperature), and a pastry and cake bakery, with provision for two ovens. On the top floor is the flour-store, capable of storing between 2,000 and 3,000 sacks of flour. The three floors are connected by a lift, fitted with automatic safety gear, the lift-well having openings both sides at bottom, so that the lift may be emptied or loaded with equal convenience from either bakery or cooling-room; it is worked, with the other machinery, by a gas-engine. The building is substantially built, having white glazed bricks in all internal walls; the floors are fireproof, and covered with wood blocks, carried with steel joists on girders, supported at intervals by columns, four to each floor; the roof is spanned by wrought-iron principals, and covered with slates. The exterior walling consists of best local stock bricks, with red bricks to all arches, strings, quoins, and gable and eaves-courses relieving the whole. Mr. E. J. Hammond is the architect, and Mr. Councillor J. H. Harris, of Chatham, was the builder. There is a retail shop adjoining, with the usual stores and offices to same. The whole has been erected at a cost of between £8,000 and £9,000.

ALDERSHOT MASONIC HALL AND CLUB: SELECTED DESIGN.

This design was chosen from sixteen sets of plans in the recent competition. Mr. E. O. Sachs was the professional assessor. On either side of the main entrance, which is central, are two offices for club purposes, or which can be let if found financially necessary. This entrance leads to a spacious hall, which is provided with lavatories for ladies and gentlemen. On the right is the candidates' preparation room, with store adjoining for Masonic furniture, and Tyler's lobby leading into the Masonic temple. On the left is a corresponding lobby leading into the large dining-room, with service-room adjoining, which communicates by lift and staircase with wine-cellars in basement, club service-room on first floor, and kitchen on second floor. An entrance is provided at the side of building to inner hall, to enable the dining-room and adjacent rooms to be let for balls, dinners, &c., without in any way interfering with the Masonic club on first floor. The club is approached by a staircase in vestibule, and is kept distinct from other parts of buildings by double doors at entrance to inner hall. It contains large hall with service-room and refreshment bar, cloak-room, lavatory, large reading-room, card-room, and billiard-room to contain two full-sized tables. The kitchen and scullery, as also the caretaker's apartments and stores, are placed on the second floor. The architects are Messrs. Clarence T. Coggin, A.R.I.B.A., and Thomas Wallis, of York Buildings, Adelphi, W.C. The following lodges will be worked at the hall: The Panmure No. 273; Aldershot Camp No. 1331; Army and Navy No. 1971; Military Mark No. 54; Army and Navy Mark No. 349; Panmure Royal Arch Chapter No. 723; Aldershot Camp Royal Arch Chapter No. 1331; Connaught Royal Arch Chapter No. 1971; William Stuart Preceptory No. 76; and Royal Military Rose Croix Chapter No. 89.

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An inquiry was held at Cuckfield on Wednesday week, by Mr. Herbert Law, M.I.C.E., an inspector from the Local Government Board, into the application by the rural district council to borrow £15,000 for works in connection with the water supply for the parishes of Ardingly, Balcombe, Bolney, Cuckfield rural, Lindfield, and Slaugham.

The Gloucester City Council received on Tuesday a report for the extension of the city boundaries in all directions, for which purpose nearly 7,000 acres of county territory would be annexed. The rateable value of the town would be increased from £180,000 to £225,000, and 7,500 persons would be added to the present population of 43,000. The council instructed the committee to prepare a further report with a view to an application being made to the Local Government Board.

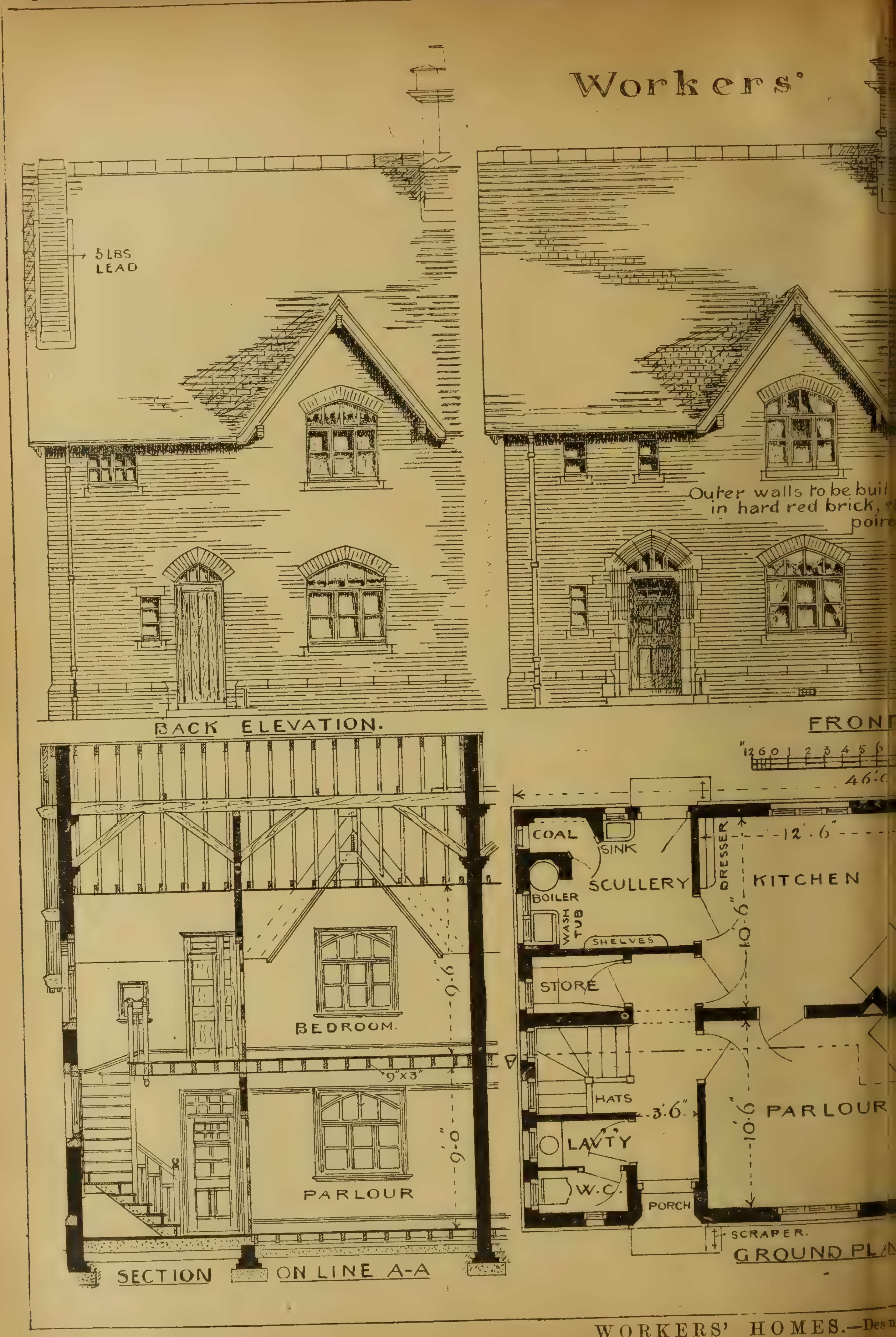
PROFESSIONAL AND TRADE SOCIETIES.

British Fire-Prevention Committee.—The arrangements of the British Fire-Prevention Committee for the winter session will again include a comprehensive series of fire-tests, to which it has also been decided to invite distinguished guests from abroad, the almost international interest accorded to the work having led to a number of applications from foreign officials, architects, and engineers to attend the experiments. In October there will be further investigations with doors of various materials, with floors, patented partitions, and non-inflammable materials. The operations of the testing-station will then probably be extended to experiments with automatic fire-alarms.

Glasgow Architectural Association.—At the opening meeting on the 22nd session of this association, held in the rooms, 187, Pitt-street, on the 19th inst., the president, Mr. John Fairweather, A.R.I.B.A., delivered the opening address on "The Association and its Work." Briefly reviewing the many changes which had taken place in the 21 years of its history, the president, while acknowledging the vast increase in the membership, had to complain of a proportionate decrease of interest taken in the association by its members, draughtsmen, craftsmen, and juniors—particularly the latter—the very class for whose benefit the association was originally instituted. He enumerated the many benefits to be derived from the association, both architectural and social, and pointed out that if each member would come forward, join hands with the committee, and do his utmost as an individual to further the aims of the association, there was no limit to the influence which it might effect as an educative body. At the conclusion of the address, Mr. Fairweather was accorded a hearty vote of thanks.

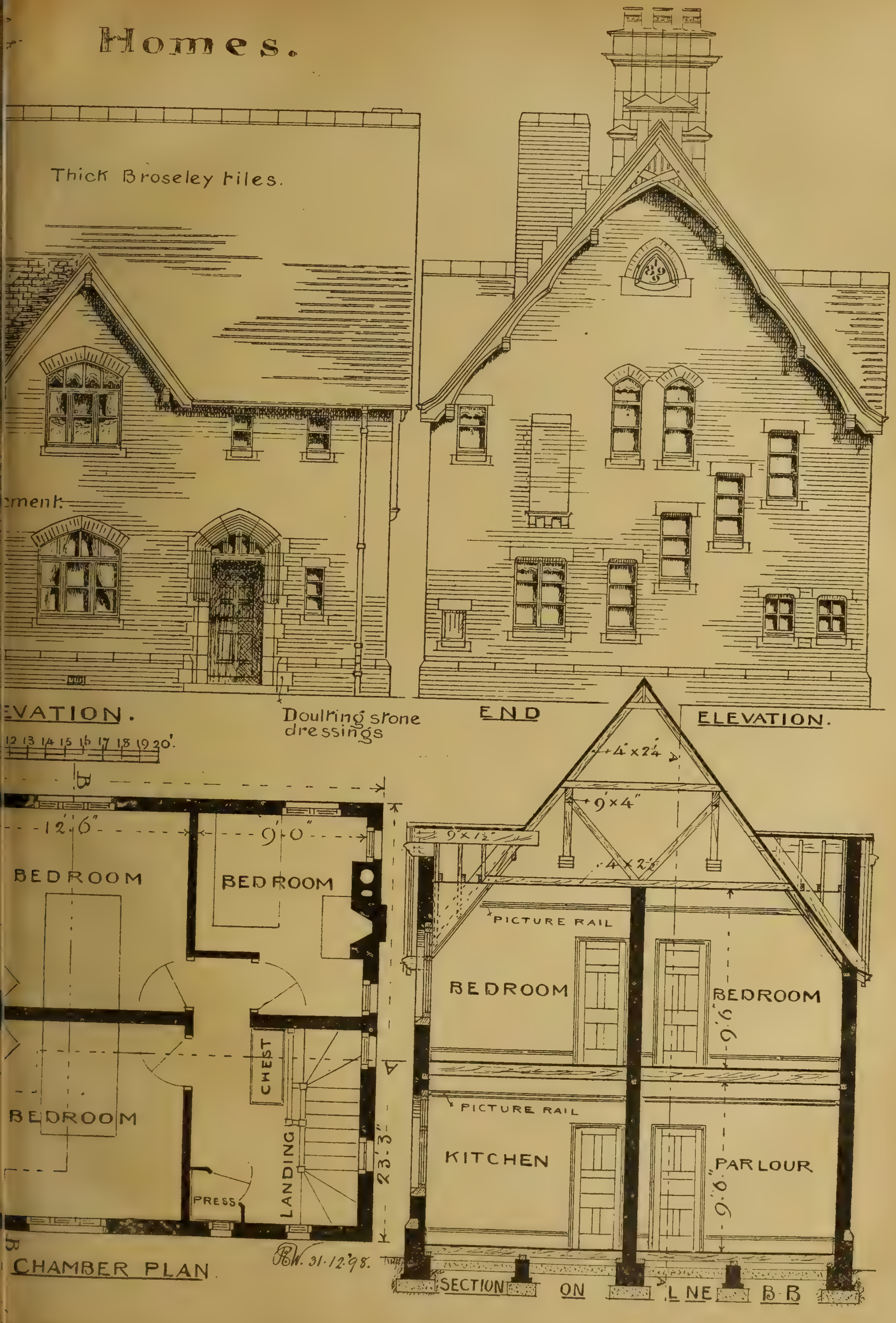
Northern Architectural Association.—On Saturday members of this association travelled from Newcastle to Sunderland for the purpose of inspecting several building of special interest to the profession. The first place visited was the Municipal Technical Education College. The memorial stone of the structure, which is situated near the Bishopwearmouth Church, was to be laid on the following Wednesday morning. The party, having examined the foundations of the college, proceeded to the Hudson Road Schools; and then to the new post-office, which is in course of construction in West Sunniside, and which has now reached ground-floor height. The party next took train for Southwick, where St. Columba's Church was examined. This building is Byzantine in style, thus forming in many ways a pronounced departure from the ordinary parish church. Externally, St. Columba's is severe and simple in the extreme, but its interior is characterised by dignity and beauty. Quite recently Mr. J. Eadie Reed painted a fresco, depicting "The Conversion of England," on the lower portion of the eastern apse, and this now forms one of the most striking features of the edifice. Having inspected this church, the party returned to Sunderland, where they were entertained to tea by Mr. F. Caws, vice-president of the association. Among those who took part in the afternoon's proceedings were Mr. W. Glover, Newcastle (president); Mr. J. W. Hanson, South Shields; Mr. J. Bruce, Mr. C. S. Errington, Mr. J. W. Taylor, and Mr. Arthur B. Plummer (hon. secretary), Newcastle; Mr. G. R. Boreham and Mr. F. Caws, Sunderland.

The Surveyors' Institution.—We understand that extensive preparations are being made for the entertainment of the members and their friends who will attend the conversazione to be given by the president, Mr. T. M. Rickman, on the occasion of the formal opening of the new house of the Institution at 12, Great George-street, Westminster. Besides vocal and instrumental music, there will be, in the various rooms, a cinematograph display, a demonstration of X-rays on the living subject, an interesting series of fluorescing tubes, an exhibit showing the gradual evolution of the now familiar incandescent lamp, a bacteriological collection by the Jenner Institute, a number of engravings from portraits by Vandyck, and a collection of Wedgewood ware which has been lent by a member. The Forestry Museum and the council-room will be used as refreshment-rooms. The president's reception will commence each evening at 9 o'clock.



WORKERS' HOMES.—Des

Homes.



Williams, F.R.I.B.A. (See page 395.)

LEGAL INTELLIGENCE.

What is a New Building?—At Bridgend Police Court on Saturday the Porthcawl Rural District Council proceeded against Mr. H. Kay, agent for the Hon. Ivor Guest, for infringement of the council's by-laws. There were four summonses, the offences alleged being that, contrary to the Public Health Act, 1875, and certain by-laws made thereunder, he proceeded to erect a building at Newton Court Farm without submitting proper plans; that he allowed the premises to be occupied before obtaining a certificate of the officer of the council, and that, having completed the premises, he failed to give notice to the council that he had done so in order that the surveyor might examine them. Mr. S. T. Evans, M.P., appeared in support of the information, and Mr. Parsons for the defendant. Mr. Evans, in opening, said that some time before December 16, 1898, a plan was sent in to the council. A letter was subsequently written to the architect, Mr. G. F. Lambert, stating that the plan had been rejected as it did not show a proper system of drainage. On February 14 the clerk wrote to Mr. Kay calling his attention to the fact that the work and additions to the house were being proceeded with in contravention of the by-laws, the plans not having been sanctioned. On the 15th February Mr. Kay wrote undertaking to do what was necessary, but no plan showing any of the drains was submitted, and on the 5th September a summons was issued. On the 6th September a very defective plan was sent in to the council. In the subsequent correspondence which took place the point was raised, on behalf of the defendant, that plans were not required to be submitted, as this was not a new building.—Mr. Parsons contended that the council had not taken proceedings within the time specified —viz., six months from the date of the offence—and under Jarvis's Act they were out of court.—Mr. Evans suggested that this was a continuing offence, but the clerk did not agree. After further argument, Mr. Evans said he feared the objection was a fatal one, and the summonses for allowing the house to be occupied without obtaining the certificate of an officer of the local authority was next gone into. Mr. Morgan Thomas, the surveyor to the council, gave evidence in support of the summons.—Mr. Evans: What you say is that the drain, so far as it has been laid, has been properly done, but that is not sufficient?—Yes.—Mr. Parsons submitted that there was no evidence of "letting or occupying," to use the words of the by-laws, a new building. The question was whether the slight alterations which had been carried out at this place constituted a "new building." In the case of an appeal from a decision of the Swansea Stipendiary upon a similar point, the late Lord Chief Justice held that the question whether a building was a new one or not was a matter of degree, and the magistrate had absolute discretion. All that had been done in this case was to build an additional bedroom, a box-room, and substitute a slate roof for a thatched one. After Mr. Kay had given evidence, Mr. S. T. Evans replied on the points of law; and said that this was more of a new building than that in respect of which the Swansea appeal was brought. The Chairman, interposing at this point, said: The majority of the magistrates are of opinion that this is not a new building. Mr. Evans: If you had only asked me if I had any other authority for my submission, as I have, I think it would have been better. I desire to quote the case of Meadows v. Taylor, and to ask you to state a case. The Bench agreed to state a case.

In Re A. C. Bedworth, of Handsworth.—The first meeting of the creditors was held on Friday at the offices of the Official Receiver, Birmingham. Liabilities £1,690; assets £57; deficiency £1,632.—In his observations, the Official Receiver stated that bankrupt, at the age of 22, commenced business in April, 1898, as a builder and contractor. He had previously been engaged in a situation with a cycle manufacturer. Being without capital, he borrowed £600 from his mother, who subsequently guaranteed a banking account to the extent of £250. She was now a creditor for £150. Bankrupt's first speculation was to build eight houses in Havelock-road, and the property was finished early this year. The mortgage amounted to £1,600, leaving an equity estimated at £400. In January the property was sold to the bankrupt's mother. Shortly after commencing business bankrupt assisted two tradesmen by signing accommodation bills. Payment was suspended, and debtor, in consequence, lost £467. In November last he became the lessee of land in Westminster-road, and commenced to build eight houses. The mortgagees and interest amounted to £1,330, whilst the bankrupt estimated that he had expended £1,750. He valued the property at the amount due to the mortgagees, and it was doubtful whether there would be any surplus. Bankrupt is a bachelor, and resides with his mother. The insolvency was attributed by bankrupt to loss on buildings, bad debts, and being surety for other people. Bankrupt was cross-examined at length by Mr. Woollett (assistant official receiver) and Mr. A. C. Jacques, who appeared for the petitioning creditor, especially as to various boxes of cigars he took with him, and gave, as he alleged, to strangers in August while travelling for health, and as to a diamond ring, horse and conveyance, all of which he asserted belonged to his mother. He had been in business fifteen months, and had made a deficiency of £1,632, or about £108 per month. He stayed at Bewdley with Mr. R. Crump, a builder, with whom he was associated in another enterprise. Mr. Woollett said the bankruptcy was a very unsatisfactory one, and the Official Receiver was dissatisfied with the bankrupt's explanations. The case is a summary one and the Official Receiver was appointed trustee.

Are Boulders "Rock"?—Mr. Charles Jackson, engineer, Manchester, the arbitrator appointed by the Court of Appeal, has published his award in the action of Braithwaite v. Ilkley District Council. The plaintiffs are contractors carrying on business in Leeds, and sued the defendants, the Ilkley District Council, for work done in connection with the new sewage works at Ben Rhydding. The point in dispute was whether the plaintiffs were entitled to be paid extra for the excavation and removal of blocks of stone or boulders, and also for certain alterations and deviations made in the contract. The defendants contended that though the plaintiffs were entitled to be paid extra for "rock," boulders of the kind described did not come within that term. They also denied that there had been any deviation. The case was heard on June 29, July 20 and 21 last. Mr. E. O. Simpson, solicitor, appeared for the plaintiffs, and Mr. W. J. Waugh, barrister, appeared for the defendants. The arbitrator has now found in favour of the plaintiffs' contention, and awards the sum of £616 7s. 7d., and directs the defendants to pay all the costs of the arbitration, and of all the previous proceedings in the High Court and Court of Appeal.

CHIPS.

At a meeting of the archdeacons and rural deans of the diocese of Truro, held on Saturday at Bodmin, under the presidency of the archdeacon of Bodmin, Mr. John M. Strong, of St. Stephen's-by-Launceston, was re-elected surveyor of ecclesiastical dilapidations for the Archdeaconry of Bodmin for a period of five years.

The fourth annual Church Congress Exhibition will be held under the auspices of the Clergy and Artists' Association at Leighton House, the residence of the late Lord Leighton, P.R.A., Holland Park-road, Kensington, from Monday till Friday, October 9 to 13. The Bishop of Rochester will preside over a general meeting of members to be held at Leighton House on Wednesday, October 11, at 5.30 p.m., when Mr. Holman Hunt will be present.

Mr. George Smale, of Launceston, was appointed surveyor and inspector of nuisances by the Okehampton District Council on Saturday, at a salary of £110 per annum.

At the last meeting of the Devon County Council, the asylum committee reported that the sanction of the Secretary of State had been obtained, though with considerable alterations and additions, involving fresh estimates, to the whole of the remaining plans for the extension of the asylum buildings. Mr. E. H. Harbottle, of Exeter, surveyor, explained that the Commissioners required these alterations to be made in accordance with the result of their recent deliberations, and had intimated that they could not reduce their stipulations. Plans for the new reservoir and the pumping machinery necessary for the supply of portable water to the enlarged asylum, the estimated cost being £7,909, were approved, and £1,150 was also voted for furnishing two new blocks for the reception of eighty-seven patients, which will be in readiness for occupation in a few weeks.

The Countess of Derby has consented to lay the foundation-stone of the new hospital of St. Mary in Gloucester-street, Oxford-street, Manchester, on Monday, October 9.

At Coventry last week the first sod for the railway which is to be constructed to connect the London and North-Western Company's Coventry and Nuneaton line with Messrs. Webster and Co.'s brickworks in Stoney Stanton-road was cut. The railway will be about a mile in length, and is estimated to cost between £10,000 and £12,000. The old works of Messrs. Seaman will be used as a goods depot by the London and North-Western and Midland Railway Companies. The engineer is Mr. W. E. Winby, C.E., and the contracting firm are Messrs. Cruwys and Horborough, of Gloucester.

Major-General Crozier, R.E., will hold an inquiry on behalf of the Local Government Board at Torquay to-day (Friday) respecting the application of the Corporation to borrow an additional £10,000 for electric-lighting purposes, and £1,500 for a shelter at the head of the Princess Pier, and so practically converting it to a pavilion.

A well-known firm of architects and engineers at Manchester have lodged with the building committee of the Bridlington Urban Council plans of an extensive scheme for the development of the Beaconfield estate, including a theatre for 2,000 persons, a hotel accommodating 200 guests, with an arcade beneath, and also a promenade pier and pavilion on the sea front.

A meeting of the housing of the working classes committee of the Bath Corporation was held on Friday, when the chairman (Mr. T. B. Silcock) mentioned that Mr. Fortune's scheme for clearing an unhealthy area in Lamparp's Buildings, and erecting new artisans' buildings, was estimated to cost £14,420, while the rent obtainable was estimated at £285. It was decided to have the report in detail considered at the next meeting.

A new parish-room was opened at Cullompton, Devon, on Friday. The hall is 45ft. by 22ft. 6in. It is constructed of brick, with open timber roof, wood dado, and block flooring. The work was executed by Messrs. Labdon and Sons, of Cullompton, from designs prepared by Mr. G. Warren, M.S.A., of Exeter, and under his superintendence and direction.

A new foundry is being erected at Leicester from the designs of Mr. William Langley, architect, of Leicester, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

The Arts and Crafts Exhibion, which will be opened at the New Gallery from the 9th prox. to the end of November, is to comprise a room entirely occupied by works of William Morris, who was president of the exhibiting society.

The Manchester Corporation are about to have erected two additional sets of public baths—one at High-street, Longholme, estimated to cost £20,000, and the other, on which only about £4,000 will be expended, in the suburban district of Bradford.

A carved oak font cover has been placed upon the old font at the south-west end of the parish church of Plympton, St. Maurice. It is in the 15-century style of Gothic art, wrought in Devon-grown oak, and put together by pins of the same material, no nails or screws of metal being used. The cover is the handiwork of Messrs. Harry Hems and Sons, Exeter, by whom it has been placed *in situ.*

On Thursday in last week (St. Matthew's Day), the church of St. Hildeburgh, at the corner of King's Gap and Stanley-road, Hoylake, was consecrated by the Bishop of Chester.

The great 15th-century church of Holy Trinity, Hull, in which gas lights have given way to electricity, and the organ entirely remodelled at considerable cost, will be reopened on October 5 by the Archbishop of York.

Several wall-paintings of great antiquarian interest have been discovered during the process of restoring the Early Norman Church of Ashmansworth, on the North Hampshire Hills, a few miles south of Highclere Park, the seat of Lord Carnarvon. The most ancient series of paintings probably dates from about the year 1200, and represents the descent of Our Lord into Hell. This painting is on the wall of the nave. Mr. Charles E. Keyser will report upon the discovery to the Society of Antiquarians.

Mr. John R. Rust, one of the earlier American railway engineers, died at his home in Brooklyn on Tuesday in last week. He was born at Wolfboro, N.H., 71 years ago, and spent most of his working life building railways in Northern New England and west of Chicago.

On Saturday afternoon memorial-stones were laid of a new place of worship which is being erected for the members of the United Free Church at Washwood Heath, near Birmingham. A new Sunday-school has been erected, and in front of it will be a church in the Modern Renaissance style, of red brick, with facings of grey terracotta. The church will seat 400, and will cost about £3,000. The church is being built by Mr. T. Johnson, from the designs of Messrs. Ingall and Son, of Birmingham.

At the last meeting of the Dean of Guild's Committee of Aberdeen Town Council, plans of new buildings representing a value of between £18,000 and £19,000 were sanctioned. The plans were mostly for dwelling-houses.

The old Wesleyan chapel in Hobson-street, Cambridge, was reopened last week after renovation and redecoration, carried out by Messrs. Miller and Son, of that town.

At the recent annual meeting of the registered plumbers in the counties of Aberdeen, Kincardine, and Banff, a resolution was carried expressing warm approval of the Plumbers' Registration Bill, and declaring that its passage through the Houses of Parliament "is essential to the continuance of the registration movement—a movement which, it is generally admitted, is rendering important services to the public health."

WATER SUPPLY AND SANITARY MATTERS.

Bo'ness, N.B.—A report by Mr. John D. Watson, C.E., Aberdeen, who was appointed by the Local Government Board to inquire into certain allegations made by Dr. Graham, Bo'ness, regarding the sanitary condition of the burgh, has been received. Mr. Watson states that, speaking generally, there is truth in the allegations made by Dr. Graham under the head of defective drains, traps, gutters, or pipes in the streets of Bo'ness, injurious or prejudiced to health, but undue importance should not be attached to this admission. In dealing with Bo'ness it should be borne in mind that the old part of the town is made up of irregular streets, lanes, and closes of old and often dilapidated houses of the poorest kind. The Local Authority are not less anxious to remedy the existing defects than the petitioner is, and they have during the last two years shown a praiseworthy determination to deal with a large insanitary area by the demolition of houses, and by forming new and regular streets on the ground thus set free. At present, sewers and drains are not sufficiently flushed, partially owing to scarcity of water. Under the statute the Local Authority are entitled to sell surplus water after fully supplying what is required for domestic and sanitary purposes, but in this case the Local Authority are reversing the order, inasmuch as they are selling upwards of one million gallons of water per week for trade purposes. Meantime certain improvements essential under any circumstances should be effected on the sewerage system in order to render the available supply as efficient as possible. The improvements suggested are stated in detail by Mr. Watson in his report.

Queensland Artesian Bores.—The Agent-General for Queensland has issued information as to the Colony, in which the following occurs:—The discovery of the artesian resources which underlie a greater part of the great expanse comprised in the Western plains has disclosed a new area to grazing in many parts of the Colony. The water-bearing strata are considered to mark the position of the ancient cretaceous sea which connected the Gulf of Carpentaria with the Great Australian Bight, and which divided the Australian continent into two islands. The successful bores hitherto sunk in Queensland may practically be said to find their source in the cavities of the porous sandstone of the lower cretaceous or rolling downs formation, which underlies the larger portion at least of the country found to the west of the palæozoic barrier of the great dividing range, the Cordillera, which separates the waters flowing to the east coast from those flowing to the west. This vast area, some 460,000 square miles, consists chiefly of undulating downs clothed in ordinary seasons with the richest pasture. There are 644 bores supplying water throughout Western Queensland, with an aggregate depth of 717,272ft., the maximum quantity from any one bore being 4,000,000 gallons daily.

CHIPS.

The sales at the Mart, Tokenhouse-yard, last week, as registered at the Estate Exchange, amounted to £21,555. The sum registered in the corresponding week of last year was £37,100.

New municipal buildings are in course of erection at Godmanchester for the town council. Mr. Allan Fordham is the architect, and Messrs. B. Thackray and Co. are the contractors.

An inquiry instituted by the Local Government Board was held on Sept. 21 at the offices of the Withington Urban District Council by Dr. Fletcher to consider the application of the council for authority to borrow the sum of £58,706 for the purpose of erecting an infectious diseases hospital at Baguley. Mr. Broadbent, the architect, exhibited and explained the plans.

A Local Government Board inquiry was held at Chipping Norton on Friday by Mr. C. Perrin, inspector, the corporation having applied for power to borrow £3,000 for a water extension scheme.

The Corporation of Glasgow discussed at their last meeting a report from the Water Committee as to the claim of Messrs. Morrison and Mason, Limited, for extras in connection with their contract for the Black Rig section of the new Loch Katrine aqueduct. The amount of the claim was £9,144. The claim was chiefly made up of charges for lining the walls and arches of the tunnels with 18in. instead of 12in. of concrete required by the specification. The work, admittedly a necessary one, was executed under verbal orders from Mr. Miller, the assistant engineer, during the absence, owing to illness, of Mr. Gale, the engineer-in-chief. The contractors now agreed to halve the whole amount claimed, which made the sum payable £4,572, and this offer the Works Committee recommended for acceptance. Eventually the corporation adopted the recommendation.

Our Office Table.

An important work is going on in the burial vaults beneath St. George's Chapel and the Albert Memorial Chapel at Windsor Castle. Here are deposited the remains of George III., George IV., William IV., the Duke of Kent, the Duke of York, Princes Octavius and Alfred, children of George III. (removed from Westminster Abbey), the Duchess of Brunswick, Princesses Adelaide and Elizabeth, children of the Duke of Clarence, Queen Charlotte, Princess Charlotte, Princess Amelia, Queen Adelaide, Princess Augusta, George V. (King of Hanover), and, lastly, the Duchess of Teck. Only the Queen and her family, and very occasionally a specially privileged visitor, are admitted to the burial vaults, which were constructed by George III. The vaulted roof is supported by massive octagonal columns, which also support ranges of stone shelves upon which the coffins are placed. There are also stone tables a foot high for the same purpose at the east end and in the centre. It has hitherto been necessary, in order to gain entrance, to remove heavy iron plates guarding the stone stairway to the vault. Lanterns have been required to enable the visitors to see.

At the entrance to the vault, which is at the east end of St. George's Chapel, an arched doorway is being put up, and in future the simple process of unlocking a door, and descending the stairs, will be all that is necessary. In place of hand-lanterns or candles electric lamps have been fitted, by which the vault can be instantly flooded with light. The coffins of George III. and his family, the Duke of Kent, the King of Hanover, the infant child, Victoria, of Princess Frederica of Hanover (Princess Von Pawel-Rammingen), and others, nearly twenty in all, have been moved from the large stone table, which runs down the centre of the vault, to the range of stone shelves by the side of the walls of the sepulchre. The only coffin which now remains on the table is that of the Duchess of Teck and this will shortly be moved to the side stone shelves. A marble altar is to be erected at the east end. These alterations are made by the Queen's authority, for the satisfaction of the Prince and Princess of Wales and other members of her Majesty's family. They are being executed under the personal direction of Mr. A. Y. Nutt, of the Office of Works, Messrs. Wheeler, of Reading, being the contractors.

We are glad to hear that the appeal made to Messrs. Boots to preserve the picturesque features of the 17th-century buildings in the Market Place at St. Alban's has been successful. In reply to the memorial drawn up by Mr. F. S. Kitton, and published in our issue of the 1st inst., p. 283, Messrs. Boot write:—"When we bought the old house in the Market-place, St. Alban's, we had no idea of the widespread interest attaching to it, and in the ordinary course would have replaced it with a first-class modern building, uniform with the other branches we own. We shall, however, have much pleasure, in deference to the wishes of those who have signed the memorial, and of others who have communicated with us direct, in instructing our architect to spare neither pains nor expense in maintaining the upper portion of the premises in its integrity, while making the ground floor a convenient and handsome modern place of business."

It is not generally known that the premises in Adam-street, Adelphi, which have been occupied by the Society of Arts since 1775, are not freehold. The original lease expired in 1867. It was renewed for a period of thirty years, which expired in 1897, and the lease was further renewed for a period of seven years, ending in 1904. The accommodation is now hardly sufficient for the needs of the society. It is especially deficient as regards the requirements of a library, and the want of convenient library accommodation has for many years past been a serious drawback. There is every reason to believe that with ampler premises the operations of the society might be extended, a greatly increased number of members attained, and consequently larger funds provided, which might be expended in objects of public usefulness. The society's meeting-room has been largely used by other societies, to whom it has been readily lent, and for public meetings for objects cognate to the work and purposes of the society.

One of the most promising proposals for rendering the Paris Exhibition of 1900 attractive is that of Chevalier Pesce, the architect of the Italian Embassy in Paris, who proposes to reconstitute Pompeii, as it existed before the stream of fire from Vesuvius had buried it from sight. M. Pesce proposes to restore to us the life of the forum, the camp, the gladiators, the Temple of Isis, the theatre bordering on the forum, the numerous shops and public baths, and all those houses, squares, and open spaces where formerly were concentrated the life, the activity, the pleasures, the celebrations and public spectacles which made this watering-place by the Mediterranean one of the most attractive spots in the Italian peninsula. No detail in the life of Pompeii known to archæology in the period before the disappearance of the ancient town seems likely to be neglected in this magical evocation. Numerous actors, in costumes archæologically accurate, will give to the city its former animation. The forum is to be crowded with a constantly moving throng. The arena will be given up to the gladiatorial combat. The lines of shops will offer the most varied products for sale. The charlatans and hawkers will scream their wares in the streets. Chariot wheels will follow the deep-dug ruts in the stone highways. The mysteries will be celebrated in the Temple of Isis, and orators will harangue the crowd in the public squares.

The Hon. Frederick Street writes to explain that the county council of Derbyshire, while desirous of maintaining the picturesque appearance of Swarkeston Bridge, have found on further investigation that it is impracticable to adopt any other mode of strengthening the bridge than that already begun, and to which we called attention in our issue of August 25, p. 250. There are at Swarkeston, he explains, altogether five Gothic "bridges" under the causeway or across the meadow, containing in all seventeen arches. Of these seventeen arches, two were repaired by means of brick arches many years ago, seven have been, or are being, lined with blue brick by the county council, two have not yet been touched, though it is proposed to line them in the same way, and six will be retained in their present form, as the work is not so much decayed as the others, and the stonework can be repaired. The actual bridge over the river needs no repair, and will be left alone.

A system of electric lighting and tramway traction was formally inaugurated at Plymouth on Friday. The undertaking has been carried out by the corporation, and it is noteworthy as the first in the kingdom to begin with combined lighting and tramway load. For lighting purposes about 21 miles of cables have been laid. The Hoe and principal thoroughfares are lighted by arc lamps, while the connections for private consumers equal about 8,000 eight-candle power lamps. One section of the municipal tramways, about a mile and a half in length, has been equipped for electric traction on the overhead system, and another section of similar length is to be taken in hand at once. The mayor (Alderman J. Pethick) formally started the works, and was presented as a memento on the occasion with a bronze figure holding an incandescent lamp. Mr. J. H. Rider, the electrical engineer, claimed that in Plymouth they were starting with the cheapest price ever charged at the beginning of an undertaking—nanely, 4½d. per unit for private consumers. The total load at the station, which was equivalent to nearly 17,000 eight-candle power lamps, was a record for any station in this country for a start.

The largest landslip which has yet occurred on the Midland Railway has just taken place on the Leicester and Rugby branch line in the Leire cutting. The cutting is a very long and deep one, the rail level being over 70ft. below the boundary fence; but the banks have given no trouble since the formation of the line 59 years ago. The south bank gave signs of shifting, and it was closely watched till it developed into an enormous slide over 330ft. long, above 70ft. deep, and very wide. Thousands of tons of glacial clay, which at this point rests on the top of a bed of free sand about 10ft. deep, bulged inwards, raising the rails, and threatening to stop communication altogether. Several hundred men were set to work, and, by working night and day, a single line has been kept open, the other one being closed to traffic. Up to Monday afternoon over 11,500 tons of blue lias clay had been removed, and more than three times that quantity still remained to be dealt with. The slip has been caused by the prolonged drought, which cracked the clay and thus allowed the subsequent heavy rainfall to penetrate the sandbed underneath. It will take at least another fortnight, working night and day, to repair the damage.

On Wednesday last Mr. W. E. Riley, late Assistant Director of Architectural and Engineering Works, was presented with an address and a service of silver by his friends in the Works Department of the Admiralty at home and abroad, as a mark of their regard on his leaving the Service to take up the appointment of superintending architect to the London County Council. The presentation was made by Lieut.-Col. E. Raban, R.E , Director of Works, who referred to Mr. Riley's length of service in the department (through all the grades of which he had passed), to the regret with which they all parted with him, but to the great satisfaction they all felt at his having been selected for his present high appointment, which reflected credit on the whole department. Mr. Riley expressed his feelings of regret at leaving the department in which he had served so long, and in which he had made so many friends. He was much touched at receiving this very handsome present, and at the kind expressions with which it was accompanied.

On Friday in next week the city of Manchester will be placed in possession of the celebrated Althorp Library, which was purchased in 1892 for a quarter of a million sterling from Earl Spencer by Mrs. Rylands, the widow of Mr. John Rylands, a Manchester millionaire, with the intention of presenting it to Manchester. Mrs. Rylands has also had built a library in Deansgate for the housing of the 80,000 volumes, which include the finest and most complete specimens in existence of the work of all the earliest printers. There are 50 Caxtons alone, and Bibles in all languages. The library, which goes to Manchester intact, includes the Valdarfer Boccaccio, which was sold in 1812 to the Duke of Marlborough of the day for £2,260, being £10 over the last bid of the Earl Spencer of that generation. The precious volume, however, ultimately came to the Althorp Library.

Large quantities of foreign cement are now being imported into the United Kingdom, including some of very poor quality, adulterated with slag. It is often sold to buyers as English cement, and bears the name of "Portland," often without any indication that it is made abroad. Some of the English makers have asked that the authorities should forbid the importation of this foreign cement until the bags bear a title or mark that will enable the consumer to know that the cement is made abroad. The matter concerns the trade, and the request seems a reasonable one, for at least the foreign article ought to be sold for what it is.

A meeting largely representative of the county of Dorset was held on Wednesday on the site of the recent discovery of Roman remains at Dorchester, the object being to initiate a movement for the acquisition of the fine specimen of Roman pavement in order that it may be preserved for the public. The visitors were received in a large marquee by Mr. Higgs, of Weymouth, upon whose land the pavement was unearthed, and who offered to sell the pavement to the county for £500, on condition that it was removed to the County Museum, or, alternatively, he was prepared to sell the pavement and the adjoining premises for £1,500. Mr. H. J. Moule, curator of the Dorset County Museum, and Dr. Colley-March, who has acted on behalf of the British Museum, explained the history of the pavement and the symbolism of the design. A general desire was expressed that the interesting relic should, if possible, be secured for the county, and it was understood that in the event of a fund being raised for this purpose the British Museum would not compete for its purchase. The liberal promises of support of the proposed fund made at the meeting indicates the probability that the pavement will be kept at Dorchester.

It was reported at a meeting of the Tramways Committee of the Manchester City Council on Tuesday that the Carriage and Tramways Company had offered liberal terms for a renewal of their present lease. In consideration of the lease being extended for ten years the company offer to pay the corporation in lieu of the existing rent of £23,334 a rent of £50,000 a year, and an annual sum of £4,000 for the maintenance and repair of the city lines. The committee declined the offer. A report has been prepared by the committee of the City Council setting forth in detail the various changes and extensions proposed to be made when the tramways come under the control of the corporation. It is suggested that early application be made to the Board of Trade for sanction to borrow £250,000 for the reconstruction of the permanent way.

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CHIPS.

General Samuel J. Field, of Buffalo, has been appointed chief engineer of the Pan-American Exposition at Buffalo; Mr. William S. Kissam, New York, supervising architect; Mr. Luther Steiringer, New York, advisory electrical expert; Colonel Wm. Richardson, of Buffalo, advisory member of the department of construction; chief of mechanical department, Henry Rustin, Omaha; chief draftsman, Henry Weatherwax, Omaha.

Mr. Fred Macdonald, who has been for many years prominently connected with bridge construction in the United States, died on September 3 of yellow fever, at Key West, Florida. He was born at Gananoque, Canada, about 50 years ago, and had been with both the Delaware Bridge Company and its successor, the present Union Bridge Company. Several years ago he went to Australia to take charge of the erection of the Hawkesbury Bridge, and, returning, travelled for a long time in Europe, Asia, and Africa. At the time of his death he was the superintendent of the coal dock which the company is erecting at Key West for the United States Government.

At a meeting of the Gladstone Memorial Committee at Blackburn, the mayor announced that Mr. Adams Acton, sculptor, had written stating that the statue would be completed and fixed ready for the unveiling ceremony by the Earl of Aberdeen by the first week in November. The fund now amounts to £2,154.

At St. Andrew's Church, East Allington, a font is about to be erected as a memorial to the late rector. It will be of marble and alabaster, set upon approaches of Devonshire marble, and will have a carved spiral oak cover. Messrs. Harry Hems and Sons, of Exeter, are the sculptors.

Caldey Island, Pembrokeshire, was the scene of an interesting ceremony on the 6th inst. Ever since the Rev. W. D. Bushell became the owner of the island, in 1897, he has interested himself in the restoration of the ancient chapel of the Priory, long since degraded to secular purposes. The Priory dates from the eleventh century. The part now brought back to its original use is the stone-vaulted chancel. Until recently it was used as a brewhouse. The walls and roof have now been stripped of successive coats of whitewash, and pointed, and a new altar has been erected where the boiler for brewing purposes stood; a cement dado encircles the chapel, and a new floor has been laid down. During the restoration the ancient piscina was uncovered. The service was one of reparation, followed by the dedication of the altar of St. Benedict.

Among the names in the lists of awards announced in connection with the West Australian section of the Greater Britain Exhibition is that of the Willesden Paper and Canvas Works, of Willesden Junction, whose exhibit has secured a diploma conferring a silver medal and jewel upon the Company.

The Earl of Jersey conducted an inquiry at the Nelson Town Hall on Monday with respect to a proposed light railway from Nelson to Barrowford. Mr. Prescott, town clerk of Nelson, in stating the case for the corporation, said it was proposed to construct three lengths of railway, one being six furlongs in extent and situated wholly in the borough of Nelson; the second railway was six furlongs 19 yards in extent, situated wholly in the urban district of Barrowford; whilst the third railway was a loop line.

At the church of St. Thomas of Canterbury, Lewes, on Sunday the Rev. C. L. Norris unveiled a mural painting representing St. Wilfrid, the patron saint of Sussex. The background represents the apse of an Early English church, and the light is concentrated on the upper portion of the figure of St. Wilfrid, who is depicted with the Primatial Cross in one hand, and the other raised in blessing. St. Wilfrid is clothed in chasuble and white alb, with a mitre of the period.

It is announced that Canon Rawnsley, vicar of Crosthwaite, Keswick, in response to a cordial invitation, left England on Monday for America, to deliver a promised course of lectures on "The National Trust for the Preservation of Places of Historic Interest and Natural Beauty," and "Literary Associations of the Lakes." Canon Rawnsley will visit New York, Brooklyn, Concord, Boston, Philadelphia, and Washington.

Sir J. T. Brunner, M.P., has presented to the Irish National Gallery at Dublin a portrait in oils by S. P. Hall of Charles Stewart Parnell.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Society of Engineers.—"Photographic Surveying." by J. Bridges Lee, M.A., F.G.S., Royal United Service Institution, Whitehall. 7.30 p.m.

Friday.—Architectural Association. Annual Meeting. Address by President, G. H. Fellowes Prynne, F.R.I.B.A., and Distribution of Prizes. 7.30 p.m.

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THE ARCHITECTURAL ASSOCIATION.

OCTOBER 6th.—ANNUAL GENERAL MEETING, at No. 9, Conduit-street, W., at 7.30 p.m. ADDRESS by the President, Mr. G. H. FELLOWES PRYNNE. Distribution of Prizes. Exhibition of Prize Drawings, &c.

The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, at 6.30 p.m. A Pamphlet, giving full information, may be obtained of the SECRETARY, at 56, Great Marlborough-street, W.

G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

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The city council of Bristol rejected on Tuesday a proposal to instruct the finance committee to consider and report as to the desirability of appointing a city architect.

The vicar of the parish church of Horndon-on-the-Hill, Essex, is endeavouring to restore that ancient building. The present church was built in the 13th century, but an earlier Saxon one existed on the same spot. The chancel and chapel were rebuilt in the 15th century. The nave had a clerestoried roof, which about two centuries later was covered up as it now is with lath and plaster, probably to strengthen or conceal the decaying timbers. The nave has four Early English bays, and some Norman columns.

The Local Government Board have sanctioned a loan to the urban district council of Morecambe of £1,215 towards the cost of a new road through Euston-grove to the West End and a bridge over the Midland Railway. This is the district council's contribution towards a scheme estimated to cost £10,000, the remainder being borne by the adjoining landowners and the Midland Company. The new road will be a great improvement, opening up the West-end without approaching the Marine-road, which has lately been impassable at times during high tides.

At the Liverpool Consistory Court, on Tuesday, Chancellor Espin declared that the vicars and wardens who had substituted electric lighting for gas in their churches without a faculty of the court had acted wrongfully, and he called upon the rural deans and archdeacons to see that the law was obeyed.

The Bishop of St. Asaph consecrated on Wednesday the new church of Brynmaen, Colwyn Bay, erected at a cost of £10,000 by Mrs. Frost, of Old Colwyn, in memory of her husband.

The New Tramways Committee of the Newcastle-on-Tyne City Council are now pushing forward their work with all speed, and an electric power station is to be forthwith erected in City-road. For this work Mr. B. F. Simpson, of Newcastle, has been appointed architect, and Mr. J. Savage as quantity surveyor.

A new Church of England soldiers' institute has been opened this week at Colchester. This institute has been built upon War Department land upon a good site opposite the main entrance to Napier Lines, and is in character with the new infantry barracks there. The building cost £1,100 to erect and equip.

The sub-committee of the health committee of the Bristol Corporation appointed to deal with the question of a municipal lodging-house met on Monday to inspect the plans for the building, and decided to recommend that they should be approved and forwarded to the Local Government Board in view of the application which is to be made to that body for sanction to borrow the money. The site selected is at the junction of Wade-street and River-street, and the cost of the land was £1,450, in addition to £112 for the purchase of a ground rent. The plans have been prepared by the city engineer, Mr. Yabbicom, and it is estimated that the cost of the building, which will contain 102 beds, will be £5,150, exclusive of furniture.

The services in connection with the sixth anniversary of the consecration of St. Matthew's Church, Kingsley-park, Northampton, which was erected by the Phipps family, began on Wednesday week, when the Bishop of Salisbury preached. On St. Matthew's Day there took place the benediction of nineteen stained-glass windows given by an anonymous donor to fill the series of openings in the north and south aisles. Below the several subjects, which are taken from the ministerial life of our Lord, are scrolls of ribbons inscribed with Scripture quotations bearing directly upon the subjects depicted. The canopy work is considerably varied. These windows are by the same artist as those in the side chapel—viz., Mr. H. A. Hymers, of Chelsea. The gifts also include a bishop's chair and two Glastonbury chairs for the sanctuary.

LIST OF COMPETITIONS OPEN.

Tunbridge Wells—Designs in Tunbridge Ware: Coloured (1) £3 3s., (2) £2 2s., (3) £1 1s.; Uncoloured (1) £2 2s., (2) £1 1s., (3) 10s. 6d. (Walter Crane, Assessor)	Technical Education Committee	The Town Clerk, Town Hall, Tunbridge Wells	Sept. 30
Paignton—Pavilion and Stand for 400 Persons (limit £800)	£15, £5	G. Barnston, Clerk, Town Hall, Paignton	Oct. 16
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	,, 17
Elland—Baths on South House Estate	No first; £20, £10	The Clerk, U.D. Council Offices, Elland	,, 28
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	Nov. 30
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—
Leicester—Workhouse Infirmary (360 patients) and Imbeciles' Home (150 patients)	£100, £50, £25	The Clerk to Board of Guardians, Leicester	—

LIST OF TENDERS OPEN.

BUILDINGS.

Kendal—Villa	Richard Thornburrow	John Thompson, A.R.I.B.A., Architect, 1, Finkle-street, Kendal	Sept. 30
Heywood—Stables, Cart Sheds, Mortuary, &c., Hind-hill	Corporation	J. Ainsworth Settle, Borough Engineer, Municipal Bldgs., Heywood	,, 30
Arundel—Billiard-rooms &c., at the Victoria Institute		Wheeler and Lodge, Architects, Horsham	,, 30
Rawtenstall—Eight Cottages on Hall Carr Estate		George Parkinson, Contractor, Rawtenstall, Lancs	,, 30
Lochboisdale—Additions to Castlebay School	Barra School Board	J. Hill, Banker, Lochboisdale, Scotland	,, 30
Sampford Peverell—Butter Factory		R. S. Norrish, Fordlands, Tiverton	,, 30
King's Lynn—Workshop and Stores at Gayton Waterworks	Waterworks Committee	H. J. Weaver, C.E., Town Hall, King's Lynn	,, 30
Clara Vale—Thirty-Six Cottages	The Stella Coal Co.	The Colliery Office, Clara Vale, Ryton-on-Tyne	,, 30
Hallwill and Beaworthy—Cottage Hospital		C. F. A. Voysey, Architect, 6, Carlton Hill, London, N.W.	,, 30
Pontefract—House and Outbuildings, Ackworth-road	J. E. Poppleton	Tennant and Bagley, Architects, Ropergate, Pontefract	,, 30
Cardiff—Branch Library at Grangetown	Corporation	E. M. Bruce Vaughan, Architect, St. Mary-street, Cardiff	,, 30
Sampford Peverell—Additions to Merrimeade House		R. S. Norrish, Fordlands, Tiverton	,, 30
Bodmin—Additions to Town Arms Hotel	Walter Hicks	T. H. Andrew, Architect, 1, Trevarrick-villas, St. Austell	,, 30
Cymmau—Alterations at C.M. Chapel		William Lewis, Cymmau, Wales	Oct. 2
Erith, Kent—Central Schools (1,260), West-street	School Board	W. Egerton, Architect, 12, Queen's-road, Erith, Kent	,, 2
Burton-upon-Trent—Additions to Mosley Cottages	Corporation	George T. Lynam, Boro' Engineer, Town Hall, Burton-upon-Trent.	,, 2
Sowerby Bridge—Nine Houses		Medley Hall, Architect, 29, Northgate, Halifax	,, 2
Luton—Engine House and Engine Foundations	Waterworks Company	J. Taylor, Sons, & Santo Crimp, 27, Great George-st., Westminster	,, 2
Hastings—Stabling, Loose Boxes, &c., at Rock-a-Nore	Corporation	P. H. Palmer, Borough Engineer, Town Hall, Hastings	,, 2
Barnstaple—Alterations to North Devon Infirmary		F. W. Petter, A.R.I.B.A., Hon. Surveyor, Barnstaple	,, 2
Culoville—Two Cottages	Gt. Northern (Ireland) Railway Co.	The Co.'s Engineer-in-Chief, Amiens-street Terminus, Dublin	,, 2
Idle—Classrooms at Thorpe Board School	School Board	W. and J. B. Bailey, Architects, 9, Market-street, Bradford	,, 2
Fulwood—Outbuildings, &c., at Wrigan House Farm	Preston Union Guardians	J. Whitwell, Engineer, Fulwood Workhouse, Preston	,, 2
Coventry—Roofing Cemetery Chapel, &c., London-road	Corporation	J. E. Swindlehurst, C.E., City Eng., St. Mary's Hall, Coventry	,, 2
Sowerby Bridge—Nine Houses		Medley Hall, Architect, 29, Northgate, Halifax	,, 2
Handsworth, Staffs—Stabling, &c.	Urban District Council	E. Kenworthy, A.M.I.C.E., Council House, Handsworth, Staffs	,, 2
Colwall—Station Buildings and Verandahs	Great Western Railway Co.	The Company's Engineer, Gloucester Station	,, 3
Armagh—Offices at Workhouse	Guardians	W. Calvert, Clerk, Workhouse, Armagh	,, 3
Cleckheaton—Stable and Carriage-House at Hospital	North Bierley Joint Hospital Board	G. R. Ross, 41, Mannville-terrace, off Morley-street, Bradford	,, 3
London, W.—Station, Notting Hill and Ladbroke-grove	Gt. Western & Metrop. Jt. Railways	The Engineer, Paddington Station, W.	,, 3
Basingstoke—Fifteen Cottages, Flaxfield-road	Working Classes Committee	George Fitton, Borough Surveyor, Town Hall, Basingstoke	,, 3
Omagh—Spires to Church	Very Rev. Monsignor M'Namee	W. Hague, Architect, 50, Dawson-street, Dublin	,, 3
Manchester—Joiners' Shop, Jackson's-row	Town Hall Committee	The City Surveyor's Office, Town Hall, Manchester	,, 3
Burnham Beeches—Cottage	Great Western Railway Co.	The Company's Engineer, Paddington Station, W.	,, 3
Sunderland—Additions to Three Crowns Hotel	R. Fenwick and Co., Ltd.	G. Gordon Hoskins, F.R.I.B.A., Architect, Darlington	,, 3
Lewes—Extension of County Hall	East Sussex County Council	F. J. Wood, County Surveyor, County Hall, Lewes	,, 3
Didcot—Thirty Cottages	Great Western Railway Co.	The Company's Engineer, Reading Station	,, 3
York—Refuse Destructor Buildings	Corporation	A. Creer, City Engineer, Guildhall, Yorks	,, 3
Rothes—Two Houses		10, Seafield-square, Rothes, N.B.	,, 4
Bucknall—Enlargement of Classroom	School Board	Arthur E. Applewhite, Clerk, Bucknall, Lincoln	,, 4
Hampton—Four Cottages at Sewage-Disposal Works	Urban District Council	John Kemp, A.M.I.C.E., Surveyor, Hampton	,, 4
Edinburgh—Parson's Green Public School	School Board	Robert Wilson, Architect, 3, Queen-street, Edinburgh	,, 4
Tollerton—Station Buildings	North-Eastern Railway Co.	William Bell, the Company's Architect, York	,, 4
York—Open Bath near Acomb Landing	Sanitary Committee	A. Creer, City Engineer, Guildhall, Yorks	,, 4
Hastings—Chimney Shaft (100ft. high) near Brede Bridge	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	,, 5
Minworth—Infants' School	Lea Marston U.D. School Board	Francis Towler, Clerk, 185, Vauxhall-road, Birmingham	,, 5
Laytown—Coastguard Station		The Office of Public Works, Dublin	,, 5
Hoddesdon—Lodge, Chapel, Entrance Gates, &c., at Cemetery.	Burial Board	The Clerk's Office, Hoddesdon, Herts	,, 5
Northallerton—Stores	Tarpaulin and Linoleum Co., Ltd.	J. M. Bottomley, Architect, 28, Albert-road, Middlesbrough	,, 5
Sheffield—Infectious Diseases Hospital at Lodge Moor	Corporation	Flockton, Gibbs, & Flockton, Archts., St. James's-row, Sheffield	,, 5
Dewsbury—Rebuilding the Black Bull Inn, Market-place	J. Tetley and Son, Ltd.	F. W. Ridgway, F.R.I.B.A., Bond-street, Dewsbury	,, 5
Hastings—Alterations to Electric Light Works	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	,, 5
Dublin—Additions to the National Gallery		T. N. Deane and Sons, Architects, 3, Upper Merrion-street, Dublin	,,
Celbridge—Four Cottages, Leixlip	Rural District Council	L. A. McDonnell, Architect, 33, Kildare-street, Dublin	,,
Ynysybwl, Wales—Cookery Classroom at Trerobart School	Llanwonno School Board	Arthur O. Evans, Architect, Pontypridd	,, 6
Worksop—Alterations to Station	Great Central Railway Co.	The Engineer's Office, London-road Station, Manchester	,, 6
Sale—Lodge, &c., at Recreation Ground	Urban District Council	A. G. M'Blath, A.M.I.C.E., 2, Montagu-road, Sale	,, 7
Whitchurch—Repairs at Vicarage and Glebe		The Vicarage, Whitchurch, Devon	,, 7
Cardiff—Roath Branch Library	Corporation	Teather and Wilson, Architects, Queen-street, Cardiff	,, 7
Horsham—Additions to 7A, North-street		C. H. Burstow, F.I.A.S., Architect, 6, West-street, Horsham	,, 7
Ballinasloe—Slating and Plastering Work (Three Years)	District Asylum Committee	J. Young, Asylum Clerk, Ballinasloe, Ireland	,, 7
Stainland—Three Houses, Dog-lane		C. F. L. Horsfall and Son, Archts., Lord-st. Chambers, Halifax	,, 7
Burnley—Extension of Workhouse	Guardians	S. Keighley, Architect, Nicholas-street, Burnley	,, 9
Pentre—Additions to Cwmclydach Board School	Ystradyfodwg School Board	Jacob Rees, Architect, Hillside Cottage, Pentre	,, 9
Yardsley—Public Offices, &c., Stratford-road, Sparkhill	Rural District Council	Arthur Harrison, Architect, 88, Colmore-road, Birmingham	,, 9
Crook—Minister's Residence	Primitive Methodist Society	F. H. Livesey, Architect, N.E. Bank Chambers, Bishop Auckland	,, 9
Birkenhead—Electricity Generating Station, New Chester-road	Corporation	Chas. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	,, 10
Dublin—Central Bridewell and Offices, Chancery-street		H. Williams, Secretary, Office of Public Works, Dublin	,, 10
West Kensington—Post-Office Savings Bank	H.M. Commissioners of Works	J. Tanner, H.M. Office of Works, Storey's Gate, S.W.	,, 10
Barking—Greenhouse at Recreation-Ground	Urban District Council	C. J. Dawson, F.R.I.B.A., Public Offices, Barking	,, 10
strad—Pavilion Blocks, Boundary Walls, &c.	Rhondda Urban District Council	W. D. Morgan, Architect, 23, St. Mary-street, Cardiff	,, 10
ortslade—Engine and Boiler Houses, &c., at Pumping Station	Brighton Town Council	Francis J. Tillstone, Town Clerk, Town Hall, Brighton	,, 10
lland—Engine-Room, Chimney, &c., at Cross Mill		W. Clement Williams, Architect, 29, Southgate, Halifax	,, 11
ondon, N.E.—Extension of Hackney Public Baths	Hackney Vestry	Gordon, Lowther, and Gunton, Architects, Bloomsfield-street, E.C.	,, 11
ishop Sutton—Infant School		Maynard Froud, Architect, 1, St. Stephen's-street, Bristol	,, 11
ooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	,, 11
evonport—Parochial Offices at Camel's Head	Guardians of the Poor	H. G. Luff, Architect, 64, Chapel-street, Devonport	,, 11
shton-in-Makerfield—Additions to Offices, Bryn-street	Urban District Council	J. W. Liversedge, Surveyor, Council Offices, Ashton-in-Makerfield	,, 11
outh Normanton—Girls' School	School Board	R. C. and E. R. Sutton, Architects, Angel-row, Nottingham	,, 12
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	,, 12
kerton—St. Joseph's Church		The Rev. P. O'Bryen, Slyne-road, Skerton, Lancaster	,, 13
eicester—Cemetery Buildings on Gilroes Estate, Groby-road	Corporation	Goddard and Co., Architects, 6, Market-street, Leicester	,, 13
ootham—New Gymnasium Wing, &c., at Friends' Boys' School		W. H. Thorpe, F.R.I.B.A., Architect, 61, Albion-street, Leeds	,, 14
ootham—Science Block, &c., at Friends' Boys' School		W. H. Thorpe, F.R.I.B.A., Architect, 61, Albion-street, Leeds	,, 14
imbledon—Ten Workmen's Dwellings, Dwinsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, The Broadway, Wimbledon	,, 16
ingswood Hill—Engine-House at Pumping Station	West Gloucestershire Water Co.	E. D. Marten, M.I.C.E., The Birches, Codsall, Wolverhampton	,, 16
uthwark, S.E.—Additions to Workhouse, Parish-street	St. Olaves Union Guardians	Newman and Newman, Architects, Tooley-street, S.E.	,, 17
eworth—New Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 18
entford—Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 18
omford—Isolation Wards, Administration Block, &c.	Joint Hospital Board	W. Whitmore, Architect, 17, Duke-street, Chelmsford	,, 24
est Brompton—Additions to Infirmary, Fulham-road	St. George's Union Guardians	E. T. Hall, F.R.I.B.A., Architect, 57, Moorgate-street, E.C.	Nov. 7
orecambe—Bank Premises	Bank of Liverpool, Ltd.	Cressey & Keighley, Archts., Bank Chmbrs, Euston-rd., Morecambe	—
ntypool—Shop, George-street		Bevan and Co., Ltd., Furnishers, Pontypool	—
adford—House in Nab Wood		H. and E. Marten, Architects, 5 and 7, Charles-street, Bradford	—
ng Eaton—Laundry Buildings	Long Eaton & Dist. Steam Laundry	Frederick Ball, Architect, 23, King-street, Nottingham	—
acton-on-Sea—Additions to Royal Hotel		A. Sykes, 45, Finsbury-pavement, London, E.C.	—
rk Michael—Restoration of Parish Church Organ		The Secretary of Committee, Kirk Michael, Isle of Man	—
ncaster—House and Buildings at Grammar School	Trustees	R. and W. Dixon, Architects, Barnsley	—
rnet, Herts—Houses on Willenhall Park Estate		G. D. Martin, Architect, 8, Pall Mall East, S.W.	—
rlington—Two Houses, Kensington-street		G. C. Gymble, Architect, Parkinson's Chambers, Bradford	—

BUILDINGS—*continued.*

Newport, Mon.—Mineral Water Factory & Stores, Mountjoy-rd.	William Hancock and Co., Ltd.	Watkins and Brown, Architects, 156, Dock-street, Newport, Mon	—
Banavie—Additions to Hotel		Cameron and Burnett, Architects, Academy Buildings, Inverness	—
Keighley—House and Shop, North-street		John Judson and Moore, Architects, York Chambers, Keighley	—
Southwold—Cottage		J. Doddington, New Inn, Yoxford, Suffolk	—
Northampton—Factory, St. James's-end	A. E. Marlow	Mosley and Anderson, Twentieth Century Chambers, Northampton	—
Cartmel—Alterations to Grammar School		Settle and Farmer, Architects, Ulverston	—
Burgate—Residence		Fred Bath, F.R.I.B.A., F.S.I., Architect, Salisbury	—
Menston—Additions to Residences		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—
Coxlodge—One Hundred Cottages	Burradon and Coxlodge Coal Co.	The Coxlodge Colliery Offices, Gosforth	—
Kendal—Nine Houses, Burnside-road		John Hutton, M.S.I., Architect, Kendal	—
Benton—Villa Residence		John W. Dyson, Architect, 67, Grey-street, Newcastle	—
Chell, Staffs—Workhouse Laundry & Lavatory Accommodation	Wolstanton & Burslem U. Guardians	W. H. Walley, Architect, Queen-street, Burslem	—
Hunslet—Alteration of Maltkiln into Warehouse		John B. Leak, Architect, Waterloo-road, Hunslet	—
Featherstone—Two Houses, Featherstone-lane	Arthur Day	W. Hamilton, Fearnley, Architect, Featherstone	—
London, E.C.—Plastering Work		"Builder," c/o R. A. Knight and Co., 12, Abchurch-lane, E.C.	—
Clay Cross—Twelve Cottages	Clay Cross Co.	W. M. Ashmore, Architect, New Queen-street, Chesterfield	—
Hornsea, East Yorks—Additions to Rolston Hall		Brodrick, Lowther, and Walker, Architects, 77, Lowgate, Hull	—
Abergavenny—Rebuilding 9, Cross-street	G. W. Shackleton	B. J. Francis, Architect, Abergavenny	—
Graffham—Additions to Foresters' Arms		Alfred Pursley, Graffham, Suffolk	—
Hereford—Alterations to Property, Commercial-street	Thos. Corner	W. W. Robinson, Architect, Hereford	—
Billesley—Farmhouse		G. H. Hinton, Architect, 11, Church-street, Stratford-on-Avon	—
Little Lever—New Nob Inn	Chadwick's Walmersley Brewery Co.	D. Hardman, Architect, Silver-street, Bury	—
Brighouse—Rebuilding the Grove Inn, Elland-road		J. Lane Fox, Bond-street, Dewsbury	—
Stone—One Hundred Cottages	Co-operative Land Society, Ltd.	The Society's Offices, 14 and 15, Coleman-street, E.C.	—
Wyke—Stabling for the Red Lion Inn		J. Lane Fox, Architect, Bond-street, Dewsbury	—
North Shields—Rising Sun Inn	Tyne Improvement Commission	W. H. Knowles, F.S.A., 37, Grainger-street, Newcastle	—
Loughborough—Converting Dormitory into Ward		W. T. Hampton, F.S.I., Architect, Swan-street, Loughborough	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Isle of Walney—Two Hundred Workmen's Dwellings	Vicars, Sons, and Martin	The Isle of Walney Estates Co., Ltd., Walney	—
Poole—Two Cottages, Stable, Coach-House, &c.		F. Butler, Carriage Works, Poole	—
Northbourne—Repairs to Church		The Rector or Churchwardens, Northbourne, Deal	—
Stockton—Rebuilding 71, High-street	S. S. Eades	T. W. T. Richardson, Architect, 57, High-street, Stockton	—
Ashton-under-Lyne—Houses (17 to 40)		Samuel Lomas, 5, Stockport-road, Ashton-under-Lyne	—
Prestatyn—Villa		Burton & Percival, Archts., 150A, Stamford-st., Ashton-u -Lyne	—
Barry—New Buildings off Park-crescent	W. J. Rogers, Ltd.	J. P. Jones, Richards, and Budgen, Archts, 18, St. Mary-st., Cardiff	—
Rawtenstall—House, Warehouse, and Stable at Holme Bank		John Taylor, 6, Ormerod-street, Rawtenstall, Lancs	—
Bexley Heath—Six Tenement Houses		Hawkins & Edgecombe, Architects, 22, Henrietta-st., Covent Garden	—
Lochmaddy—School and Teachers' House at Kylis Flodda	South Uist School Board	A. MacElfrish, Clerk, Lochmaddy	—

ENGINEERING.

Seaford—Extension of Outfall Pipe	Urban District Council	W. H. Pawson, Clerk, 3, Clinton-place, Sleaford	Sept. 30
Winwick—Electric Generating Plant	Committee of Visitors	J. P. Muspratt, Clerk, County Offices, Preston	" 30
Macroom—Sinking Well, &c.	Rural District Council	J. T. Murphy, Clerk, Macroom, Ireland	" 30
Handsworth—Gas-Engines and Pumps	Urban District Council	E. Kenworthy, A.M.I.C.E., Council House, Handsworth, Staffs	" 30
Wigton—Laying Water Main (240 yards of $\frac{3}{4}$in.)	Rural District Council	Wm. Brown, Surveyor, Wigton	" 30
Nottingham—Laying 30in. and 24in. Pipes ($19\frac{3}{4}$ miles)	Water Committee	The General Manager, Water Dept., St. Peter's-sq., Nottingham	" 30
Langley Moor—Purification Tanks and Drainage Works	Brandon and Byshottles U.D.C.	R. Gardner, Surveyor, Langley Moor, near Durham	" 30
Dundee—Electric Tramway Cars (20)	Town Council	Walter H. Tittensor, Elec. Eng., Dudhope-crescent-road, Dundee	" 30
Westbury—Reservoirs, Pumping Station, and Well	Westbury & Whorwellsdown R.D.C.	W. H. Stanley, A.M.I C.E., Market House Chambers, Trowbridge	Oct. 2
Cromer—Pier, Sea-Walls, Parades, Slips, &c.	Commissioners	Douglass and Arnott, Engnrs., 15, Victoria-st., Westminster, S.W.	" 2
Newtownstewart—Steel Overline Footbridge at Station	Great Northern (Ireland) Rly. Co.	The Company's Engineer-in-Chief, Amiens-street Terminus, Dublin	" 2
Bagillt—Driving Holywell-Halkyn Tunnel		The Engineer, Dee Bank, Bagillt	" 2
Huddersfield—Five Lancashire Steam-Boilers	Corporation	A. B. Mountain, Engineer, St. Andrew's-road, Huddersfield	" 2
Cromer—Steel and Iron Pier (500ft.)	Commissioners	Douglass and Arnott, Engnrs., 15, Victoria-st., Westminster, S.W.	" 2
Blackpool and Kirkham—Railway	L. & Y. & L. & N.W. Joint Rlwys.	R. C. Irwin, Hunt's Bank, Manchester	" 3
Barrow-in-Furness—Boiler, &c., for Heating School		W. Hutchinson, Clerk, School Board Office, Barrow-in-Furness	" 3
Sligo—Heating and Ventilating District Lunatic Asylum	Committee of Management	Sir T. N. Deane and Son, Architects, 3, Upper Merrion-st., Dublin.	" 3
Basingstoke—Water-Main (1,600 yards of 3in.)	Water Supply Committee	George Fitton, Waterworks Manager, Town Hall, Basingstoke	" 3
Blackpool—Widening Railway, Blackpool Central to South Shore	L. & Y. & L. & N.W. Joint Rlwys.	R. C. Irwin, Hunt's Bank, Manchester	" 3
Dunkarry, Clenor, and Liscarroll—Sinking Wells	Mallow Rural District Council	Maurice Regan, Clerk, Mallow	" 4
Northfield—Branch Railway (1 mile)		The Northfield Coal Company, Ltd., Scotland	" 4
Doneraile—Waterworks	Mallow Rural District Council	Maurice Regan, Clerk, Mallow	" 4
Blakestown, near Leixlip—Pump Well and Pump	Celbridge Rural District Council	L. A. Macdonnell, Architect, Celbridge	" 6
West Bridgford—Septic Tanks and Filter Beds	Urban District Council	Wm. Pare, George-road, West Bridgford	" 6
Blackpool—Extension of Steamboat Jetty	Pier Company	Jas. Walker, Secretary, Old Bank Chambers, Talbot-sq , Blackpool	" 6
Donadea—Pump Well and Pump at The Range	Celbridge Rural District Council	L. A. Macdonnell, Architect, Celbridge	" 6
Cloghroe, Knockraha, Coolymurraghue, and Kerry Pike—Sinking Wells and Erecting Pumps	Cork District Council	John Cotter, Clerk, Board Room, Workhouse, Cork	" 7
Hatfield—Widening Two Bridges at Mill Green	Hertfordshire County Council	The County Surveyor's Office, 41, Parliament-st., Westminster, S.W.	" 7
Bridgwater—Laying Water-Mains (3,125 yards), Stoneware Pipes (170 yards), &c.	Rural District Council	W. J. Press, C.E., Town Hall, Burnham, Somerset	" 7
Whitehaven—Dredging Works	Harbour Commissioners	Ernest E. Stiven, Harbour Engineer, Harbour Office, Whitehaven	" 7
Swansea—Engines, Generators, &c.	Corporation	Kincaid, Waller, and Manville, Engs., 29, Great George-st., S.W.	" 9
Rotherham—Lancashire Boilers, Engines, Dynamos, Pumps, &c.	Corporation	H. H. Hickmott, Town Clerk, Rotherham	" 9
Hendon, N.W.—Bacteria Bed (800 yds.), Sewage Outfall Works	Urban District Council	S. Slater Grimley, Engineer, Public Offices, Hendon	" 9
Birkenhead—Salt-Water Storage Tanks and Filter	Corporation	Chas. Brownridge, A.M.I.C.E., Town Hall, Birkenhead	" 9
Aberavon—Esplanade, &c.	Earl of Jersey	T. Williams, Estate Office, Briton Ferry	" 9
Tynemouth—Reservoir (3,000,000 gallons) at Moorhouses	Corporation	The Borough Surveyor, Howard-street, North Shields	" 9
Rotherham—Storage Battery, Switchboards, &c.	Corporation	H. H. Hickmott, Town Clerk, Rotherham	" 9
Glasgow—Three Electric Travelling Cranes, Constructional Steelwork for Power Station, and Laying Cables	Corporation	John Young, General Manager, 88, Renfield-street, Glasgow	" 10
Wapping, E.—Alteration of Swinging Gear	London County Council	The Engineer's Department, County Hall, Spring-gardens, S.W.	" 10
Londonderry—Killea Waterworks Extension	Council	J. J. S. Barnhill, C.E., 1A, Strand, Londonderry	" 10
Glasgow—Reconstructing Tramways	Corporation	John Young, Gen. Manager, 88, Renfield-street, Glasgow	" 10
Manchester—Passenger Elevator for Victoria Buildings	Improvements Committee	The City Surveyor, Town Hall, Manchester	" 11
Warminster—Laying Cast-Iron Pipes (1,200 yards of 8in.)	Urban District Council	A. F. Long, Town Engineer, Warminster	" 11
Kennington-road, S E.—Alterations to Machinery at Baths	Lambeth Vestry	John Buley, Consulting Engineer, 5, Laurence Pountney-lane, E.C.	" 12
Milford—Sinking Well and Erecting Pump at Carrowkeel	Rural District Council	S. Watters, Clerk, The Workhouse, Milford, Ireland	" 14
Tiflis—Tramways	Town Council	The Managing Dept., Town Council, Tiflis, Transcaucasus	" 14
Warrington—Two Sets of Steam-Engines	Corporation	James Deas, C.E., M.I.M.E , Bank House, Warrington	" 14
Purton—Waterworks	Cricklade & Wootton Bassett R.D.C.	F. Redman, Engineer, Newport-street, Swindon	" 18
Leeds—Fifty Electric Tramcars	City Council	Thomas Hewson, M.I.C.E., City Eng., Muncipal Buildings, Leeds	" 18
Luton—Electric Lighting Plant	Town Council	Albion T. Snell, Engineer, Suffolk House, Cannon-street, E.C.	" 22
Barking—Light Railway Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen-street-place, London, E.C	" 24
Port Elizabeth to Humansdorp, Capetown—Railway (70 miles)		The General Manager of Railways, Capetown	" 30
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	Nov. 3
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Colonial Secretary, Colombo	Jan. 4
Kintbury—Rebuilding Bridge on Newbury-road	Hungerford Rural District Council.	Chas. Calvert, Surveyor, Hungerford	—
Tralee—Swing-Bridge over Canal Waterway	Harbour Commissioners	G. A. E. Hickson, C.E., 25, Denny-street, Tralee	—
Driffield—Gas-Scrubber (40ft. by 7ft.)	Urban District Council	Henry Tobey, Malton, Yorks	—
Manchester—Three Boilers for Warming Town-Hall	Town Hall Committee	J. Rison, Town Hall, Manchester	—
Normanby—Laying 4in. Cast-Iron Pipes (1 mile)		The Normanby Brick Company, Ltd., Normanby	—
Driffield—New Gas-Mains (870 yards)	Urban District Council	G. B. Tonge, Clerk, Driffield	—
Ilford—Portable Steel Crane (3-ton)	Gas Co.	The Engineer's Office, Gasworks, Ilford	—
Uddington—Electric Lighting Plant		J. Watson, Builder, Uddinston, Scotland	—

FENCING AND WALLS.

Horsham—Iron Gates and Fencing	Burial District Joint Committee	Roger Henwood, Clerk, 17, London-road, Horsham	Sept. 3
Dartmouth—Boundary Walls near the Avenue	Corporation	T. O. Veale, Surveyor, Dartmouth	" 3
Edmonton, N.—Unclimbable Iron Fencing (360 lengths, 9ft.)	Urban District Council	G. Eedes Eachus, Engineer, Town Hall, Lower Edmonton, N.	Oct.
Idle—Fence Walling (225 lineal yards)	Urban District Council	The Surveyor, Public Offices, Idle, Yorks	"
Londonderry—Walls and Gate Piers, Brooke Park	Brooke Trustees	M. A. Robinson, C.E., M.R.I.A.I., Richmond-street, Londonderry	"
Sunbury-on-Thames—W.I. Fencing (1,300ft.) for Cemetery	Urban District Council	Harold F. Coales, Surveyor, Sunbury-on-Thames	"
Handsworth—Retaining Walls, &c.	Urban District Council	E. Kenworthy, M.I.C.E., Council House, Handsworth, Staffs	"
Manchester—Post and Rail Fencing (2,000 yards)	Corporation	G. Plant, Supt. Cleansing Dept., Town Hall, Manchester	"
Leytonstone—Cleft Oak Fence at Forest House	West Ham Union Guardians	F. E. Hilleary, Clerk, Union-road, Leytonstone	"
Hastings—Repairing and Painting Gates and Fence, Pilot Field	Guardians	A. R. Inskipp, Clerk, 11, Wellington-square, Hastings	"
Kinsale—Boundary Wall, Piers, Gates, &c.	Rural District Council	R. Evans, C.E., 53, South Mall, Cork	"
Leeds—Boundary Walls Round Harehills House		J. W. Thackeray, A.S.I., Architect, 14, Infirmary-street, Leeds	—

FURNITURE AND FITTINGS.

Halifax—Office Furniture for Police Station		G. Buckley and Son, Architects, Tower Chambers, Halifax	Oct.
Ennistymon—Twenty Iron Bedsteads, &c.	Guardians	John O'Loghlin, Clerk, Ennistymon, Ireland	"
Weston-super-Mare—Shopfront, &c., in the Boulevard		Hans F. Price, Architect, Waterloo-street, Weston-super-Mare	"
Enniskillen—Fixing a Table in County Council Chamber		The Office of Secretary to County Council, Enniskillen	"

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QUALITY IN BUILDINGS.

THE tendency to shallowness which characterises the present age in its reading and pursuits is seen also in the lack of honesty, suitability, and good workmanship of our buildings and their fittings. We observe this superficiality and shallowness when we compare the work of a former age with our own. Our architecture has developed much during the century which is now drawing to a close; we have studied superficially almost every epoch of art, Greek, Roman, Italian Renaissance, the Gothic of France and England, the Tudor and Stuart periods, Queen Anne, besides Oriental styles. Our industrial art has risen by leaps and bounds, and yet in many ways we are obliged to confess to the shallowness of our knowledge and the want of depth in our studies. When we compare, for instance, the early buildings of the nineteenth century with those of the present day, we remark a great difference in many things. Those buildings were no doubt heavy and commonplace in style, in strict keeping with the more solid literature and tastes of the day; but in their minor appointments and details we observe a sobriety and solidity of character. There was nothing showy in their iron grates and chimneypieces; the window sashes and doors were substantially made and fitted closely their rebates and pulley-stiles, their mouldings were bold and effective, and contrast favourably with our poor machine-made planted mouldings, and the furniture and ironmongery were plain and substantial. There was a desire to build houses substantially that should last for many generations; that every fitting, whether a door-hinge, a fastening, or a door-handle, should be durable and strong; but the same motives that prevailed then are not in vogue now. "Sufficient for the day," or for the short tenure, is now the watchword with our builders and manufacturers. The principle is to produce something that is cheap, not lasting; for durability is not now one of the objects of the maker. The quicker the article is worn out, the better for trade. The shoddy article must at least be showy;—it must sell; it must captivate the small builder and tenant.

The demand for quality is not so great as it used to be. The keenness of competition encouraged by speculative building is chiefly the cause of the falling off of good and sound fittings. Cost and quality are not synonymous terms. No one knows this better than the architect who has to specify materials and fittings. The "best quality" timber, for example, would add considerably to the cost of an ordinary building—not that the so-called "best" quality turns out the best, or the most efficient for its purpose. The adjective has but a relative value. An inferior brand is often put in its place, and sometimes with equal results. For many purposes seasoned Swedish deals are quite as good as Petersburg or Christiania,—often better, as being more uniform and straight-grained. Quality, therefore, is not always insured by high price, and quite as reliable joinery may be got out of deals at a reasonable price per St. Petersburg standard as if they had cost the highest price in the market. So it is with other trades in building. The trade catalogue and the price-list, things unknown in the earlier years of the century, are evidence of the competing spirit of the age. It is a class of trade literature that has increased greatly during the last two or three decades. Large firms and houses of business spend huge sums in the production of illustrated catalogues of "artistic" furniture, builders' ironmongery and metal-work, decorative fabrics, tiles, and materials generally. Some of these are really artistic productions; the designs and illustrations are worthy of the enterprise of the manufacturer and the art expert. These publications of the manufacturer and art craftsman are indications of the commercial groove in which art is running. Let us take up a few of these illustrated trade books. One is devoted to furniture; we see imitations of Tudor and Stuart and Georgian cabinets, tables and chairs; there are Chippendale and Heppelwhite and Sheraton styles, each priced according to the amount of labour or degree of finish in them. Cheap reproductions of these styles are made that will not last ten years. It is clear that these manufactured specimens of so-called "Sheraton," "Heppelwhite," or "Chippendale" have been repeated for years. The pieces are all got out to a pattern or by machinery and put together in the roughest and flimsiest manner, whereas the original artists who designed and executed these choice examples of furniture did so as craftsmen imbued with the honesty and purpose of their art, and achieved fame, not as dealers, but as makers. Speaking of decorative woodwork, where do we now find the honestly framed or clamped woodwork with mouldings worked in the solid? Or the box or coffer of clamped woodwork decorated by foliated and flowering ironwork? Or that very effective kind of wood frame, which consists of incising or cutting the wood into a series of butter-print patterns, the flat surfaces of the wood relieved by geometrical squares and circles, and then cutting out the spaces by scoopings, the angles being relieved by ornamental stopped-chamferings, a class of incising practised in Norway and Iceland as well as in Italy. This was a rational and inexpensive way of decorating plain deal or oak. The pattern was drawn by intersections of circles and squares with the compasses, and anyone who could use a chisel could do the relief. It could, in short, be done by the carpenter, for it was not real carving. Why cannot our manufacturers invent an effective yet cheap kind of wood decoration, instead of that miserable repetition of scrolls and rococo-work that one sees in modern furniture? Have they not the beautiful Italian *cassoni* to show them what can be done by simple incising with a common knife, with dots of colour; by introducing repoussé or pierced plates of metal, leather, and stamped relief.

Then we have the builder's ironmonger, whose catalogues show every kind of fittings, from hinges, rim, and mortise locks and latches, to door-furniture, and sash-fastenings. These are generally prolific in illustrations; the designs are in most cases repeats of forms that have done service for years, not always the best, but the easiest to execute. The rim and mortise locks are marvellous pieces of modern mechanism, chiefly made by machinery, and admirable for finish and workmanship; but we sometimes wonder whether they could not be improved in design. We have a preference for the rim lock: its projecting case of metal admits of some treatment. Its edges can be moulded, and its front plate embossed or chased, and made visible instead of being hidden in the substance of the door; but the fashion of the day has ordered differently, and has set its affections on the mortise-lock. We at least expect to find some art instinct exhibited in our door-handles and knobs, in the brass finger-plates and escutcheons of our doors, and even in the hinges, which might be made visible by ornamental foliated work, instead of being put out of sight and let into the edges of our doors and jamb-linings. We admit there is much improvement shown in the designs of our leading makers. To take only door-handles and finger-plates. These are now cast fluted, moulded, or reeded; we have seen brass reeded and *repoussé* plates that are really artistic productions. But the price and the quality come in. These are according to the material and the kind of decoration. For example, in finger-plates, what an assortment for the architect to select from; plates of wood and china, white, black, and cream and gold, brass, *repoussé*, embossed, reeded, or chased; there is plain and polished brass, there are finger-plates of cut glass representing crystal or amber. The price varies according to the material and pattern, the most expensive being the most elaborate in design and finish. The architect looking only for quality and good design finds it not: he is bewildered by a succession of elaborate and florid designs, and he selects a pattern; but there may be two or three "qualities"—there is the article of "common," "medium," and "extra quality" or strength. Perhaps the "medium" quality is specified, but the contractor puts in the ordinary quality. Just as if all these useful fittings should not be all of equal strength. Is there not a lesson to learn by this classification of commercial art to suit our pockets? The humblest dwelling—that occupied by the workman, his wife, and children—in which the wear and tear is naturally the greatest, gets the flimsiest door-knob and latch because it is the cheapest. What a comment on our commercial morality, that the articles with the largest sale and with the greatest profit are the worst and the commonest, so that the smaller buildings and houses suffer! When will industrial art awaken to a better and higher sense? Adaptability and strength are the leading requirements of the commonest as well as the most costly art. They ought to be everywhere obtained. It is as easy to turn a well-shaped door-knob as it is a bad one. A well-designed article like a lock or a finger-plate or a fire-grate ought not to cost more than one of those common articles which are now sold for the purpose; in short, the design of any article, if it be honest and true, ought not to add to the cost of production one halfpenny; but the modern maker of such articles caters for a public craving for decoration and ornament; to do this and to get a profit the design is disregarded, so long as the material can be cast or embossed or moulded at the lowest cost. The decorator of our buildings falls into the same mistake: he is induced to give what is most asked for, and he produces a showy design instead of that which is true and effective.

To take the miscellaneous fittings and articles which make up the ordinary building, those in which the Joiner, the Ironmonger and Smith, and the Decorator in his various departments have an interest. Can we say that the art quality bears any constant relation to the cost? The factors that go to make up the cost are uncertain; they are not those which commend themselves to the architect. Are they not often costly machinery and plant, laborious workmanship, elaborate design, fine execution, redundant ornamentation? These are not the factors which produce the most satisfactory design. Unfortunately, the most expensive manufactures are often the least honest and truthful. If it is a grille, or a wrought-iron screen or gate, it is an exaggerated copy of some old work perhaps twice the size or more. In an area of a foot is squeezed the pattern, the scrolls, bosses, and rivetings of the original of four or nine square feet, or it is a copy in brass of an iron grille. The modern manufacturer likes to force upon his patron or the public the evidence of cost; the work, whatever it is, must be elaborate, or showy, or obtrusive in its ornament, and he argues if the least expensive is plain, the costly must be elaborate and full of detail. With him plainness is equivalent to cheapness and want of skill. The price of the article is the gauge of its ornament or richness. Here, then, is the fallacy with regard to cost. More work is put in the highest-priced article. But what kind of work? It is not thoughtful labour, but quantity. When it is considered that the best design is often the simplest, and costs no more than a senseless repetition of ornament, ought we not to look for a better condition? The old builders invariably expended their best art over the simplest objects as well as the most costly and pretentious; their strongest and best fittings would have been placed in commonest and humblest houses; but it seems to be the irony of modern industrial and commercial art that the weakest and least durable products are placed in the buildings in which there is the greatest wear and tear; but such is the subversion of reason and commonsense caused by competition in art.

ESTIMATES.—XXIV.

IRONMONGERY, LOCKS, FASTENINGS, ETC.

PERHAPS there is more diversity in locks than in any other description of builders' ironmongery, both in make and quality. Architects are not particular enough in selecting these articles; they often say nothing about their design or quality. The best plan is to obtain of a good firm of lock-makers an estimate for providing these articles; or at least to give the numbers and prices of the locks required. The prices vary greatly; one may obtain a common rim-lock as low as 10d., with brass furniture, escutcheon roses, &c., complete—a class of goods that will do for a speculative builder of cheap houses, but we can hardly expect any wear from them. If we look at any good trade-list, such as that of Messrs. James Hill and Co., Young and Marten, or Colledge and Bridgen, Wolverhampton, &c., we shall see that rim locks may be had from 11s. per dozen to 100s. per dozen. A common but strong two-bolt 6in. rim-lock, double-bushed, can be had for 13s. per dozen; with brass bolt, extra strong, at 23s. per dozen; and these prices include screws. In ordering locks, plates, latches, handles, &c., as well as hinges and fasteners of various kinds, "right" and "left" hands should be given, and it may be mentioned that a "right hand" for a lock or latch would not be the same for hinges, which would be the reverse "left-hand." A "right-hand handle" and lock plates would describe the left side of the door as we approach it, a left-hand handle would be the one on the inside. For casement bolts, a "right-hand and left-hand inside" describes casements hung on the right and left respectively.

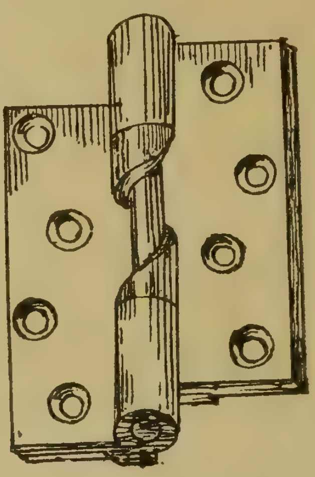
Mortise locks vary from about 1s. 9d. to 7s. or more for ordinary purposes. Furniture is not included, and this varies from about 6s. per dozen sets for brass, to white and black china door furniture costing about 13s. 6d. per dozen sets. China mortise and gold furniture, with ornamental brass rose and good spindle costs from about 20s. to 30s. per dozen sets. For these items we refer the student to Young and Marten's catalogue, or James Hill and Co.'s catalogue—a study of either of which will repay attention. A provisional price for sets of furniture is the best course, as so much depends on design, &c. It is only necessary to add for fixing, say, 4d. to 6d., and profit.

The "reversible" rim and mortise locks made by Hill and Co. give no trouble about "hands," in which four hands can be obtained in one lock; the keyhole is never upside-down. The full rebated mortise locks secure the bolts, which cannot be forced, as they are protected by the rebate. In describing these locks, state whether "right" or "left-hand," and the depth of rebate. A 6in. rebated mortise lock, with brass bolt, gunmetal, bushed, &c., and two levers for a ½in. rebate will cost about 12s. 6d. each.

When doors have two different kinds of furniture on each side, it is best to take locks and furniture separately, and describe each side as half set;—the locks in this case are described as without furniture. For special locks, such as those with wrought-iron mountings and stock locks, it is better to provide a sum.

Our illustrations give a few examples of locks and hinges. No. 1 is a steel joint rising butt of polished brass, 4½in. by 3½in., priced at 13s. to 15s. per pair. No. 2 is a wrought-iron garnet hinge, 18in. long, price about 13s. or 14s. per dozen pair. No. 3 is a patent reversible rim lock with brass bolts. No. 4 is a Hill's reversible patent mortise lock, priced at from 4s. 9d. to 5s. 9d. each. No. 5 is a stock or plate lock with perforated mounts. No. 6 a brass moulded and reeded door knob, priced at from 48s. to 60s. per dozen.

1



2

MORTISE LOCKS, ETC.—(Continued).

No. 6. 6in. Hill's patent reversible mortise locks, No. 53 R, with two brass bolts and two levers.

These are quoted in list at 5s. 6d. each.

	£	s.	d.
Cost of lock	0	5	6
Fixing at ·252	0	2	1¼
Screws, say	0	0	1
	0	7	8¼
Profit 10 per cent.	0	0	10
	0	8	6¼

For master key suites add 1s. extra per lock. (See sketch 4.)

No. 2. Hill's special 6in. "Villa" mortise lock, with two brass bolts and flat bow key, No. 85 R.

	£	s.	d.
Price of lock	0	3	6
Screws	0	0	1
Fixing	0	1	6
	0	5	1
Profit	0	0	6
	0	5	7

No. 1. 6in. steel case mortise lock, two levers, Scotch spring, full bushed, complete.

This is a special lock, and its price may be put down at 4s. 6d. each; fixing, &c., say, 1s. 6d., or 6s.

A good average quality mortise lock costs about 3s., and the fixing may be put at the above figure for a number.

No. 6. Dozen two-bolt, ornamental, 6in. cast-case rim locks, with screws for fixing; with two lever brass bolts.

These, as manufactured by Colledge and Bridgen, are priced at 36s. per dozen, or 3s. each, including fixing, say 9d.

1 Ditto. Hill's reversible rim-lock, two brass bolts, &c. (see sketch 3).

This is priced at 33s. per dozen, say 3s. each.

No. 1. Double-hand, patent-rim, 6in. lock, No. Y 2,004 in Young and Marten's catalogue.

This patent rim lock is priced at 25s. 6d. per dozen, without furniture.

No. 1. Ornamental rim-lock, steel case, 6in. iron bolts, brass bushed.

As there is only one, this may be worth 3s., though in some manufacturers' lists the price is 27s. per dozen. Add for fixing and profit, 10d.

No. 4. 7in. Two-lever brass-bolt dead lock.

These can be obtained at 72s. per dozen, or 6s. each.

No. 2. Young and Marten's "special cast-case, four-way, rim lock," nickel-plated key, with best furniture, drilled through, No. Y 1894.

These are superior locks, and are priced in list 36s. for iron bolts, and 42s. for brass bolts, per dozen. Fixing may be at ·095 = 9½d. each.

No. 14. 3in. cupboard locks fixed complete.

These are of various prices, and can be had from 2s. 6d. per dozen to 7s. 6d. per dozen.

	£	s.	d.
Cost of locks per dozen, say	0	4	10
Fixing at 8d. each, per dozen	0	8	0
Screws, &c.	0	1	0
Per dozen	0	13	10

This is a low price for strong japanned locks. For superior work we may put the locks down at 5d. each, screws, escutcheon, and pins at 2d., and fixing at 9d. = 1s. 4d., say 1s. 6d. including profit.

No. 6, 4in. ditto.

Add another 3d.; say, 1s. 9d. each.

No. 8. 6in. rim locks and brass furniture.

These would probably be for bedroom doors.

	£	s.	d.
Cost of lock, say	0	2	6
Screws to face-plate, pins, &c.	0	0	1
Fixing at ·095	0	0	9½
	0	3	4½

Say, 3s. 8d. including profit.

DRAWBACK LOCKS.

No. 2. Wood-stock lock, 9in.

These vary in price from about 2s. 6d. each to 7s. each. The latter would have ornamental oak case varnished, with ornamental wrought-iron mountings and Gothic key.

No. 2. 9in. drawback lock, japanned, fine ward.

These locks are to be had at 57s. per dozen, or about 4s. 9d. each. Add for screws and fixing, say, 1s. 6d.

No. 1. 7in. drawback lock.

A fair price is about 2s. 6d. to 3s. for a single lock; the screws, escutcheon, and staple are included. The fixing may be put at about 1s.

No. 1. Stock or plate lock 10in., with perforated straps at end, varnished, &c., as shown. (See sketch 5.)

A stock-lock of this description varies in price. One lock would be worth about 8s. 6d. each. They are priced as low as 33s. per dozen in one list.

DOOR FURNITURE.

No. 10. Sets of brass furniture for mortise locks.

These are purchased as low as 6d. a set.

	£	s.	d.
Say we put down a set	0	2	0
Fixing, say	0	0	3
	0	2	3

Or 2s. 6d. including profit.

Young and Marten sell a good set of 6in. brass rim furniture, drilled through, at 8s. 3d. per dozen sets.

No. 3. Sets of Mace's superior brass furniture for mortise locks, stamped roses for 6in. locks.

These are priced at 18s. to 27s. per dozen sets.

No. 2. Sets stamped reeded brass furniture (Wilkes' spindle) for 6in. mortise locks.

If of the best description we may price these at 4s. per set. A trade-list gives 45s. per dozen sets. (See sketch 6.)

No. 2. Sets of reeded china mortise furniture, cream and black, with brass roses and patent spindles.

These may be priced at 20s. to 24s. per dozen sets, say, 1s. 9d. to 2s. per set.

SASH FASTENINGS.

No. 16. Best brass spring sash fasteners.

The price of these fastenings ranges from about 6d. to 1s. 8d. each. A good ordinary strong brass fastener with china knob can be purchased at the rate of 7s. 6d. per dozen, or 7½d. each.

	£	s.	d.
Cost of sash fastening, say	0	0	7½
Screws	0	0	0¾
Fixing	0	0	4
	0	1	0¼

No. 4. Young and Marten's special cast brass fasteners, with Queen Anne knob, extra strong.

	£	s.	d.
This is priced in list at 9s. per doz., say..	0	0	9
Screws	0	0	0¾
Fixing	0	0	4
	0	1	1¾

Or for a small quantity like this it would be safer to say 1s. 6d. to 2s. each with reeded brass knob.

No. 6. Solid quadrant 3in. brass sash fasteners, polished.

These are worth 24s. per dozen, or 2s. each.

No. 2. Cog-action brass fasteners 3in., with reeded knobs and angle-plate.

These are priced from 30s. to 35s. per dozen, say 3s. each; add for fixing 4d., screws 1d.

CASEMENT FASTENERS AND STAYS.

No. 18. Malleable-iron casement fasteners (right hand).

These vary in price from 8s. to 24s. per dozen. A very good square-handle Cockspur fastener is priced at 12s. per dozen; if with reeded handle 21s. per dozen.

In Hill and Son's list a very good pattern, with fluted handle, is quoted at 24s. per dozen. (No. 2,825.)

No. 6. Polished-brass casement fasteners, with hooks and plates. (See sketch.)

Put these down at about 3s. each.

No. 2. Hill's polished-brass extra strong and finished fasteners. (No. 2,691,)

This is quoted at 3s. 9d. each in list.

No. 4. Polished gunmetal casement fasteners. These cost about 6d. more each. (See Hill and Co.'s catalogue.)

No. 4.—Strong brass Cockspur fasteners (4in.) and fixing (right hand).

These may be put down at from 30s. to 40s. per dozen, or, say, 3s. to 4s. each.

No. 18. Malleable-iron casement stays and fixing, 15in. long, japanned finish.

Price from 14s. to 50s. per dozen, according to finish and strength; fixing and screws, say 4½d. each. They vary much in design.

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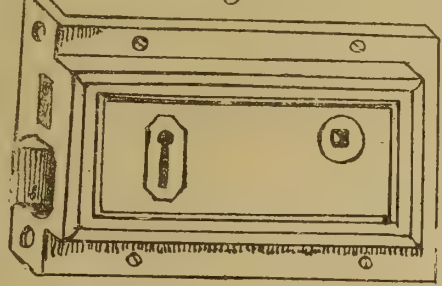

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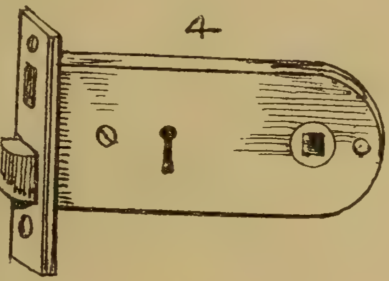

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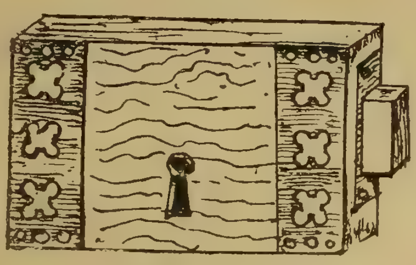

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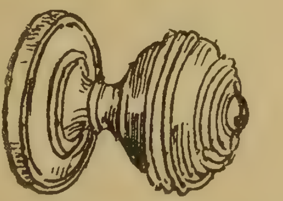

No. 8. Ditto 12in. long, ditto.

These cost 8s. per dozen, or say 1s. each.

No. 6. Pairs Hill's (Queen Victoria-street) ornamental iron-hinge fronts, No. 877.

Price 11s. per pair.

No. 2. Pairs wrought-iron strap hinges, 18in. long, of 2in. by ⅜in. iron and plates fixed with screws.

An 18in. pair of hinges of this size would weigh about 8lb., and at 39s. per cwt. would be about 5s. Add for fixing and screws 10s.

No. 2. Pair Collinge's 48in. spherical hinges, with bolts, complete.

These cost from 18s. to 24s. per pair, according to quality. The best quality has a hardened steel ball-bearing and turned cup, fitted with loose oil screw.

	£	s.	d.
Cost of hinges, per pair	1	2	0
Bolts and fixing, say	0	8	0
	1	10	0
Profit	0	3	0
Per pair	1	13	0

Provide for five pairs of wrought-iron hinges and bolts £20, and allow for packing, carriage, fixing, and profit. The latter items will vary, say, 20 per cent. in addition to price.

No. 6. Pair wrought-iron cross-garnet hinges of heavy quality, 18in. long, and fixing.

The prices quoted for these vary. Laxton has 2s. per pair. The weight for a pair of garnet hinges 18in. long will be about 4¾lb., and if we price at 6d. per pound, the cost will be 2s. 4½d. per pair.

	£	s.	d.
Cost, say	0	2	0
Fixing, &c., say	0	1	0
Per pair	0	3	0

Japanned cross-garnets of ordinary kind may be had at 10s. 6d. per dozen pair.

No. 20. Pair wrought back flaps 2in. wide.

These are worth about 10d. per pair. Added to fixing and screws, say, 4d.; 1s. 2d.

No. 12. Pair wrought-steel 2in. back flaps.

These are priced at 19s. per gross pairs.

No. 4. Strong Norfolk latches japanned.

The price varies from about 3s. to 8s. per dozen, say 6d. each, and fixing 2d. each.

PHOTOGRAPHIC SURVEYING.

AT a meeting of the Society of Engineers held at the Royal United Service Institution, Whitehall, on Monday evening, a paper was read by Mr. J. Bridges Lee, M.A., on "Photographic Surveying." In introducing his subject the author referred to the early history and literature of phototopography, and to some of the most important surveys effected with the aid of photographs. He then enunciated the chief causes which had impeded the progress of metrophotography as applied to surveying in this and other countries. The author then proceeded to criticise and dispose of these hindrances, which he showed no longer existed. He then set out in detail the special advantages of the photographic method. Amongst these advantages are: (1) A more complete and accurate record than can be obtained by any other means; (2) saving of time in the field; (3) ability to take full advantage of short clear interludes in unsettled weather; (4) special advantages for military purposes in an enemy's country; (5) utility for travellers rapidly traversing a country; (6) usefulness in detecting geological and physiographical changes; (7) economy in operation. The author then passed in review the various kinds of photo-topographic apparatus which had been designed and constructed, pointing out the distinctive features of most of the best known instruments. He stated that spherical projection had been proposed on account of its theoretical advantages; but he pointed out that it had never been brought into use in consequence of practical difficulties. Cylindrical projection had also been proposed and tried, with the result that, while fairly satisfactory panoramic views had been obtained, cylindrical projection had not been found suitable in practice for serious survey work. He observed that all the best photographic survey work everywhere had been done with plane projection instruments. It was pointed out that the instruments used for photographic surveying might be exceedingly simple, consisting of nothing more than a good fixed focus box camera and lens, with levelling screws and levels and marks inside the box to indicate the termination of the horizon and principal vertical lines. The Canadian surveys, which the author said were among the best, had been effected by the aid of very simple instruments supplemented by theodolites carried separately. On the other hand, instruments might be very complex, like most of the Continental forms, which were really phototheodolites, the camera and theodolite being combined in one instrument. It was pointed out that nearly all photosurveying instruments were designed to be used with the optic axis always horizontal, the Italian military instrument and Koppe's being exceptions to the general rule. The author then explained that until he introduced his improvements in photogrametric apparatus all such instruments, without exception, whether simple or complex, yielded nothing but ordinary photographs, with marginal marks to indicate the termination of the principal vertical and horizontal lines, which had to be ruled in afterwards by hand. The author then proceeded to describe the improvements made by him, and which were designed to facilitate the subsequent interpretation of the photographs. Those improvements consist of certain mechanical appliances inside the camera for securing an automatic record on the face of every picture taken of the horizon and principal vertical lines; of the compass bearing of the optic axis or principal plane; of a scale of horizontal angles applicable to all points visible in the picture; and of memoranda of useful information relating to the particular picture. The author then described the method of conducting a photographic survey and of plotting maps from survey photographs.

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THE SOCIETY OF ARCHITECTS.

THE SUBSCRIPTION TO BE RAISED.

An extraordinary general meeting of the Society of Architects was held at St. James's Hall, Piccadilly, W., on Thursday evening in last week for the purpose of considering a proposal to raise the annual subscription from one guinea to two guineas. Lieut.-Col. F. Seymour Leslie, R.E., occupied the chair, and about a score of members were present.

The Chairman read telegrams from the President (Mr. Walter Emden), who was detained by business at Sheffield, and from Mr. Silvanus Trevail, of Truro, vice-president, both regretting inability to be present, and each expressing approval of the proposal to increase the subscriptions. The Chairman said the Council had come to the conclusion that it was essential if the society was to extend its operations that a larger sum of money should be placed at its disposal. The question of compulsory registration for architects needed to be pressed forward, and other matters affecting the well-being and interests of the profession were in view, and the only way to enable the society to do more than meet its working expenses was to increase the subscriptions. He would, therefore, formally move:—

> That Article No. 42 of the Articles of Association of the Society be amended by deleting the words "one guinea," and substituting for the same the words "two guineas."

Mr. H. Goodman Quartermain, hon. treasurer, seconded the motion, remarking that he had felt for some time that this forward step ought to be taken. They were no longer a third-rate body, but had a substantial membership, met in excellent rooms, and were exerting a useful influence on the profession. It was felt by the Council that a subscription of two guineas from Members and Associates alike was the minimum with which they could do to carry out their ideas, and he had confidence that the proposal would be agreed to.

Mr. A. H. Hallam, of Leicester, thought before such an important alteration in the constitution of the society was adopted a ballot of the members should be taken as to their wishes, for they could hardly call that a representative meeting of the society. He should not himself oppose the resolution.

Mr. G. A. T. Middleton thought such a course would be impracticable. It was necessary in the interests of the society that the subscription should be raised. The meeting had been duly convened, and there would doubtless have been a larger attendance had there been any strong opposition to the proposal.

The Chairman said the Council had already considered the matter, and should the motion be agreed to, as he confidently expected, would consult their solicitor, Mr. Farman, as to the best method of giving an opportunity, especially to provincial members, to express an opinion on the matter, before a second meeting was called to confirm the decision of that day. He then put the resolution, which was carried with one dissentient.

THE DAYS OF GRACE TO BE SHORTENED.

The Chairman said there had been some trouble in dealing with members who neglected to pay their subscriptions when due. The twelve months now allowed by the rules in which to meet their liabilities was taken advantage of to the full by a few, who were habitually a year behindhand, and gave needless bother to the secretary and treasurer. On behalf of the Council, he therefore proposed:—

> That Article No. 44 of the Articles of Association be amended by deleting the words "one year," and substituting for the same "six calendar months," and that these Articles as so amended come into operation on the 1st of November, 1899.

This was seconded by Mr. Quartermain, and unanimously agreed to.

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"BUILDING NEWS" DESIGNING CLUB: AWARD OF PRIZES FOR SESSION 1898-99.

We inaugurate the recommencement of our Club's work for the coming session by announcing the results of our competitions during the past year, and by awarding the prizes. The Building News Designing Club has signalised the attaining of its majority by a display of renewed vigour and increasing popularity. The many inquiries from correspondents anxious to join which we have received with the return from the summer holidays augurs well for the continued working of the Club, for without the co-operation of our readers the success hitherto so well maintained could not continue. The best results are not so much the securing of prizes, pleasing as such success to competitors always must be, but the permanent value of these competitions consists, of course, in the individual improvement thereby to be obtained by those who take a serious and steady part in them. It would be difficult to devise a scheme more calculated to inspire confidence and interest in a beginner's essays in design than the means furnished by our Designing Club, and certainly no better opportunity exists of making a pupil's work and abilities known amongst his seniors, to whom in the ordinary course of things he must look for employment in the near future. The awards are as follows:—

"McGilligan" (first prize), £10 10s., Mr. Charles Gascoyne, 628, Mansfield-road, Sherwood, Nottingham.

"Thistle" (second prize), £5 5s., Mr. Gilbert W. Fraser, 34, Balliol-road, Bootle, Liverpool.

"Swan" (third prize), £3 3s., Mr. Septimus Warwick, 98, Lancaster-road, Notting Hill, W.

Hon. mention is accorded to "Tokio" and "Dachs," and we commend "Nothe," he having ranked third twice.

LISTS OF SUBJECTS AND A RECORD OF SCORES.

A. — A Country House. — "Thistle," 1; "McGilligan," 2; "Trefriw," 3; "Swan," 4.

B.—A Mountain Church.—"McGilligan," 1; "Thistle," 2; "Tokio," 3; "Grip," 4.

C.—A Village Shop and Cottages.—"McGilligan," 1; "Thistle," 2; "Nothe," 3; "Tokio," 4.

D.—A Village Tavern. — "Thistle," 1; "McGilligan," 2; "Nothe," 3; "Vigornia," 4.

E.—A Small School of Arts and Crafts.—"Swan," 1; "McGilligan," 2; "Rikki," 3; "Thistle," 4.

F.—A Suburban Stable.—"McGilligan," 1; "Thistle," 2; "Swan," 3; "Quadrant," 4.

G.—A Small Parochial School.—"Thistle," 1; "Dachs," 2; "Swan," 3; "McGilligan," 4.

H.—A Golf Club House. — "Tokio," 1; "Thistle," 2; "Swan," 3; "McGilligan," 4.

I.—Pair of Semi-Detached Villas.—"McGilligan," 1; "Thistle," 2; "Dachs," 3; "Astragal," 4.

Session 1899-1900.

FIRST LIST OF SUBJECTS.

A.—A Bank in a Country Town in the main street, with a frontage of 50ft. The site is level, and extends 110ft. deep, with a rear right of way for dust-collecting, &c. The building to be four floors above the street level, the top rooms being partly in the roof. The basement to be utilised for strong rooms in the front part, while at the rear space may be used for the manager's kitchen and offices. There must be a clerk's cloakroom and lavatory. The ground floor to comprise a banking-room 40ft. wide, and good space for the public counter, which is to be 25ft. long at least. A waiting-room and managers' room suitable for a directors' meeting to be provided. Pitch of banking-room to be 14ft. 6in. in the clear from floor to ceiling. Upstairs the space to be utilised as a residence for the managers, and having five bedrooms. The cost of the building to be limited to £8,000, cubing the whole at 10d. per foot cube. Abstract of cubing to be given. Scale for elevation and section, 8ft. to the inch. Plans may be drawn to 16ft. to the inch. A perspective sketch is necessary. Material to be stone ashlar for the front. Rear side to be in brick. A private door for the manager's residence may be contrived in the bank porch; but a separate door is to be preferred. Style English Renaissance.

THE FOLLOWING ARE THE RULES OF COMPETITION.

1. Drawings to be sent within 28 days after the publication of the particulars of each subject.
2. One or more subjects will be given every month, from which a competitor may choose.
3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 22in. by 14in., with no washes or tinting in colour whatever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching," or blocked in. The scale to be used will be given with each subject.
4. Drawings to be forwarded, unmounted, by post, care befng taken to roll the short way of the drawing.
5. On entering the Class (which may be done at any time) each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.
6. Prizes of £10 10s., £5 5s., and £3 3s., will be awarded to the best series of designs. Our decision to be final.
7. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student. The same prize in future cannot be awarded more than once to the same student, and those who have taken a first prize cannot compete again.
8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.
9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

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THE HOLLAND FINE ART GALLERY.

An exhibition of pictures by famous Dutch masters, comprising many modern works by these felicitous painters of landscape and *genre*, and characterised by the naturalistic qualities and pathetic interest of the Dutch school, is now open at 235a, Regent-street. The collection is a small but select one, in which we find works by Wm. Maris, G. H. Breitner, W. B. Tholên, Kever Weissenbruch, W. Witsen, J. Bosboom, Sir L. Alma Tadema, R.A., J. Israels, Th. de Bock, and others. Most of these are known pretty well to the picture connoisseur. Their work show a direct appeal to nature, and all the true inspiration that comes from it. Mesdag's "Pinken," a couple of sailing boats apparently at anchor in a river, is a truthful rendering of the pearly tones and haze-veiled light of a calm Dutch river. The atmosphere and colour are strong. "Baby's First Walk," by Wally Moes, a Dutch girl teaching her baby sister to walk in a cottage interior, is a good example of the school; the figures are admirable in drawing, without being too technical or servile. G. H. Breitner's study of a "Japanese Girl" reclining on a tapestry couch in a red figured cloak admiring a small bunch of white flowers in her hand is well drawn, though rather crude in colour. Another clever piece of figure-painting is "Playmates"—two little girls watching with interest a lamb drinking milk from a small basin. It is natural and feeling in its handling. The pastoral by F. Duchattel, a riverside meadow with sheep, is truthful in colour and atmosphere; and the large monochrome view of canal, "Dordrecht," by W. Witsen, showing in elevation the quaint canal houses, is interesting as a study of the picturesque Dutch seaport, which is painted to a smaller scale by the late J. Maris. Dordrecht is a favourite subject with painters; this little view is admirable in its rendering and nice soft colour. The snowclad "Winter Landscape," by W. B. Tholen (9)—a cottage with a background of leafless trees surrounded by snow, which covers banks and hedgerows—has an undulating, almost sea-like, effect, and is vigorous and impressionistic in style. Few landscapes surpass Wm. Maris's "Cattle" piece, a meadow with cows, one drinking from a pool of water, vigorous in handling and colour. The sunlight effect after rain is capital. A water-colour sketch of cattle in meadow, by A. Mauve, is almost like an early aquarelle, its simple grey washes of colour outlined, the composition and grouping of the cattle are masterly.

The interiors of Dutch churches, by J. Bosboom, Nos. 11, 16, 31, are interesting little studies of these simple edifices, the drawing and perspective are true, and the chiaroscuro and tone pleasing. One shows a large pulpit and sounding-board. A. Mauve is represented by a pleasing "Dutch Riverside," admirable in its tonality of grey sky and atmosphere and the reflection in the water. One of the largest and most attractive figure subjects is Sir L. Alma-Tadma's "The Ambuscade" (17), a chariot of women and children encountering a party of crusaders lying in ambuscade. The scene depicts a dark corner of a forest, huge, cyclopean masonry obscures the light of day. A desperate encounter is going on, one horsemen with helmet is being stabbed, and his horse is falling beneath him; others lie in ambush beneath a large tree. The subject was painted in 1862, and exhibits all the technique and knowledge of costume and armour which distinguish this great Dutch painter, who is here seen in his earlier and more solid style of painting. The impassive faces of the women in the car is redeemed by the technical skill displayed. "Dolce far Niente," a handsome youth lying full length on a marble parapet or terrace wall, musing on the sphinx-like sculptured figure of a winged man on the pedestal, we have seen before. The sea beyond and the light and marble are exquisite. M. Maris's chalk figure sketch, "Cinderella" (19); the very admirable subject by Alb. Newhuys, "The Cradle" (25), a young peasant mother talking to her baby, is feelingly painted with naturalistic vigour. Through a deeply-recessed window the light enters the humble room and falls on the cradle, behind which a dark blue curtain forms a background. Another touching subject, a fisher-wife with her child in her arms, seated on a fish-basket on a sandy beach eagerly watching the sea, entitled "On the Look-out" (G. J. Israels), tells the story which the painter has so pathetically treated. The "Tiger Lilies" and "Iris," by Gerard Muller (26), is a pastel study; the bold sky and breadth of J. H. Weissenbruch's "Along the Dike," in water colour, in which the lighted clouds are abrased by rubbing are excellent. The collection is worth a visit.

THE WEST FRONT OF BATH ABBEY.

PROPOSED RESTORATION.

A MEETING of the General Committee was held on Friday to receive the report of Mr. Jackson, the architect consulted by the Executive Committee as to the proposed restoration of the west front of Bath Abbey. The Earl of Cork presided. Mr. T. G. Jackson's report, which was described by Sir Richard Paget as of a very conservative nature, only advocated new masonry where absolutely necessary to replace what had been effaced by the ravages of time. He summarised the repairs he regarded as advisable as follows: — Restoration of the parapets of west gable, and slight repair of the central niche and canopy. New head to the figure in the central niche, and securing of the trunk by copper dowels where split. New top canopies on single turrets, and partial repair to some others. Substitution of copper ties to some of the statues of the Apostles for iron. One new figure to replace one of which a mere fragment remains. Four new figures on the ladders at the top, and three new figures of angels on the ladders. Repair of label of great west window. New bracket over great window to carry the statue, with new shields and supporters below. Dressing the sculpture of spandrels with preservative solution, and taking casts of three angels. Completion of the three niches of lower part of front, and a statue in the central one. New supporters to the Royal arms. The executive recommend that these repairs be carried out, the estimated cost being £2,000.

The adoption of the report was moved by Canon Quirk and seconded by Sir R. H. Paget. Mr. F. Shum thought the pinnacles of the central tower erected in 1833 should be removed, as they were incongruous, or pierced so as to harmonise with those on the west end, but Archdeacon Bothamley, Mr. Foxcroft, and others thought their efforts should be confined to the west front of the building, and Mr. Shum withdrew his suggestion. It was stated that £1,067 was subscribed. The Executive Committee was empowered to proceed with the work, and to issue an appeal for the remaining sum required.

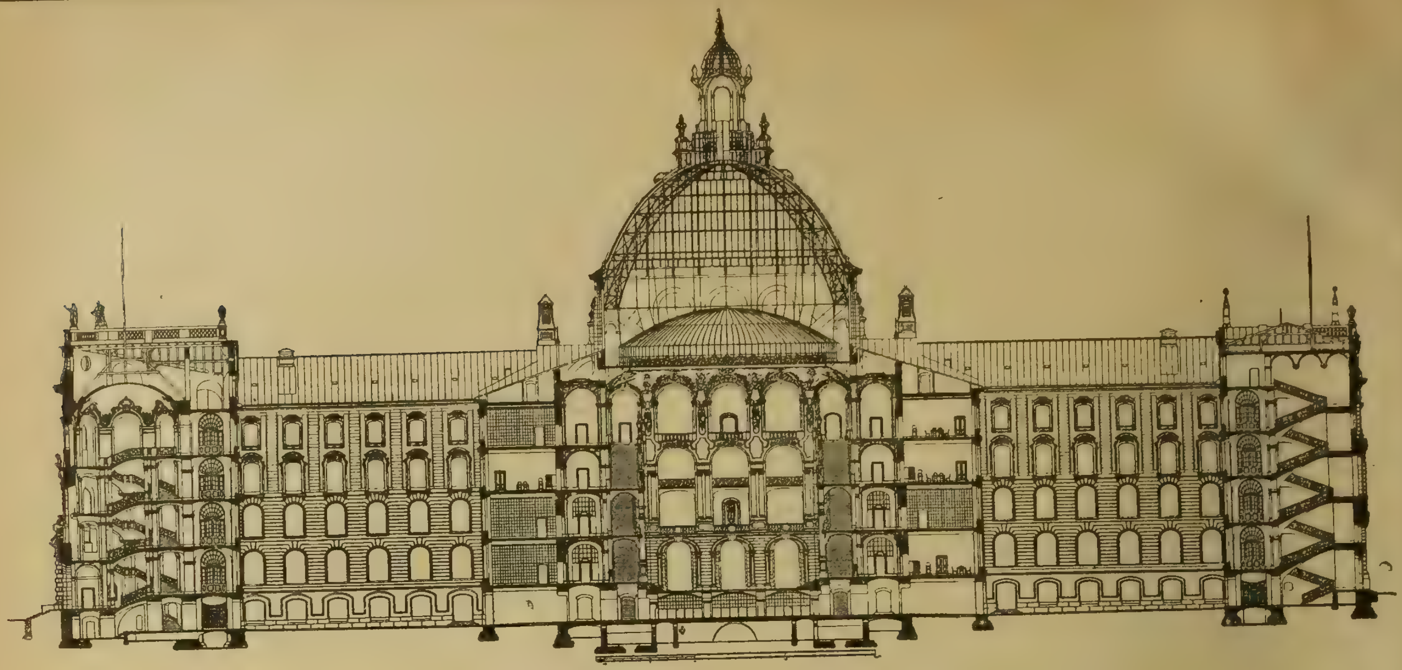
REGISTRATION OF TITLE IN LONDON.

THE chief assistant registrar has issued a memorandum on the forthcoming increase of compulsory registration of title in the county of London under the Land Transfer Acts, 1875 and 1897. It states that (1) purchasers, lessees, and mortgagees of freehold and leasehold land in the county of London north of the Thames are reminded that, by virtue of the Order in Council of July 18, 1898, made in pursuance of Section 20 of the Land Transfer Act, 1897, a considerable addition is made on October 1 to the area within which the system of land tranfer by registration of title is to be effectively established, which area will thenceforth comprise the whole of London north of the Thames except the City and North Woolwich. South London, North Woolwich, and the City follow at future dates specified in the same Order. (2) The effect of the Order in the area to which it applies is to introduce registration of title on all ordinary sales of freeholds, and on all sales of leaseholds having 40 or more years still to run, or two or more lives still to fall in, and on grants of leases or underleases for like periods. A lease and a reversionary lease will be deemed in most cases to create one continuous term. Registration does not apply to a lease created for mortgage purposes, or containing an absolute prohibition against alienation. (3) The mode of registration prescribed by the Act is registration with a "possessory title," which is effected on *prima facie* evidence only, and does not involve any official investigation. The *prima facie* evidence required for a possessory title is either (*a*) a conveyance or assignment on sale or a lease to the applicant; or (*b*) a statutory declaration by the applicant or his solicitor to the effect that the former is entitled, accompanied by the latest document of title in the applicant's possession. The first of these alternatives is the simplest, and is most usually adopted. (4) In the parishes in which the Order has been already in operation upwards of 1,400 registrations have taken place since the beginning of the year, embracing a great variety of freehold and leasehold properties. It has been found in these parishes that where (as is usually the case) the applicant can supply exact particulars of the property to be registered, the land certificate is issued within three or four days of the application being made. Cases in which further particulars are needed usually occupy about a week. (5) The usual procedure is for the applicant or his solicitor to attend at the registry with the deed, and a copy thereof for filing, written on stout paper, foolscap size, both sides, with inner margins, and copy of the plan (if any), and certified as correct, shortly after the execution. The land is then identified on the large scale Ordnance map kept at the registry for the purpose, and the draft entries for the register are prepared and settled with the applicant in the course of half an hour. The land certificate, together with the deed, marked with notice of the registration, are sent to the applicant or his solicitor, as soon as ready, by registered post. For cases where the purchaser or lessee effects a subsale, or grants a sublease, or creates a mortgage, before he has had time to apply for the registration of his original purchase or lease, Rules 78, 78A, and 78B will be found to contain a convenient procedure. (6) The *ad valorem* fee payable on registration is 1s. 6d. for every £25 in value, up to £3 for £1,000, and thence, at gradually diminishing rates, stated in the Fee Order of October 27, 1898, to a maximum of £25 for £32,000 and upwards. This includes the plan, the land certificate, and all other incidental expenses. (7) The registration of a purchaser as proprietor of the land under the Land Transfer Acts renders it unnecessary to register a memorial of the purchase deed in the Middlesex Registry. Priority dates from the delivery at the Land Registry of the application for registration. (8) Considerable facilities are now afforded by the rules for the registration of absolute titles, cost being ascertainable in all cases before the application begins. The registrar is empowered to accept a good holding title. It is suggested that purchasers of land and their solicitors might usefully consider the question of applying for absolute title at the same time as for the possessory registration. In that case, the possessory registration would be completed provisionally, only postponing the actual issue of the land certificate until the grant of the absolute title. This can usually be done within the two months required for the advertisement. The fee for the possessory title would be payable at once, the amount being allowed for when the absolute title is entered. (9) The business of registration for the County of London is carried on on the ground floor of No. 6, Portugal-street, Lincoln's Inn, which can also be approached through No. 34, Lincoln's Inn-fields. The office is open to the public from 10 to 4 throughout the year, except on Saturdays, when it closes at 2, and on Sundays, Good Friday, Easter Eve, Monday and Tuesday in Easter week, Monday in Whitsun week, Christmas Day, and the next following working day, when it is closed altogether.

FIRE TESTS WITH GLASS, ETC.

WE have received three reports issued by the British Fire Prevention Committee on some interesting experiments on glass. One of these relates to a fire test with casements made by the British Luxfer Prism Syndicate, Ltd. We have previously given the results of tests witnessed by ourselves and the summary of a report by this committee on the same excellent prisms. The report now before us gives us details of an investigation when the electro-glazing was with plate-glass. The tests are remarkable evidence of the resistance of the Luxfer prism to fire. In these experiments three casements of teak, filled with electro-glazed squares of plate-glass, in 4in. by 3in. squares, were exposed to fire and water for forty-five minutes at a temperature raised gradually to 1,300° Fahr. The glass casements were exposed to water on the outside and inside after the glass had been exposed to great heat. The report states that in five minutes the glass in one casement bulged inwards, smoke issuing between timber ceiling and top edge of casement. In fifteen minutes the teak casement was alight outside, but the glass was not displaced. After the application of water (twenty minutes from commencement) the glass cracked, but remained in the frames; in thirty minutes the glass in centre casement began to bulge, partly inwards and partly outwards; in another five minutes, the glass in one casement fell inwards, and a minute later the glass in centre casement fell inwards. In thirty-eight minutes the glass squares in the other casement along the top bent outwards, and began to soften. Over 1,600° Fahr. was reached. The photographs showing the casements both before and after the test are interesting, and the details and construction of the testing plant and observations of the experts of the sub-committee, of which Mr. Ellis Marsland is the directing member, will be read with interest. The Luxfer Prism Company, as well as the Council and sub-committee, were represented.

Another report of the committee describes the effect of fire and water upon Pilkington's wired glass in skylights; the test was to last thirty minutes, and the temperature was to be raised 1,500° Fahr., water being turned on for one minute at the end of fifteen minutes, and at the end of thirty minutes water was again turned on. The two skylights had each 4ft. 7in. by 2ft. 6in. of glazing in the clear, full details of which are given. The glass began to crack in one minute, in three minutes smoke came through joints round frame and brickwork. On the water being turned on from the top, the glass bulged inwards about 2in., but did not let the fire through, the water being retained in the hollow and gradually boiling away; in the other it filtered through two small holes. At the end of thirty minutes the glass was intact except cracks, and the fire did not pass through. The photo-illustrations showing the skylights before and after the



LONGITUDINAL SECTION OF THE PALACE OF JUSTICE, MUNICH.

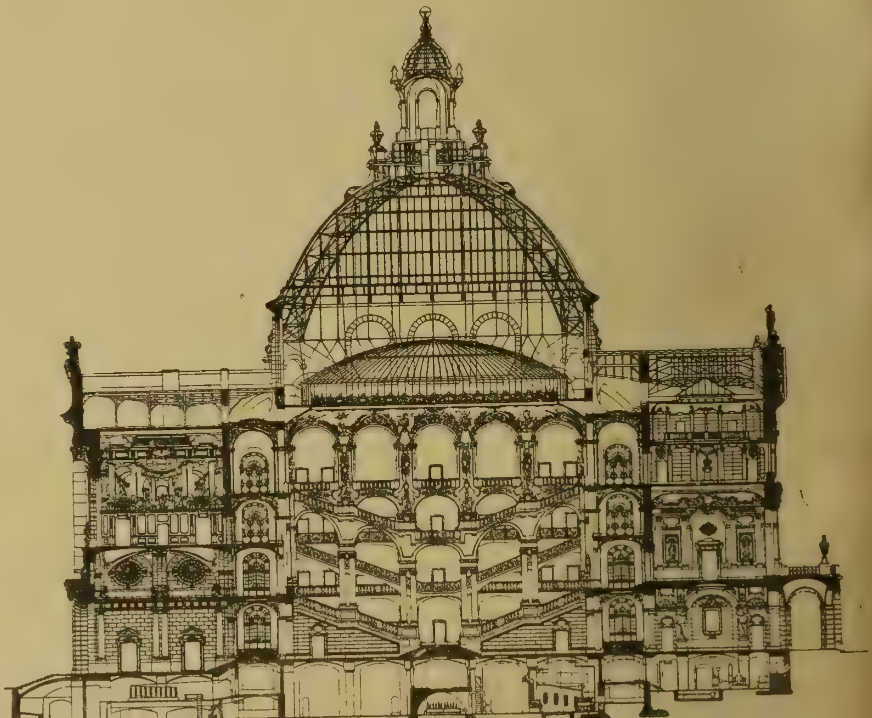
tests show the resistance due to the wired glass. Architects and others will do well to read the details of the plant and tests in these reports, as they show what science and skill has done to render windows and skylights, once the most vulnerable parts of a building, proof against the spread of fire.

A third report describes a floor of the Columbian Fireproofing Co., of Pittsburgh, New York and London, the details of which we cannot now give. The action of the fire test (a severe one) was to crack the plaster of the ceiling and encased beams; some of the plaster fell off on the application of water, but the concrete forming the body of floor was not damaged except that inclosing the beams. The fire did not pass through the floor, and the wooden fillets bedded in upper surface of concrete were uninjured. The results are important to the profession. Mr. Edwin O. Sachs' reports are useful contributions, and record the advances made in fire-resisting construction.

MODERN CONTINENTAL ARCHITECTURE.

[WITH ILLUSTRATIONS.]

THE illustrations given to-day of the Palace of Justice, Munich, and the Exhibition building of the Association of Secessionists, Vienna,* are chosen as representative examples of the exceedingly interesting subjects selected by Mr. Ernst Wasmuth for his latest architectural publication, which is edited by Mr. Hugo Licht, and issued under the title of "Architektur der Gegenwart," in large folio form, comprising photographic views, accompanied by plans and sections, with the descriptive text. The buildings represented display considerable variety of treatment from Germany, Austria, Belgium, and France, and in many ways, as might be expected, the designs thus reproduced are distinctly useful and suggestive. Modern Continental architecture presents many lessons to the English architect, and although we rightly set great store upon the individuality of style illustrated by the work of our leading designers in Great Britain, no impartial critic can for a moment fail to observe that much of our street building bears no comparison with the architectural achievements which distinguish the chief towns abroad. This discrepancy is emphasised very completely by the paucity of merit displayed by far the greater number of the new façades, which spoil all idea of monumental scale and proportion in our new thoroughfares in the Metropolis, to say nothing of our chief provincial towns. Charing Cross-road and Shaftesbury-avenue are familiar enough as illustrations in point, and even in our more distinguished buildings of this class, fussiness of detail and an absence of large broad ideals constitute the primary sources of failure. Without wishing to see any further development of the practice adopted by some English architects in imitating the mannerisms of the foreign schools, or by importing weak copies of Parisian and Berlin buildings, it cannot be denied that in many respects the designs of our Continental neighbours furnish much that is worthy of our emulation and praise.



CROSS SECTION OF THE PALACE OF JUSTICE, MUNICH.

Many reasons have often been given for the differences which mark the street architecture abroad as compared with English work of the same class, and most of the causes for this discrepancy originate in circumstances quite apart from matters of taste, and are dictated by conditions having little connection with architectural concerns. For the greater part, moreover, the English architect is more handicapped than the foreign practitioner, and, at the same time, he is frequently hampered by clients with a mischievous taste tending towards a love of the bizarre, and generally lacking in all sense of grace in line or beauty of form. Unless a façade is pretentious and showy, the ordinary Britisher fancies his money's worth has not been obtained. This feeling is pandered to, of course, by the mercantile architect who, as a rule, cares as little about artistic merit as his employers, and the natural result is that our thoroughfares are lined with meretricious elevations, vulgar and vapid fronts, quite beneath any recognised standard of taste or merit. Anything which may serve to redeem our streets from the continued repetition of such buildings must be welcomed, and Mr. Wasmuth's folios certainly must tend to aid in this direction. Our hopes are qualified, it must be admitted, by a knowledge of the density of the ignorance on art matters which stands in the way of any improvement. However progress is being made, things are not so bad as they were a decade ago, and th more architectural ideas are exchanged, the better Anything is preferable to a respectable mediocrity always excepting mere silly essays after wha used to be called "a new style."

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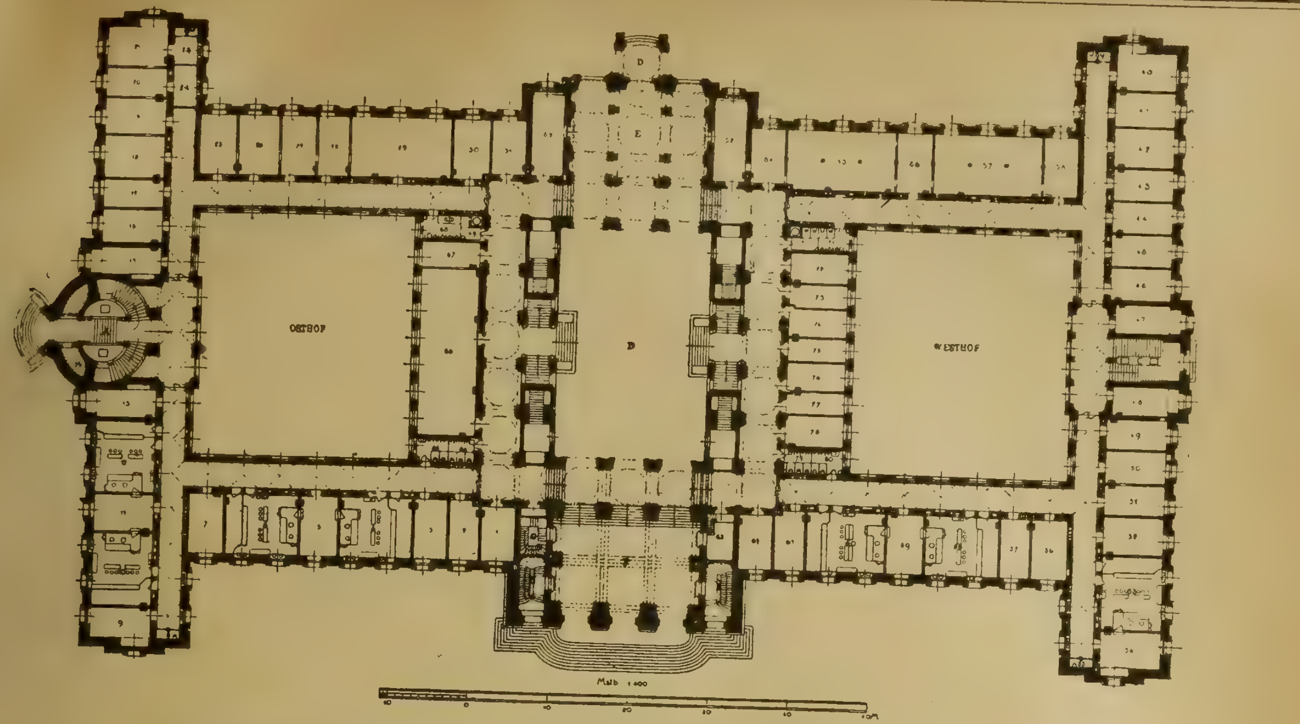
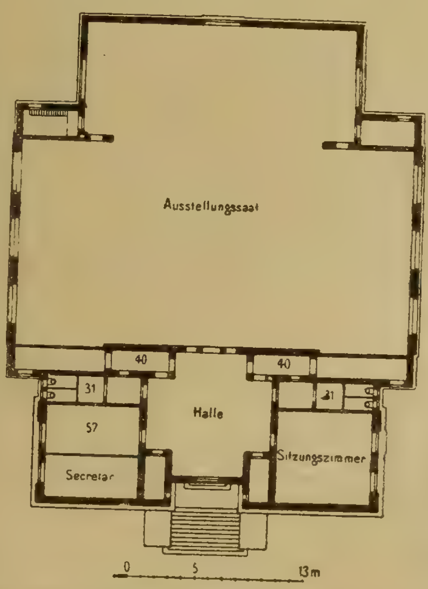
* Architektur der Gegenwart. Herausgegeben von Hugo Licht. Lieferung 19. Berlin: Ernst Wasmuth, Markgrafenstrasse. 1899.



GROUND PLAN OF THE PALACE OF JUSTICE, MUNICH.

Whatever the failings of Continental modern building may be, the representations which Mr. Wasmuth's book presents certainly do not on the whole err on the side of too marked an endeavour after originality. Mr. Otto Rieth's commercial building in Kronenstrasse, Berlin, is perhaps an exception, with a front nearly all glass, and having the stone divisional piers elaborated by bundles of tree-stems bound column fashion, the roots spreading as a base, and the squared mass of foliage above serving as a cap. This is done after the manner of the Arts and Crafts clique in London. The woodwork to the windows is thin, and cast-iron looking. A frieze of mosaic enrichments elaborate the studio-like brick front in Rue Defacqs, Brussels, by Mr. P. Hankar, architect, who has introduced some strange horseshoe-shaped windows invented for eccentricity sake rather than beauty. And to mention one other erection of a similar type, we may refer to the Café Secession, in Vienna, from the designs of Mr. Julius Deininger, an architect who mingles Art and Craft tree-growths with Chinese Dragons and Rococo surface sculptures in a strange medly best avoided. We have taken the exceptions just to prove the rule.

It would not be fair to pass from the subjects which rank as ordinary street fronts to monumental buildings like the Palace of Justice at Munich of which we give some illustrations to-day, while the picture gallery from Vienna, likewise given among our plates, belongs to another class still. The blocks of flats in Rue de Tocqueville, Paris, from the pencil of Messrs. Chas. Plumet and Léon Bénouville contrast better with them; the first-named architect's work having the preference. They are thoroughly French. An effect of colour is tried by Mr. Martin Dülfer in Schellingstrasse, Munich, which we do not like; but, apart from the detail, his front has the distinctive merit of a central feature broadly handled, while the lower part of the façade is in quiet contrast with it. Colotypes do not lend themselves to colour. and the attempt on this plate is a failure. The same architect shows a street front of a dwelling house in the same style in Kaulbachstrasse, Munich. The Swiss Chalet in the same town is out of place, and the villa Belzer, by Mr. Gustav Ziegler at Baden Baden, built of stone with elaborate gables and a spire, shows what to avoid in such a dwelling. The Schloss Pflugensberg, near Eisenach, is a large mansion of picturesque plan by Messrs. Neher and Kauffmann, built eight years ago with a tower and gables in half-timber work, many dormers and turrets skilfully introduced. The National Museum at Munich, of which Gabriel Seidl was the architect, is well known, and Mr. Karl Hoffacker's picture gallery in Berlin makes a good subject for some other plates. The gallery of the Austrian Society of Secessionists, of which we reproduce the view and plan, is exceptionally interesting. The metal dome of foliations carries that kind of thing to perhaps its utmost limit. Here again too we have the before-named Arts and Crafts trees for mural decorations, the idea of which came from Germany to be grafted on to ingle nooks and furniture up to date, done in hard woods and marble. This building, of which Mr. Joseph M. Olbrich is the architect, is in several respects unusually interesting. The plan displays the internal arrangement. The cornices and the secret water outlets to the roofs are notable points of detail, and so is the tank-like feature spanning the entrance, with the metal projections below its parapet. The Secessionists have emphasised in their building a degree of individuality intended possibly for distinctive purposes to mark their departure from recognised methods; and if this be so, the reason may justify the end in view. At any rate, the result is uncommon. With regard to the Palace of Justice, Munich, its description would occupy more space than we at present can command. The plan will show its great central hall, surmounted by the iron-built dome seen in the sections, and the two spacious courts extending east and west of the aforesaid hall. A rich feature is made of the eastern entrance, of which a photographic view is given, leading to a grand staircase, with courts located to the right, and others beyond along the main front. Mr. Fr. von Thiersch was the architect. Other views are given of the entire group of buildings.



Plan of the Picture Gallery of the Society of Secessionists, Vienna.

There are also several illustrations of a great variety of business premises, restaurants, and shops. The plates are well printed, and in all cases the points of view chosen seem admirable. Mr. Wasmuth's enterprise should meet with success, and, at any hazard, he endeavours to make his volumes thoroughly representative.

NOTES FROM EDINBURGH.

BUILDING operations everywhere, throughout the city's boundaries, have been proceeding with undiminished vigour, and with all the advantages accruing from steady summer weather. The Caledonian Railway Station is making extensive additions to its frontage in the Lothian-road, and its offices have nearly reached the limits of the goods station to the south. These buildings are in the same style as the lower portion begun when the more ornamental and stately section was in hand, and which will ultimately form part of the Station Hotel. The Waverley Station Hotel is making progress with the foundations of the north section, but to all appearance is much as it was three months ago, though preparation has been made to start with the third floor on the east side. The building operations in reconstruction of North Bridge-street on the east have made wonderfully rapid progress with the elevations to the street, both above and below the bridge. The latter, on the ground floor appear to provide very spacious and lofty warehouse premises, and are, accordingly, substantial, without any fancy decoration. The upper portion still to be erected will complete the east side of the street. The tenement now finished in its elevation to the High-street is a prominent feature at present, with the western side of the street demolished. The constructional design of the elevations has been very happily managed for distant effect, and in a way that gives it a character, which no amount of surface decoration could have given it. It thus gives a good object lesson of the greater importance of nice proportions in subdivision of the frontage. The deep recesses carried up through the two floors above the ground floor, with the corbelling and turrets of the uppermost portion, give the whole a much better architectural appearance in the distance than any of the much more ornamental edifices that break the long line of Princes-street. Very little of the merely decorative work appears upon the frontage, and although that may be considered of doubtful character in its travesties of "the pediment," it is not at all offensively obtrusive. The whole of the ground floor is of polished red granite, but this is still concealed by the hoardings. The upper portion is a very fine creamy-coloured freestone. On the western side, the work of clearance, which has been of Herculean magnitude, is nearly completed, and something has been done in the way of preparing concrete foundation walls. The Tron Church and steeple now stand out conspicuously from Princes-street, and the eastern portion of the church, which was shortened before to make width for South Bridge-street, is likely to suffer further curtailment, and the church perhaps total extinction, as an intruder on the new lines of North Bridge-street. The steeple, however, might remain to serve as a clock tower, and continue to serve the public in its gatherings to salute the incoming year with first-footing welcomes. Its absence on such occasions would certainly be felt as a loss by many, though many also would hail its absence as a boon if it displaced the ancient customary Saturnalia.

The recent legislation for advancement of higher branches of education formulated in the new code has been under consideration of the school board, with the result of making alterations and additions in two of the largest schools, and with a view to accommodate pupils in the northern and southern districts. In these a considerable amount of provision had been made already for extra branches of instruction, so that the work of supplementing the arrangements has been more speedily accomplished. The old system of an ex-Sixth Standard department remains as before, so that every convenience and arrangement is provided for any who may desire to remain, instead of leaving, as so many do, before any special talent has displayed itself. Another and very important addition is about to be made to the already ample provision made in the new University buildings for the advancement of medical science. The "Usher Institute of Public Health" will provide what is expected to be the most complete equipment for the experimental study of bacteriology, and thus supplement a deficiency that has been most forcibly impressed of late on those interested in the subject. In other respects, also, the new professorate will be fruitful of good results, and it is to be hoped some light may be thrown on the subject of sanitary engineering, which stands much in need of being simplified. The plans of the building are of such dimensions that a site has had to be found for it at some distance from the University, but in a higher and much more open situation—viz., in the wide thoroughfare of Warrenders Park-road. The architects of the building, Messrs. Leadbetter and Fairley, have made the plans, after inspection of the best Continental examples. The sum left by the late Sir John Usher was £20,000, and there has been little margin for architectural decorative details in the masonry. That is confined to constructive arrangement and the usual Classical details. It has three floors and three main divisions, indicated by the style of the north and front elevations, two larger divisions being at the extremities. That to the east contains the apartments for the experimental study—laboratories, observation and incubating rooms, &c. The western contains cellars and other operating rooms, with a large classroom and exhaust chambers, into which the noisome exhalations from the apparatus are drawn by an electric fan driven at great velocity, and other vitiated air of the apartments by another moving with less velocity. The middle portion contains hall, staircase, lift, professors' rooms, and students' reading-room, lavatories, &c. There is also a small entresol with the necessary experimental rooms for lady students. The appliances for ventilation, as indicated above, are of a very complicated description, each separate apparatus requiring a separate air-duct, carried through different floors, and from many separate points. The building is to be faced with a light-coloured stone from Doddington in Northumberland.

The National Portrait Gallery has recently received some considerable additions to the statuary, for which niches were provided in the original design. The front of the building, which looks north, has now had all niches east of the doorway filled, and these do much to relieve the somewhat flat appearance of the façade, which has no buttress projections. The large niche in the centre of the east front is also complete. The staircase hall is much improved by the rich colour of the crowded procession of Scottish worthies which adorn the gallery corridor. The interior throughout is sombre, the stonework being dingy red, with brickwork of the same character.

The exterior, as a whole, has kept its colour fairly well where the stone is dressed; but the decorative detail of the figures would have shown to much greater advantage with some grey or cream coloured freestone. The gilded names, put on some of the bases of the statues, have been removed—which is matter for regret, for though the public will not much concern itself in mistaking the identity of the figures—it might be as well to gratify a natural curiosity, and set the matter at rest in some legible fashion.

The installation of the electric light has been successful, and the demand for it and for electricity as a motive power is far in advance of the means available for supply. Another large establishment for generating and accumulating is approaching completion in McDonald-road, where also is one of the power stations for the cable tramway system. The extension of the cable system and the complicated arrangements required for junctions, have probably doubled the cost, originally estimated at £200,000. The patience of the public has been severely tried by the delay and obstruction of the thoroughfares. A few motor-cars run, as rival means of transit, at much greater speed, and in crowded thoroughfares get easily along.

The County Buildings, ever since the improvement scheme of 1829, when Geo. IV. Bridge was built, have been a blot in the architecture of the new street, the back elevation being without any dressed details of decorative character. Several designs have been proposed for its improvement at various times; but it was only with the advent of the County Council that any serious attempt was made towards the entire reconstruction of the edifice, which had become necessary. Plans and specifications for this were prepared about a year ago by Dr. R. Anderson; but for some reason or other these were set aside, and an open competition invited. The plans were lodged a month past, when they were remitted to Mr. W. W. Robertson, of H.M. Board of Works, for examination and report; but the result has not yet transpired.

WOODEN WATER-PIPES.

At the first glance our readers might be well excused if, judging from the title of our present article, they came to the conclusion that we were asking them to accompany us back to times of very primeval construction. But such is by no means our intention, and we trust, before taking leave of the subject, to prove to their satisfaction, that wooden conduits for the conveyance of water are regularly and carefully manufactured in large quantities in some of the remoter and more eastern countries of Europe, and are also in common usage in many parts of the United States. The old hollowed-out natural log, which answered very well on a small scale many years ago, has certainly disappeared; but although the mode of fabrication has been completely changed, the material is still strongly in evidence. Our American friends speak very highly of the wooden water-pipes, and their employment has been attended there with an amount of success which may fairly challenge a brief inquiry into their merits and an honourable recognition of them should they emerge triumphantly from the ordeal. Necessarily the comparison will rest between them and their metallic rivals, which are, under perhaps different conditions, of almost universal adoption. There are several methods employed in the manufacture of these wooden pipes, which have a general resemblance to the operations performed in the making of barrels and casks, the staves being tightened up by screw pressure, capable of adjustment, and hooped with steel bands or rings. These hoops are spaced at regular intervals, depending upon the diameter of the channel, the character of the timber, and the pressure to which the pipes are subjected. Red and yellow pine are given the preference to as materials, but other descriptions of wood are equally suitable.

It is obvious that the process of squeezing together the staves must put a very considerable pressure upon them, and it is considered advisable not to allow this pressure to exceed about 70lb. to 80lb. per square inch. The distance at which the hoops should be placed apart may be readily calculated from a useful formula due to Mr. Adams, which in its simplest form may be thus expressed. Let D = the distance separating the steel hoops, t the tension on a hoop, r the radius of the pipe, b the thickness of the staves, and F the pressure of the water in pounds per square inch; then—

$$D = \frac{2 \times t}{F\,(2 \times r + 3 \times b)}$$

It has been found in comparing wooden water pipes with these of cast iron and steel, that with respect to economy of cost and volume of discharge the wooden conduit is superior to its rivals; but it only takes the second place in point of durability, being surpassed in that qualification by cast iron, which, whatever form it takes—provided it has fair play—has no equal among its brother metals. The cast-iron arches of old Southwark Bridge are 70 years of age, and the material, although carrying much heavier loads than Rennie ever designed the structure to be exposed to, is as good and intact as when first put up. Columns of cast iron have shown equally satisfactory results, when they have escaped the attacks of fire, accentuated by torrents of cold water lavishly hurled at them. Other conditions being similar, the volume of discharge of a clean new steel water-pipe, with its initial internal coating of Dr. Angus Smith's solution, or of some other efficient preservative preparation, has been found to be equal to about 92 per cent. of that of a wooden pipe, both descriptions of conduit having a diameter of 12in. If this dimension be increased in each case to 6ft., the previous percentage falls to 70 per cent., and the diminution continues to augment with the length of service of the respective conduits.

It will be sufficient to quote a couple of examples to establish the fact that long services of water-mains have been laid with most successful results in timber channels. In the State of Utah five miles of wooden pipes are in active operation, with the large diameter of a little over 6ft. A few particulars of this main will probably not be uninteresting. The section of the staves comprising the walls of the channel is 25in. by 8in.; the diameter of the circular rings varies from ⅝in. to ¾in., and their respective distances apart are, on the average, for the smaller-sized rings about 4½in., and for the larger 6½in. Some 700ft. and 800ft. per day was the rate at which this main was laid. An extension of the conduit was executed in riveted-up steel tubes, at a cost of four times that of the wooden conduit. The pressure varied throughout the main at certain times, but reached its maximum at three atmospheres and three-quarters. The other example—that at Denver—is upon a much larger scale, and forms a water channel sixty miles in length, but with a considerable difference in the diameter of the pipes, whose dimensions vary from 1½in. to 3ft. 7in. at the most. According to the location, the available head of water ranges from 10ft. to nearly 200ft., and the discharge is at the rate of a million and a half gallons per day. The small, insistent weight of the timber channel is in its favour, especially when the pipes have to be laid in bad ground.

T. C.

INFLUENCE OF BACTERIA ON THE DECAY OF CEMENT.

The *Analyst* quotes from a paper by A. Stutzer and R. Hartleb on this subject in the *Zeitschrift angew Chem.* In 1896, Stutzer observed that the cement mortar which had been in use for eight or nine years as lining to a water-supply reservoir was converted into a brownish mud, containing less lime and more iron oxide, &c., than the original cement. This disintegration he ascribed, and still believes to be primarily due, to the solvent action of the carbon dioxide in the water, which dissolved the lime of the cement in the form of bicarbonate. But on extracting further samples of the mud from the same reservoir lately with sterilised water, the present authors found that it was highly charged with nitrifying organisms; so much so, that when introduced into a 0·1 per cent. solution of ammonium sulphate, the ammonia reaction practically disappeared in fourteen days, and nitrate reactions were given powerfully.

A similar experiment with asparagine only gave a nitrite reaction after six weeks, but here it was necessary for ammonia first to be formed before nitrification could set in. A further test with a 0·1 per cent. solution of sodium nitrite showed that nitrites were formed but slowly. It would appear possible, therefore, in the case of waters containing any appreciable proportion of oxidisible nitrogenous matter, that this production of nitrous acid by the agency of micro-organisms may play some part in the destruction of cement. The parallel action that is noticed in sea-water, unless the cement is fortified by the addition of extra active silica, is due rather to the soluble sulphates than to carbon dioxide, which is not present in such large quantities as in fresh water; it has not been feasible to determine whether bacteria assist in this disintegration likewise.

With reference to this matter, G. Barth, in the same journal, quotes another instance of cement decomposition occurring in three years where the water contained no unusual amount of carbon dioxide, and he seems to consider the previous explanation plausible.

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The Archbishop of York visited the church of Garton-on-the-Wolds, near Driffield, on Friday, to dedicate a carved stone pulpit and a number of carved oak stalls, the gifts of Sir Tatton Sykes.

For a new intermediate school to be built in Leighton-grove, W., for the St. Pancras Board of Guardians, Mr. A. E. Pridmore has been appointed architect, and Mr. T. W. Farthing quantity surveyor.

The Light Railway Commissioners held an inquiry on Thursday in last week into the scheme for the proposed light railway from Sinnington to Rosedale, at the close of which Lord Jersey said the commissioners would recommend the Board of Trade to issue an order.

The Isolation Hospital, Chorley, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester Stoves with descending smoke flues, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

On Tuesday week the parish church of Stalisfield, East Kent, was reopened by the Bishop of Dover, after having been restored at a cost of £560.

Mr. James Clark, M.A., Ph.D., of Ash Mount, Manchester, has been appointed principal of the Passmore Edwards Central Technical Schools for Cornwall, Truro, at a salary of £300 a year.

Special services were held on Sunday on the occasion of the reopening of the sanctuary of the Church of the Holy Name, Oxford-road, Manchester. The sanctuary has been closed for two months for decoration and the putting in of stained glass in the three windows over the altar. The subject of this central light is the Crowning of the Virgin, and the windows on either side are occupied with figures of St. Ignatius of Loyola and St. Francis Xavier.

Closing services were held on Sunday in the Primitive Methodist Chapel in Nelson-street, Newcastle-on-Tyne, rebuilt in 1837-8, which has been bought by Mr. Robert Herron, plumber, of Newcastle, for business purposes.

A Local Government Board inquiry was conducted on Friday at the urban district council offices, Morecambe, by Colonel Hepper into an application by the council to borrow £10,500 for works of private street improvements in both the east and west portions of the town; and £500 for another steam-roller.

At Birmingham, on Friday, St. Lawrence Church was reopened after restoration and enlargement of he chancel, at a cost of £1,400, from plans by Messrs. Franklin and Bushes, of that city.

Messrs. Walter Scott and Son, contractors, of ewcastle-on-Tyne, have commenced operations or constructing the new South Yorkshire Extension ailway from Wath to Wrangbrook, where it will oin the Hull and Barnsley Railway, and become a eeder to that line. The new undertaking is about ine and a half miles in length, and will serve two r three existing collieries, and at the same time end to the development of a vast track of mineral roperty.

The memorial stone of a United Presbyterian hurch, which is in course of erection at Abbey-ill, Edinburgh, was laid on Saturday. The rchitect is Mr. P. M. Cameron, of Edinburgh.

The foundation-stone of the new municipal uildings for Dumbarton was laid on Saturday by ord Overtoun, with Masonic ceremonial. The site or the new buildings in College Park grounds was gift, valued at £4,600, by Lord Overtoun to the urgh, and the buildings will cost about £15,000. hey are being built in red sandstone, from plans y Mr. James Thomson, of Glasgow.

The approaches to the new bridge over the River ndus at Kotri are complete, as also the masonry iers, which are six in number. The superstructure, hich consists of five spans of 350ft. and one span 100ft., is in progress. Two spans of 350ft. and he 100ft. span have been already completed. The ird span was not started owing to the approach the flood season last May, but the work is being ken in hand now, and the remaining three spans complete the bridge may be expected to be ished in May, 1900.

OBITUARY.

The death is announced of Mr. Joseph Clever, architect and surveyor, of 54, New Broad-street, E.C., who died at his residence, 27, Park-crescent, Brighton, on August 26, aged 74 years. Mr. Clever was largely engaged in the developing of estates, and, as a quantity surveyor, prepared the quantities for the Thames Embankment, the main drainage for London, and other large works. He was a very prominent Freemason, and held many testimonials from the brethren for his valued services in the Craft. In the latter part of his time he was assisted in his work by Mr. J. W. Start, F.S.I., of Colchester, who has now taken over the practice.

The death is also announced of Mr. James Hewitson Shaw, A.R.I.B.A., of 22, Billiter-street, E.C., and Folkestone-road, Walthamstow. Mr. Shaw, who became an Associate of the Institute by examination in 1895, was for five years assistant and for six years chief architect to the Anglo-American Oil Company.

Mr. Josiah Houle, F.R.I.B.A., died on Monday last at his residence, 71, Guilford-street, Russell-square, W.C., aged 77 years.

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CHIPS.

The Ecclesiastical and Educational Art Exhibition at the Church Congress, under the management of Mr. John Hart, is to be opened to-morrow (Saturday) by the Bishop of London. It is to be held in the north gallery of the Imperial Institute. Among the special features, besides a large quantity of Church plate, will be a unique display of beadles' staves. The exhibition will be open at noon, and the inaugural ceremony will be at 5.30 p.m.

At the parish church of Wellington, Salop, the new organ built by Messrs. Bevington, and Sons of London, is to be dedicated to-day (Friday).

Branch premises for the Bank of Ireland are being built near the Queen's Bridge, Belfast. The architects are Messrs. Millar and Symes, and the contractor is Mr. R. Corry.

We are requested to intimate that the Surveyors' Institution will be closed from Monday evening, the 9th, to Tuesday morning, the 17th inst., to facilitate the arrangements in connection with the President's conversazione on the 12th and 13th inst.

A medallion bust and tablet forming the public memorial to the late Mr. Wm. Gibbons, who was identified with Sunday-school work in Bristol, will be unveiled in the new porch of Brookland Church, Lower Ashley-road, in that city, on Monday, the 23rd inst. The work has been carried out by Mr. J. Adams-Acton, of London.

The drainage improvements scheme applied to Rock Cottages and the Plath, at Frant, Tunbridge Wells, has commenced work. The septic tank scheme has been initiated by the philanthropy of Sir Peile Thompson, and carried out under the supervision of Mr. Granville Streatfeild, M.R.I.B.A.

The Duke and Duchess of Westminster will visit Mold on the 17th inst., in order to open the new intermediate school, which has been erected at a cost of some £3,500.

A sub-committee of the Rochdale Corporation has decided to recommend the extension of the borough to include Castleton, in accordance with a scheme arranged with the Castleton Committee, which includes the provision for the latter place of a recreation-ground, slipper baths, a branch lending library, and technical classes.

At Bangor, County Down, a new Presbyterian church has just been opened. The building is polygonal on plan, having a glazed dome, and is seated for 1,000 persons. Mr. W. J. W. Roome, M.S.A., of Belfast, was the architect, and Messrs. McLaughlin and Harvey, were the builders.

Mr. Crooks, the chairman of the bridges committee of the London County Council, opened on Tuesday to the public a piece of ground at Northumberland Wharf, Poplar. The land in question forms part of the site that has been acquired by the Council for the erection of buildings necessary for the lighting of the Blackwall Tunnel.

The fourth section of the Madras electric tramways from Central Station to Pursewalkum was opened for traffic at the end of August.

At a meeting held at Wellington, Salop, last week the designs for the Banning Memorial windows in the parish church, which is in course of restoration, were finally selected. The work is to be intrusted to Messrs. O'Connor and Taylor, London, and the new windows will be placed in the south aisle. The subjects chosen are Christ Stilling the Tempest, and Christ bidding the Disciples to follow Him.

Mr. George Tangye, of the famous engineering firm, has collected some most valuable relics of James Watt, inventor of the steam-engine, and also mementoes of James Boulton. Mr. Tangye's interest has not been confined to mechanical relics. He has also preserved interesting documents belonging to the firm of James Watt and Co., which, in spite of the illustrious name, came to an inglorious end. The Watt and Boulton collection is about to be presented to the City Museum of Birmingham.

Newquay Urban District Council met specially the other evening to consider plans and estimates, prepared by the surveyor (Mr. J. Ennor, jun.), of a proposed drainage extension at the western end of the district to remedy the existing defective outfall. The plans provided for the extension of the present system in a northerly direction by a tunnel, and thence east-north-east by an open cutting. The outfall would be 160ft. north of the present outfall, and in 6ft. of water at spring tides. Pipes 2ft. in diameter would convey the sewage into the sea. It was calculated that the work could be done for £450, but if 510ft. of 15in. pipes 300ft. from the outfall were taken up and replaced by larger ones the cost would be increased to £720. It was decided to carry out the smaller scheme forthwith.

The Archbishop of York will visit Bristol on the 19th inst., to unveil the fine reredos erected in the Cathedral to commemorate Bishop Ellicott's connection with the See. The reredos was designed by the late Mr. J. L. Pearson, R.A., and contains the effigies of historic personages connected with the See and Cathedral, amongst those represented being Bishop Trelawny, who was sent to the Tower for not reading James II.'s declaration in 1688; Bishop Butler, and, of course, Bishop Ellicott.

Colonel W. Langton Coke, M.Inst.C.E., held an inquiry recently at the town-hall, Birkenhead, on behalf of the Local Government Board, respecting an application by the Birkenhead Corporation to borrow £5,000 for supplying electricity to the outlying townships of Bidston and Noctorum, £2,000 for enlarging the Holt School of Science, and £330 for purchasing property for street improvements.

The first place of worship in Plymouth to adopt electricity for lighting is George-street Baptist chapel, where this new illuminant was inaugurated last week. The building has been wired and fitted up for the electric light by Mr. A. S. Parker, architect, of Plymouth.

At St. Peter's Church, Dorchester, Dorset, a new reredos was dedicated on Wednesday in last week. Designed by Mr. C. E. Ponting, F.S.A., it has been executed by Messrs. Harry Hems and Sons, of Exeter. The main part is built of Painswick stone. The sculpture is in white alabaster; whilst the framing around the great central panel, 6ft. 6in. by 3ft. 6in., which contains a representation of the Last Supper, founded on Leonardo da Vinci's well-known painting, is of richly-veined English alabaster obtained in Derbyshire.

At the Chester Consistory Court, on Friday, faculties were granted for placing a stained-glass window in the north aisle of St. Winifred's, Buckley; another in the north of the nave of Wistaston Parish Church; and for erecting a memorial tablet in Bunbury Parish Church to the Gardner family, of which the present vicar is a member.

In the great 15th-century parish church of Cromer a window on the north side of the modern chancel has been filled with stained glass as a memorial to the late Rev. Frederic Fitch, for 63 years curate and vicar of the parish. It represents the Parable of the Sower, and was formally dedicated last week.

The Local Government Board have refused the Lancaster Corporation permission to take into the borough the outlying parishes of Bulk, Scotforth, and Skerton. The present area of the borough is only 1,680 acres, and the proposed additions comprised 5,137 acres, practically all of a rural character.

Mr. Dixon, of Oldham, has been appointed architect for the proposed new Liberal Club at Shaw, near Rochester, which is to be erected on the vacant land near to the police-station in Rochdale-road. It is proposed to spend £2,500 on building and furnishing.

Mr. Charles Perrin, M.Inst.C.E., an inspector of the Local Government Board, held, on Tuesday, an inquiry at the town-hall, Cromer, into the application of the urban district council for sanction to borrow £4,000 for the purchase of the Fountain House property and the erection thereon of council offices, a fire-station, and public conveniences, and £3,000 for works of sewerage and sewage disposal.

A Primitive Methodist chapel was opened in Church-road, Walton, near Liverpool, on Sept. 28. It is of Gothic architecture, simply treated, and has accommodation for 350 persons, besides having a schoolroom capable of seating 350 scholars, and six classrooms. The total cost was about £3,000. The architect is Mr. F. W. Dixon, of Manchester, the contractors being Messrs. J. and G. Chappell, of Walton.

Building Intelligence.

Belfast. — Foundation - stones of the new Magdalene Church, Donegall Pass, were laid on Saturday afternoon. The old church, which dated from 1838, was the scene of a disastrous fire in December last, and the damage thus inflicted was so great that the congregation decided to pull the building completely down and to erect a new structure on the same site. The contract for the entire work was given to Mr. James Kidd, and the edifice is being built from design by Mr. S. P. Close, A.R.H.A. The Gothic style is being adopted throughout. The area to be covered by the building is 75ft by 106ft., and sitting accommodation is being provided for 700 persons. The estimated cost of the structure is £5,000, which will include vestry and adjoining hall. Local stone is being used, with Scotch white stone dressings for the windows, and Bath stone in the interior. The heating of the premises is to be carried out on an entirly new hot-air system. The woodwork will all be of the best polished pitch-pine, and the church will be lighted by electricity.

Ealing, W.—The urban district council have just adopted a scheme for the erection of municipal workmen's dwellings. The site is known as Brown's Orchard, and is situated at the corner of Ealing-road South and Pope's-lane. It is 6½ acres in extent, with two entrance-roads, and is bounded on the east by an old public path, and on the south by the cemetery. A draft scheme has been prepared, which provides for the erection of two classes of houses on the estate, at rentals of 6s. 6d. and 8s. 6d. respectively, the total expenditure on which works out at £37,300. The frontages on the two new roads will allow of the erection of 121 cottages, on plots 80ft. deep. The first class of houses will consist of 54 cottages, having four bedrooms, sitting-room, living-room, scullery, larder, and w.c. In the second-class houses, 67 in number, the accommodation will be the same, except that there will be two bedrooms instead of four.

Exbourne, Devon.—The completion of the restoration of portions of the parish church was celebrated on Thursday in last week. The church was in a bad state of decay when the work of restoration commenced. The north wall of the nave was taken down, the stones marked for use again, and the whole has been rebuilt. The chancel has been rebuilt, but the east window is retained, also the piscina; a new vestry has been erected, and great improvements made internally. The centre block of high deal pews has been taken away, but the side pews remain, and are of the old-fashioned box kind. The present section of the work embraces the removal of a decayed and unsightly Georgian plaster ceiling, and the erection of an oak roof, with carved vine cornice and bosses. The vine cornice was executed by Mrs. D. W. Oldham. The centre flooring of the church is now formed of wood blocks. The chief work has been the re-erection of the 15th-century screen between nave and chancel. This is of early design, dating from about 1440. The screen was taken down about the year 1835, and was allowed to become sadly dilapidated. It has, however, now been restored by Mr. Herbert Read, of St. Sidwell's, Exeter. The architects for the restoration, which has cost £1,700, are Messrs. Tait and Harvey, of Exeter.

Glasgow.—The annual statement in connection with the year's building in Glasgow has been made in the Dean of Guild Court by Sir James Bell, Lord Dean of Guild. It stated that during the year there had been an increase in the number of linings to 681, but a decrease in valuation to £2,017,330. In houses and shops there was a decrease in linings from 167 to 114, with a corresponding decrease of valuation from £1,240,410 to £921,385. In public buildings the linings were fewer in number—five as against fourteen—but the valuation showed an increase, being £144,000 as against £135,710. In churches and halls there were fewer linings—12 as against 19 in the preceding year, or a decrease of £2,700 in value. In warehouses, stores, and workshops, though there was a decrease in the number of linings, for the first time in the court the valuation exceeded half a million, amounting to £516,490. With regard to alterations and additions, there had been 402 linings, with a valuation of £341,775. This was nearly £100,000 in excess of any year in the past twenty, and the health authorities must be heartily congratulated. The formation of streets also had proceeded very rapidly, 35 linings having been granted for 9,262⅓ lineal yards. The year's work evidenced a great prosperity in the building trade.

Heaton, Newcastle-on-Tyne.—The new church of St. Gabriel was consecrated on Friday last. Only a portion of the projected building has as yet been erected. The church, when complete, will consist of nave, with north and south aisles, transepts, chancel, morning chapel, baptistery, organ chamber, and vestries, &c., with a tower on the north side of the church. The dimensions of the finished church, which is to accommodate 1,000 persons, will be:—Length from east to west, about 150ft.; breadth across the naves and aisles, 55ft.; breadth across the transepts, 114ft. The nave arcade is of moulded stone, with shafts joining a hammer-beam roof. The clerestory and other principal windows are worked in open tracery. The baptistery, situate immediately to the west of the south porch, is apsidal. The morning chapel, situated at the east end, is also apsidal, and will be fitted with inclosing oak screens, as also will the arcading between the chancel and the ambulatory. The floor is of concrete covered with wood. The whole edifice will be built of stone, and the roofs covered with green slating. The interior wood fittings are intended to be in oak, marble, alabaster, and bronze being used for other fittings. The church is designed in the English phase of the Decorated style. Immediately to the west of the church the vicarage will be erected. The portion of the church already built consists of nave, south aisle, and porch only, and will accommodate 500 worshippers. A short chancel and vestries are temporary. The internal fittings are all of a temporary nature. The architect is Mr. W. Frank Rich, Eldon-square, Newcastle-on-Tyne.

Leeds.—The Leeds Industrial Co-operative Society is about to erect in David-street, Holbeck, an extensive bakery. A memorial-stone of the new building, which has been designed by Mr. W. S. Braithwaite, architect, South-parade, was formally laid on Saturday. The building will be of three stories, and cover an area of 940 square yards. The baking will be carried out on the ground floor, six draw-plate ovens being provided. On the same floor rooms will be devoted to the cooling and storage of bread and confectionery, and the manager's office and the check and time-office will here also be situated. The preparation of dough, &c., as well as the manufacture of boiled sweets, will be conducted on the first floor. The second floor is to be utilised for the storage of flour, and for fruit-cleaning, jam-boiling, and packing. Confectionery will also be stored in the basement, where the engine-room will be situated. Dining-rooms, cloakrooms, lavatories, &c., will be provided for the men and women employed. Externally the building will be constructed of red pressed bricks, in a plain but substantial manner. Internally the walls will be faced with glazed bricks. The floors will rest on steel joists and concrete, and the whole structure will be fireproof. The society's building department will undertake the work of construction, including the plumbing and painting.

Liverpool. — Branch banking premises are being erected in Castle-street for Parr's Company. Externally, up to the first floor, the wall material is unpolished granite from the Kemnay Quarry, Aberdeenshire. The main entrance is a large archway with rusticated voussoirs in the centre of the front. Above the first floor the walls are faced with unpolished marble of a cream-white tint, quarried at Piastraccio. This is relieved by grey-green bands of Cipolino marble. The window architraves and cornices and the main cornice are of red terracotta. The banking hall is a circular apartment 60ft. in diameter and 20ft. high, lighted by a circular dome light 20ft. in diameter. The walls of the area separating the front and back offices are carried over the circular hall by steel girders. The walls are to be wainscoted, and the upper part faced with Cipolino marble. Below the ground floor are placed the bank's strong-rooms and treasury. It is intended that the floors above the bank should be let as offices. The architects are Mr. R. Norman Shaw, R.A., and Messrs. Willink and Thicknesse; and the contractors are Messrs. Jones and Sons, of Liverpool.

Willaston, Nantwich. — The foundation-stone of the Willaston Unitarian School was laid on Sept. 28, by Sir J. T. Brunner, Bart., M.P. The school is situated on the Grove Estate, about a mile from the town of Nantwich. The estate was the property of the late Mr. Philip Barker, the founder of the school, and includes some 21 acres. The buildings, which are being erected by Messrs. Neill and Sons, Manchester, from plans prepared by Mr. J. W. Beaumont, architect, also of that city, will be rectangular, inclosing a courtyard. They will comprise a schoolhouse (including the headmaster's house), four classrooms, a dining-hall, three dormitories (for twenty, ten, and ten boys respectively), a library and reading-room, and studies for the senior boys; covered playground, workshop, gymnasium, and cycle-house, and a sanatorium for infectious cases, detached from the school buildings and on the opposite side of the road. Dormitory accommodation will be provided in the first instance for 40 boys. In other respects the buildings will be sufficient for 60, and even a larger number of boys can be provided for by the erection of a second house in a separate portion of the grounds. The school is planned on the system of residence in separate houses. Cricket and football fields and a fives court will be provided. The school has an endowment from the late Mr. Barker of £23,000. A sum of about £15,000 is estimated as the cost of completing the buildings and laying out the grounds, and towards that nearly £7,000 has been given.

York. — The new ward for children at the County Hospital was opened on Saturday by Mrs. Thynne. The new wing comprises a ward 70ft. long by 24ft. wide, and provides accommodation for 18 cots, an isolation ward for three cots, dayroom, ward kitchen, separate bath and lavatory accommodation, and, on the south side, a large sun verandah. One of the features of the ward is that it is firepoof throughout. The building is raised five feet above the ground in order to lift it above any damp that may run from the soil. It is one story high, and is finished with a flat concrete and asphalte roof, so that a second story can be added if ever required. The erection of the new ward necessitated the removal of the old mortuary, and a new mortuary block has been built at the east end of the main building. The total cost of the new buildings has been about £4,000, and the work has been carried out from the designs and under the general supervision of Messrs. Demaine and Brierley, architects, York.

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CHIPS.

A three-light stained-glass window, in memory of the late Randolph Sturgess Armitage, was dedicated in Pudsey parish church on Saturday.

The corner-stone of the new church of St. Werburgh, Wilbraham-road, Chorlton-cum Hardy, was laid on Friday by Earl Egerton of Tatton. The new church is to be Gothic in style, and will be of brick, with terracotta dressings. Accommodation is to be provided for 500 worshippers, and the cost will be about £5,000. The architect is Mr. R. Bassnett, Preston, and the contractor Mr. R. Carlyle, Ardwick.

An isolation hospital is about to be erected near Blandford by an arrangement between Viscount Portman and the rural district council. The building will be erected at a cost of £1,500 from plans already prepared by Mr. Hunt, architect, and on land belonging to Lord Portman, who will meet the outlay on the hospital, charging the rural authority a rent of £25 a year.

The reredos in St. Mark's Church, Coventry, has lately been completed. The work has been executed by Mrs. Arthur Hulton (*née* Miss Lister-Kaye), and consists of the representation of eight of the Apostles. The paintings are taken from copies of pictures by Raphael, Zuccaro, Albert Durer, and Lucas Cranach.

The board schools at Castlethorpe, Northants, built in 1891, have just been enlarged from plans by Mr. H. H. Dyer, of Northampton, and were reopened last week. The builder was Mr. J. M. Panting, of Northampton.

At the quarterly meeting of the Court of the Plumbers' Company, held at the Guildhall on Friday, Mr. Frederick Machin was sworn into the office of Master, and Mr. Philip Wilkinson and Mr. Charles Hudson into the offices of Warden and Renter Warden respectively, for the ensuing year.

The first stone of a presbytery to be built in connection with the Roman Catholic Church of Our Lady and St. John, at Blackwood, near Glasgow, was laid on Sunday week. Mr. William Ferguson, of Glasgow, is the architect, and Messrs. Leggett and Neill, of Stonehouse, with Mr. Stewart, of Lesmahagow, are contractors for the work.

Engineering Notes.

Railways near Waterhouses.—The Duke of Devonshire cut, on Tuesday, the first sod of a light railway which is to be constructed, under the provisions of the Light Railways Act, in North Staffordshire. The North Staffordshire Railway Company have projected a new line of full gauge running from Leekbrook to Waterhouses, and branching, on the way, to the Caldon Quarries. The light railway, which will be of 2ft. 6in. gauge, will run from Waterhouses to Hulme End, near the Hartington Station of New Buxton, in Derbyshire, a distance of over nine miles, and will, it is hoped, develop a tourist as well as mineral and agricultural traffic. The country to be traversed necessitates many sharp curves and considerable gradients. The capital required is £35,000, of which £10,000 is given by the Treasury, an equal sum being advanced on easy terms by the County Council, and the remaining £15,000 is in course of subscription by the public.

CHIPS.

At a cost of £1,000 to the ratepayers, the remainder of the outlay being met by private subscriptions, the city council of Norwich are about to purchase and demolish the Suffolk Hotel in the Market-place, a corner property at the foot of a flight of steps, the removal of which will open up a better view of the great Perpendicular church of St. Peter, Mancroft, from the Market.

At Waterloo, Liverpool, a new church-school for boys was opened last week by the Earl of Derby. It is situated in Melrose-road, has a central hall 65ft. by 50ft., and two other large rooms. Accommodation has been provided for 500 scholars, at a cost of £5,000. Mr. James Taylor, of Waterloo, was the contractor.

The foundation-stone of St. Andrew's Church, Bournemouth, was laid with Masonic honours on Tuesday afternoon by the Provincial Grand Master of Hampshire and the Isle of Wight, Bro. W. W. B Beach, M.P.

The foundation-stone of St. Deiniol's Library, Hawarden, the national memorial to Mr. Gladstone, was laid yesterday (Thursday) by the Duke of Westminster.

The Bishop of Ely reopened, on Friday, on its restoration after a disastrous fire eighteen months ago, St. Peter's Church, Hepworth, Suffolk. The cost of the restoration was considerably over £2,000, nearly the whole of which amount has been already raised by the rector and churchwardens.

An open space of just over five acres at the Caledonian-road end of Market-road, a broad thoroughfare on the south side of the Corporation Market, and a few yards above Pentonville Prison, has been purchased by the Islington Vestry for £16,000 from the City Corporation, and is about to be formally dedicated to the public.

A new Unitarian church was formally opened in Manor-road, Liscard, on Saturday. The church has been erected, at a cost of £5,000, by Mrs. W. Elam, in memory of her late husband, and has been designed by Messrs. Ware and Rathbone, Dale-street, Liverpool, Mr. James Merritt, of Birkenhead, being the contractor. The church is faced with Ruabon bricks with white stone dressings, and will accommodate 300 persons. It includes a schoolroom, and at the rear there are the vestry, library, and kitchen. The buildings are lighted by electricity.

Besides glove-making, Yeovil has now its brickworks, from which great expectations are formed, the output at present being something like 12,000 a day. The company, who reckon on half a century elapsing before the present supply of brick earth is exhausted, are negotiating with a London firm of contractors who will take 50,000 a week.

Colonel A. G. Durnford, R.E., an inspector of the Local Government Board, held an inquiry at St. Helens Town Hall on Friday into an application by the corporation for sanction to borrow a total of £13,860 for various works of improvement in the town.

New baths are being erected in Prince of Wales-road, Kentish Town, for the vestry of St. Pancras, Mr. T. W. Aldwinckle being the architect. The two swimming-baths for men will each have a water area of 100ft. by 35ft., and those for women will be 75ft. by 25ft. and 50ft. by 20ft. respectively, and the usual slipper-baths will be provided for both sexes. The estimated outlay is £57,500.

The village church of Frome St. Quinten was reopened last week after restoration, both internal and external, effected from plans by Mr. J. Nichol-Johnston, A.R.I.B.A., of Yeovil. The contractors were Messrs. C. and A. Hann, of Bedminster.

COMPETITIONS.

Birmingham.—The School Board considered on Friday a report proposing the adoption of draft conditions to be furnished to architects desirous of providing plans for the school to be erected on the site in Handsworth New-road. Mr. Milward suggested that the leading architects in the city would not compete unless it was understood that the committee, as assessors, would have the advice of a professional architect to be appointed by the board. He proposed, as an amendment, that a professional assessor be appointed to advise the committee. The Rev. J. A. Sharpe proposed, and the Bishop of Coventry seconded, that the clause dealing with the matter should be referred back to the committee. The amendment to refer the matter back was lost, and Mr. Milward's was agreed to. The resolution, as amended, was then adopted.

Edmonton.—The President of the Royal Institute of British Architects has acted as Assessor in the limited competition just held at Edmonton for public baths and additions to the Council offices and meeting chamber, a mortuary, post-mortem room, extensive stores, stabling, and cart-sheds, for the administration of the district. The plan covers a considerable amount of land. Mr. Emerson's award has been confirmed by the District Council, and Mr. W. Gilbee Scott, F.R.I.B.A., has been appointed the architect for the undertaking.

Northampton.—In June last the school board invited competition for plans by architects practising in the Borough of Northampton for new board schools to be erected in Barry-road. The whole of the school is to be on the ground floor, with sufficient accommodation for 420 boys, 420 girls, and 540 infants. The boys' and girls' departments are to be provided with a schoolroom and classrooms, while the infants' department is to have a central hall and classrooms, which are to be sufficient to accommodate the whole of the scholars. A provision was made for designs to be sent in without the author's name, but under a motto. There were eight competitors, and nine plans, as follows, the adjudicator being Mr. T. J. Bailey, F.R.I.B.A., architect to the London School Board:—Messrs. Law and Harris, St. Giles'-square, "Minerva"; Messrs. C. Dorman and Son, Abington-street, "Supervision" and "N.S.B."; Mr. M. H. Holding, "Practical"; Mr. W. Hull, "Education"; Mr. W. Shaw, "Light and Air"; Mr. H. Norman, "Alpha"; Messrs. Mosley and Anderson, "Ideal"; and Mr. F. Dorman, "Through Ventilation." The adjudicator's award is:—"Minerva," 1; "Supervision," 2; "N.S.B.," 3. The designs by the winners show that the boys' and girls' school has been placed in a rectangular building facing the Barry-road, the boys' school being divided from the girls' school by means of a hollow wall, and the infants' school being a separate building facing the road on the south side of the site. The boys' schools and the girls' school have a central corridor with classrooms on either side, and a schoolroom at the end, thus allowing direct communication with any part of the building without disturbing the occupants of another portion. Messrs. Law and Harris deviated from the ordinary plans, insomuch that their schoolrooms were not passage rooms to the classrooms or playgrounds, but were so arranged as to be easily converted into classrooms by means of the folding central partitions, with direct access to each. They are also lighted mainly from the two ends, thus giving left lighting in the one case and right lighting in the other, which obviates the nuisance caused by the objectionable glare direct in the eyes of teachers and scholars, as is always the case when schoolrooms have their main windows on the side walls. The infants' school comprises a spacious central hall, around which are grouped the classrooms, two being set apart for babies, with a separate entrance so arranged that access is possible without going into the central hall. The entrances for the scholars are arranged so as to be approached from the playgrounds, thus minimising to a large extent the quantity of mud or snow brought into the building if they are approached direct from the street. The whole of the class-rooms are lighted by large windows placed on the left-hand side of the scholars and carried up to within a few inches of the ceilings, also with supplementary swing windows on the opposite walls having their sills high up, which are introduced for the purpose of cross-ventilation. The schoolrooms are lighted from the left hand and right hand respectively, with supplementary windows as described above. The external elevations will be carried out in pressed sand-faced bricks and Bath stone dressings, and the roofs covered with green slates, while the whole of the external walls will have glazed brick dados 4ft. high, and finished in plaster above. The estimated total cost, including desks and other necessary fittings, is placed at £14,300. Messrs. Dorman and Son's design "Supervision" shows infants' classrooms grouped round the central hall, lighted from the top, while the plans signed "N.S.B." provide for a large hall lighted from one side with a west aspect. The boys' and girls' schools in both cases are planned to take the best advantage of the sun, so that the rooms shall be bright and cheerful.

Playing-card Designs.—The Court of the Worshipful Company of Makers of Playing Cards met on Wednesday to award the prizes in the recent competition for the designs of the backs of playing cards. There were 147 designs sent in, and ultimately the Court awarded the "H. D. Phillips" prize of £10 10s. to Miss S. R. Canton, of 6, Beaumont-street, W. The second prize of £5 5s. was awarded to Miss May C. Goodhall, of 27, Nevern-square, Earl's Court. The third prize of £3 3s. also fell to Miss Canton, and the fourth prize of £2 2s. was won by Mr. F. Lambert Siggs, of the School-house, Gressenhall, East Dereham, Norfolk. The designs by the following competitors were highly commended:—Mr. James Gardner, 32, Compton-buildings, Goswell-road; Mr. H. Fuller, Hobden-hall-cottage, Strand-on-the-Green, Chiswick; Miss E. A. Lilley, 7, Canterbury-road, Brixton; Miss Florence Farrington, Pensionnat de Saint Maur, Monaco; Mr. W. T. Wiegand, 9, Norroy-road, Putney.

Shop Seats.—The award of prizes in the Early Closing Association's Shop Seats Competition is announced, the judges being well-known Metropolitan drapers, Mr. William Owen (Westbourne-grove), Mr. M. H. Rackstraw (Islington), Mr. W. P. Jones (Holloway), Mr. J. Arthur Pyne (Lewisham), and Mr. Henry Arding (Clapham Junction). The board of management and assistants were represented by Messrs. Sale, Lees, and Harris. After a careful inspection of more than 200 models, the judges awarded the prize of ten guineas to Messrs. Sage and Co., of Gray's Inn-road, for the best seat adaptable to fixtures and occupying least room. Three prizes of £5 each were awarded to Messrs. H. G. Wells and Son, Hampden Gurney-street, for a seat adaptable to drawers and boxes; to the Lamson Store Service Co., Cheapside, for the "Ely" seat; to Mr. J. Llewellyn Morgan, of Cardiff, for a seat combining strength and economy.

An intermediate school for girls has just been opened at Carmarthen. It stands parallel with the Queen Elizabeth Grammar School for boys, and accommodates 120 girls, the chief rooms being the hall 50ft. by 22ft. 6in., lecture-room 20ft. by 19ft., and three class-rooms of about the same dimensions, workshop, laundry, gymnasium, and covered playground. The style adopted is Renaissance, and the buildings are of Llanelly stone, with Bath stone dressings.

For 39 years the Crystal Palace School of Art, Science, and Literature has been doing good work in providing artistic and scientific instruction for ladies, and the 40th session has just commenced. A more extensive suite of rooms than those previously occupied by the school has been set apart in the south wing for the students, who, on Saturday evening, took part in a *soirée musicale* in the new lecture-hall. The guests were received by Miss Annie Gibbon, the principal.

A Local Government Board inquiry was held at the workhouse, Stratton, north-west Cornwall, on Friday, by Major-General A. D. Crozier, R.E., and Dr. G. S. Buchanan, with regard to the application of the Rural District Council of Stratton for sanction to borrow £9,500 for works for the water supply of Bude and Stratton, from plans by Mr. Baldwin Latham, C.E.

Additions and improvements are being carried out during the Long Vacation to the fine old organ of the Temple Church. The reeds are being revoiced and supplied with new vibrators; a new orchestral oboe is being placed in the solo organ, and a new echo dulciana put in the choir organ. A considerable number of the original pipes remain in just as good a condition as they were over two hundred years ago. The work of renovating the organ is being carried out under the direction of Mr. F. Rothwell.

PROFESSIONAL AND TRADE SOCIETIES.

The Glasow Institute of Measurers.—The nineteenth annual meeting of this institute was held on Monday in the Building Trades Exchange, Glasgow, Mr. John Currie, president, in the chair. The annual report of the council was submitted, as also the treasurer's statement. The former showed that six new members had been admitted during the year, and that the number of members on the roll was now 55. The funds of the institute amount to £363 5s. 3d., an increase of £43 4s. 1d. over last year. The grant for prizes in the building construction classes of the Technical College was continued. The office-bearers for the ensuing year are:—President, Mr. John Currie; vice-president, Mr. John Muirhead; secretary and treasurer, Mr. Thomas N. Hill, F.S.I., 180, Hope-street; auditors of professional accounts, Messrs. John H. Ramsay and Colin Young; other members of council, Messrs. Jas. D. Herbertson, John Baxter, John H. Allan, Charles Marshall, James Cameron, G. B. Walker, and A. B. Watson.

The Master Painters' Convention. — The annual convention of the master painters of England was held at Hereford on Tuesday and was largely attended. This year's president is Mr. Vaughan, of Hereford, who delivered a presidential address dealing with the work and progress of the association and the position of decorative art in this country. He declared that in this respect England was still behind what she ought to be, and had yet much to learn. They were suffering from the neglect of early training. The younger members of their craft must receive a thorough tuition. They must encourage the spread of technical education. The more able a man was to execute artistic work, the more likely he was to have artistic work to do. To-day the public would have good work, not from any mere caprice, but simply from a love of the beautiful. Ruskin, in "The Two Paths," truthfully said:—"All art worthy of the name is the energy neither of the human body alone, nor the human soul alone, but of both united, one guiding the other. Good craftsmanship and work of the fingers joined with good emotion and work of the heart." They must study Nature, approach her with simplicity, and humbly learn her facts. Ruskin also said:—"Life without industry is guilt, and industry without art is brutality." Very true were his words. They as an association should do their utmost to improve and educate themselves and those about them, and good results were sure to follow. The president went on to explain that in the North of England and the Midlands the association was exceptionally strong, but they would like more members in the east, west, and south of England. Dealing with labour questions, he described strikes as a brutal way of settling disputes, and trusted that boards of conciliation would be the rule in future and not the exception. The convention extends over four days.

The Society of Architects.—The list of nominations for officers and council of this society for the ensuing session, just issued to members, shows that thirteen names are proposed for the twelve seats on the council, Mr. G. A. T. Middleton, A.R.I.B.A., who was the secretary during the first nine years of the history of the Society, being nominated in addition to the council's "house list," published by us in our issue of the 22nd ult., p. 366.

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The Public Works Loan Commissioners, in their twenty-fourth annual report, mention that during the last financial year they advanced sums amounting to £36,425 towards the cost of providing dwellings for the working-classes. The loans included amounts of £3,000 and £4,500 borrowed by building clubs in the county of Glamorgan.

The formal opening of new electricity works took place at Darwen on Friday. The works have been completed at a cost of £24,000, £6,000 of the borrowing powers having been reserved for probable extensions. The premises are erected on a portion of the Corporation's Cobin Bank estate, and cover an area of 1,110 square yards.

Mr. W. W. B. Beach, M.P., laid, on Wednesday, the foundation-stone of a new church which is being erected at a cost of £4,650 in the Malmesbury Park district of Bournemouth. Malmesbury Park is one of the poorest and most thickly populated districts of Bournemouth, and the new church is designed to accommodate 600 persons. The temporary church is to be converted into a parish church.

CHIPS.

An adjudication in bankruptcy has been made in the case of George Charles John Thew Soull, of Manningham, Bradford, late of Aberystwith, secretary of the National Association of Master Plasterers, lately licensed victualler.

A special sub-committee appointed by the tramways committee of the Manchester Corporation to consider and report upon the generation and distribution of electrical energy for the working of the tramways, report that they have carefully considered the report of Mr. C. H. Wordingham, the electrical engineer to the corporation, on the subject dated the April 6 last, and are fully convinced as to the advantages which will accrue to the citizens generally by the adoption of a combined station for traction and lighting purposes. The tramways committee have adopted the report, and recommend that tenders be invited for the overhead equipment of the tramways and the building of the rails.

On Sunday week the three-light east window, which has been filled with stained glass, was unveiled in Tremadoc Church, which has recently been completely restored. The subject in the upper part is the Baptism, the panels on either side containing angels, and the tracery above is filled with illustrations of angels. In the lower part there is a representation of the Last Supper, which runs through the three panels.

On the Feast of SS. Michael and All Angels a new chancel screen, which has been erected in the parish church of St. Luke's, Old Charlton, was dedicated by the rector. The screen, which is a memorial to the late Sir Vivian Majendie, chief inspector of explosives, is of carved oak in the Jacobean style. The designer is Mr. Gambier Parry.

Mr. W. A. Ducat held a Local Government Board inquiry in the Council Chamber, Harrogate, on Tuesday, to consider the application for sanction to borrow £8,000 for various improvements, the principal one being an item of £4,000 for addition to the Royal Pump-room.

The illness of the Marquis of Bute has produced a singular condition of things in the local building trade. Many houses have been built on the strength of an agreement of lease, but in order to sell or raise mortgages on one of these buildings the lease itself is necessary, signed by the Marquis. This his lordship is unable to do, and in the mean time Cardiff builders find themselves in an awkward predicament.

Highly gratifying progress is being made with the building of the nave of Truro Cathedral from Mr. Frank Pearson's plans. The columns are rising rapidly, and the walls can now be seen above the hoarding. Drawings and photographs of the cathedral are to be exhibited in the art loan collection of the Church Congress in the Imperial Institute, and an appeal for funds will be circulated.

The new pulpit in the Abbey Church, Sherborne, was dedicated on Wednesday by the Bishop of Salisbury.

The city council of Aberdeen resolved on Monday, by 16 to 13, to proceed with the scheme for widening Union Bridge in granite on the same lines as the existing structure, with this exception, that the wing walls, which are at present curved, will be straightened. Parliamentary powers will have to be obtained to carry out the work, and the cost of the improvement is estimated at £14,500.

A paste with which wall-paper can be attached to wood or masonry, adhering to it firmly in spite of dampness, is prepared, as usual, of rye flour, to which, however, are added, after the boiling, 8½ grammes of good linseed-oil varnish, and 8½ grammes of turpentine to every 500 grammes.

The Newton-in-Makerfield Urban District Council sanctioned on Monday a proposal to borrow a sum of £17,000 for waterworks purposes. A scheme was approved for providing two boreholes, with alternatives for the provision of tanks and duplicates to meet contingencies arising under the first section of the scheme, whilst the third section provides for reservoirs, &c. The total cost is estimated to be £22,000.

The Lord Mayor and Sheriffs attended, on Wednesday, the re-opening, after restoration, of the parish church of Clerkenwell (St. James's), which has been closed for general repairs for about six weeks. The large building, with its tall spire, forms a feature in the neighbourhood of Clerkenwell-green. Besides the general repairs and decorations, there are a wrought-iron screen, new mosaic pavement, some improvements on the organ, and electric lighting.

In St. Saviour's Church, Hockley, Birmingham, a stained-glass window, erected in memory of the Rev. Matthew Parker, the first incumbent, was dedicated on Sunday. It is a single-figure window, the subject being the Ascension, and is placed in the tower at the west end of the church. The artists were Messrs. Hardman, of Birmingham.

Mr. W. E. Riley, A.R.I.B.A., late assistant director of architectural and engineering works, was presented, on Wednesday in last week, with an address and a tea and coffee service of silver by his friends in the Works Department of the Admiralty at home and abroad, as a mark of their regard on his leaving the service to take up the appointment of superintending architect to the London County Council. The presentation was made by Lieut.-Colonel E. Raban, R.E., director of works.

Messrs. W. Potts and Sons, of Town Hall Buildings, Newcastle-on-Tyne, and Guildford-street, Leeds, have just completed a turret clock for the Newburn Working Men's Club, Northumberland, with illuminated dial and Lord Grimthorpe's gravity escapement.

The Chelsea Hospital for Women will be reopened to patients on Monday next. The operating theatre has been enlarged, and, with its adjacent rooms, brought into condition to fulfil all the requirements of modern surgery. The electric light has been installed, a new hot-water service and electric lift provided, and the hospital interior thoroughly cleaned and painted. The convalescent home at St. Leonard's-on-Sea is also being cleaned and painted, and will be reopened next week. An expenditure of £3,000 has been incurred in meeting these requirements, of which amount £1,500 has already been subscribed.

A banquet was given on Tuesday to Mr. Alfred East, A.R.A., at Kettering, his native town, in honour of his election to an Associateship of the Royal Academy. Mr. J. Alfred Gotch, F.S.A., F.R.I.B.A., occupied the chair, and among those present were Mr. T. Brock, R.A., Mr. Aston Webb, A.R.A., Mr. J. T. Nettleship, and Mr. T. C. Gotch. In his reply, Mr. East spoke of the great encouragement he received in his early days from the late Lord Leighton.

The historic church of King's Langley, Herts, was reopened after restoration last week. Mr. Gordon P. G. Hills, A.R.I.B.A., of London, was engaged as architect, and from his designs the church has been restored by Messrs. Christopher Miskin and Sons, of St. Alban's. The roof, which was slated, has been leaded up to the south aisle, the battlements and clerestory windows on both sides have been restored, the south clerestory entirely rebuilt, the gable cross at the east end of the nave restored, the battlements of the tower rebuilt, and the whole of the facing of the tower and the exterior of the south aisle repointed. The only new feature is found in the tie-beams in the nave roof.

The High Church of Inverness was reopened on Friday after having received considerable improvements, including a new ceiling and roof, and the restoration of a stained-glass window as a memorial of the late Lord Gordon of Drumcarn.

The Imperial Theatre in the High-street, Bordesley, Birmingham, was opened on Monday night. It has been built from plans by Messrs. Owen and Ward; the cost has been nearly £25,000, there are twelve exits, there is seating accommodation for 2,500 persons, the auditorium is 69ft. by 65ft., and the stage 69ft. by 40ft., and from gridiron to boards 50ft.

A new Church of England Soldiers' Institute has been built at Colchester, upon War Department land, upon a good site opposite the main entrance to Napier Lines, and is in character with the new infantry barracks there. Mr. C. E. Collins, of the R.E.C. establishment, designed the building. The opening ceremony was on Monday week.

On the Feast of St. Michael and All Angels, the Bishop of Lincoln dedicated three stained-glass windows in Heydour Church, near Grantham, to perpetuate the memory of the late Canon Deedes, vicar of the parish from 1856 to 1898. The east window contains a picture of the Crucifixion with attendant saints. In the small window on the north side of the sanctuary is represented St. Michael, the patron saint of the church; while the window on the south side contains figures of the Blessed Virgin and Child. Mr. C. E. Kempe designed the windows and executed the work, which harmonises with two fine windows in the north side dating from 1380.

On Friday evening, Mr. James Cobban, previous to his leaving Keith to take up his new duties as architect on the Haddo House estates of Lord Aberdeen, was entertained by the members of the local lodge of Freemasons and friends at a cake and wine banquet in the Commercial Hotel, and presented with a marble timepiece and purse of sovereigns. Mr. John Mitchell, R.W.M., made the presentation, and Mr. Cobban suitably acknowledged.

In the Falkirk Cemetery, on Saturday afternoon, there was unveiled a monument to the late Robert Buchanan (1835-75), a poet of a more than local reputation. The monument, which was erected by public subscription, is of silver-grey Creeton granite, 13ft. high, and is in the form of a broken column. The circular column stands on a double base.

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ILLUSTRATIONS.

"BRITANNIA WELCOMING THE NATIONS OF EUROPE."—ST. MARY'S CHURCH, SWANSEA.—THE PALACE OF JUSTICE, MUNICH.—EXHIBITION BUILDING AT VIENNA.—BRONZE DOOR, PRIVATE CHAPEL, WORCESTER.—SHORT PERIOD LUNATIC PAVILION, LEWISHAM.—FURNITURE FROM SOUTH KENSINGTON MUSEUM.—LONDON AND COUNTY BANK, CLACTON-ON-SEA.

Our Illustrations.

"THE NATIONS OF EUROPE WELCOMED BY BRITANNIA."

The subject of the principal window on the main staircase of the Hotel de l'Europe, Leicester-square, is "The Nations of Europe being Entertained as Guests by Britannia." The principal figure, that of Britannia, is seated in the third light and is glancing over the map of Europe, which she has in her hands, and at her feet is the lion, the emblem of England. The remainder of the window is composed of figures representing the countries of Europe, all in their national costume. In the first light are Spain, Portugal, Belgium, and France; in the second Germany, Norway, and Sweden; in the third Austria, Switzerland, and Denmark; and in the fourth Turkey, Greece, Italy, and Russia. In the foreground of the second light is the figure of Love welcoming all, and bearing a tablet containing the text, "Welcome the coming, speed the parting guest." The small panels over the main lights contain the flags of the countries represented, and are borne on staves held by the various figures, and at either end of the composition are the means of intercommunication, the steamship and locomotive. On the floor above are the four courses of dining, fish, flesh, fowl, and dessert, accompanied by music. On the upper floors the purposes of bed and bath rooms are emblematised by representations of Sleep and Night, poppies, the moon and stars, water lilies, iris, &c. The work was designed and executed by T. F. Curtis (Ward and Hughes), 67, Frith-street, Soho, London, and is a good example of careful and expressive drawing and composition. The work is full of elaborate and appropriate detail, while the decorative function of the windows has been duly kept in view. The painting is delicate and refined, and the colour is of an exceedingly harmonious and pleasing character.

PARISH CHURCH OF ST. MARY, SWANSEA.

The old church, removed to make way for the present imposing building illustrated herewith to-day, was of no special architectural interest, and it had a nave of mean and incongruous character with columns of a bastard Doric order. It was extremely inconvenient with galleries. The new church, designed by Sir Arthur Blomfield, A.R.A., has cost £23,000, and the builders were Messrs. Cornish and Gaymer, of North Walsham. The new nave is very nearly the same as that of the Mediæval church, and 12ft. more than that of the church which was pulled down as above described. It is considerably greater in length than either. All the seating is on the ground floor. The Herbert Chapel of the ancient church is preserved in the eastern part of the new fabric. The tower is entirely new, but it occupies a similar position as the old one, some of the details being reused. The style is Early English, of plain character, depending on good proportions rather than elaborations of detail. The walls are of limestone in random range work, with quoins and dressings of Doulting stone. Messrs. Haden, of Trowbridge, executed the heating. Messrs. Hart, Peard, and Co. did some of the metal-work, and the electric lighting has proved a great success. Care was taken to preserve the churchyard as well as any portions of historic interest in the old demolished building. Our reproductions are from photographs by Messrs. A. and G. Taylor, Swansea.

NEW PALACE OF JUSTICE, MUNICH.

(For description and further illustrations see p. 434, *ante.*).

DOOR, PRIVATE CHAPEL, WORCESTER.

This is an illustration of a door that has lately been fixed in a private chapel in Worcestershire. The groundwork is Italian walnut, and the inlay is holly, ebony, cherry, and mother-o'-pearl. The panels and handles are of bronze. The work was executed by Messrs. Graham and Banks, of 445, Oxford-street, from the designs and details of Mr. R. A. Briggs, F.R.I.B.A., architect, Norfolk-street, Strand, W.C.

THE SHORT PERIOD LUNATIC PAVILION, LEWISHAM.

This building has been erected on vacant ground, formerly a part of the workhouse property, adjoining the infirmary. It therefore stands between the two institutions, but is occupied as part of the infirmary, and is under the direct supervision of the medical superintendent and his staff. There are two entrances, one for each sex, and two small entrance-halls, each 16ft. 6in. by 10ft. The two halls are divided by a brick wall. Out of the halls are the entrances to the wards and padded rooms. The two wards are exactly alike, and measure 29ft. 6in. by 24ft. 4in. Each ward is designed for eight beds, giving a floor space of 89ft. per bed, and a cubical space of 1,068ft. each bed. This is considered to be none too much, as the wards have to be used both by day and night. The cubical space is calculated up to the height of 12ft., while the actual height of the wards is 14ft. 6in. The main drains of the infirmary being conveniently placed, the new building has been drained into the same. The large wards are heated by Shorland's stoves, set in the centre of the wards, and will be protected in front by stout locked iron railings. These stoves are designed with an air-chamber into which fresh air will be drawn, which, when heated, will travel along flues to ascend into the wards near the entrance doors. In addition to the stoves there is a small boiler set in a chamber in the centre of the building, which supplies heat to coils placed in the entrance-halls and corridors, and pipes in the padded rooms. The walls are well provided with windows, placed in opposite walls and reaching close to the ceilings, thus affording thorough cross ventilation. The windows are glazed in small squares, and the lower portions protected by stout plate-glass. The opening and closing arrangements are protected from interference by patients. Artificial light at present is by gas; but the building has been wired throughout for electric light by Messrs. Rasleigh Phipps. There is a convenient number of air inlets, and a foul air extraction flue in each ward, as well as a number of ventilating tubes, which afford a permanent means of escape for vitiated air. There is for each sex a padded room, which is octagonal, as this arrangement gives every facility of inspection without opening the doors. The padded rooms are supplied with two small windows, placed in a high position. There are also air inlets and exits. The padded rooms have been fitted up with indiarubber lining. There is an acute ward, 10ft. 9in. by 12ft. 3in., provided for the treatment of special cases. At the end of each ward is a group of offices, containing small kitchen, bathroom, lavatory, &c. Very strong ware fittings, with locked and protected taps, are used in these offices, and the walls are lined with glazed bricks. The sanitary offices are supplied with air inlets and exits besides the windows. These offices are cut off from the wards by a well-ventilated passage. The walls are built of stock bricks, and the bases and quoins in red brick. The roofs are simply framed in and covered with stout slates. The walls are plastered, and finished in adamant cement, which gives a hard surface for painting. The vertically-opening casements were made by Messrs. Burt and Potts, and the hinges for the padded-room doors by Messrs. Hart, Peard, and Co., from the architect's designs. The floors of the wards and bath-rooms are laid with pitch-pine wood blocks on a bed of cement concrete 9in. thick. The floors of the halls and offices are laid in plain 4in. red quarries, on concrete, as above. Specially-made angle-blocks form the junction between walls and floors. The joiners' work is of pitch-pine, varnished. All internal angles in plaster, wood, or brick are rounded. The whole of the work is perfectly simple in design, but is strong and well built. The architect is Mr. R. Williams, Lee; the clerk of works Mr. J. R. Williams; and the builder Mr. T. I. Barden, Maidstone.

CHAIRS FROM THE SOUTH KENSINGTON MUSEUM.

These Chairs date back to the 16th and 17th century; the two top sketches are good specimens of French work of that period (16th century). The Armchair is covered with a light foliage design, having panelled front and sides. The back is also panelled, with the addition of a coat of arms. It has a lift-up seat, which forms a cupboard or receptacle underneath. The Small Chair is carved with a similar design to the former; both are of walnut and oak. The English Chairs (17th century) are far more bold in treatment than the French specimens. Both have turned legs and backs, surmounted with bold scroll carving. One is of oak, the second of walnut, birch, and beech. Both examples probably come from York or Derbyshire.

LONDON AND COUNTY BANK, CLACTON-ON-SEA.

This building is just completed. The ground floor consists of the bank office, manager's room, waiting-room, and strong-rooms, &c.; the manager's residence is arranged over. The first floor consists of dining and drawing-rooms, kitchen, scullery, &c.; second floor four bedrooms, bath-room, &c.; third floor three bedrooms, cistern, and box-rooms. There are good separate basements for bank and residence. The fireproof flooring is by Messrs. Homan and Rodgers, and the strong-room doors and locks by Messrs. Hobbs, Hart, and Co. The cost is about £5,000, and the general contract has been carried out by Messrs. Everett and Sons, of Colchester; Mr. T. H. Baker, Clacton-on-Sea (of Baker and May, Colchester), is the architect, and Mr. Norman Demaid has acted as clerk of works.

CHIPS.

A new organ is in course of erection in the parish church of Newtown, Mont., at a cost of £600. The builders are Messrs. Peter Connacher and Sons, of Huddersfield.

The urban district council of Rushington, Lincolnshire, have adopted a scheme of water-supply for the district, prepared by Mr. Clare, C E., and estimated to cost £2,100.

Dr. Wiegand, who has lately been excavating for the German Government at Priene, will shortly commence similar operations at Miletus. It is expected that he will find there examples of Byzantine art.

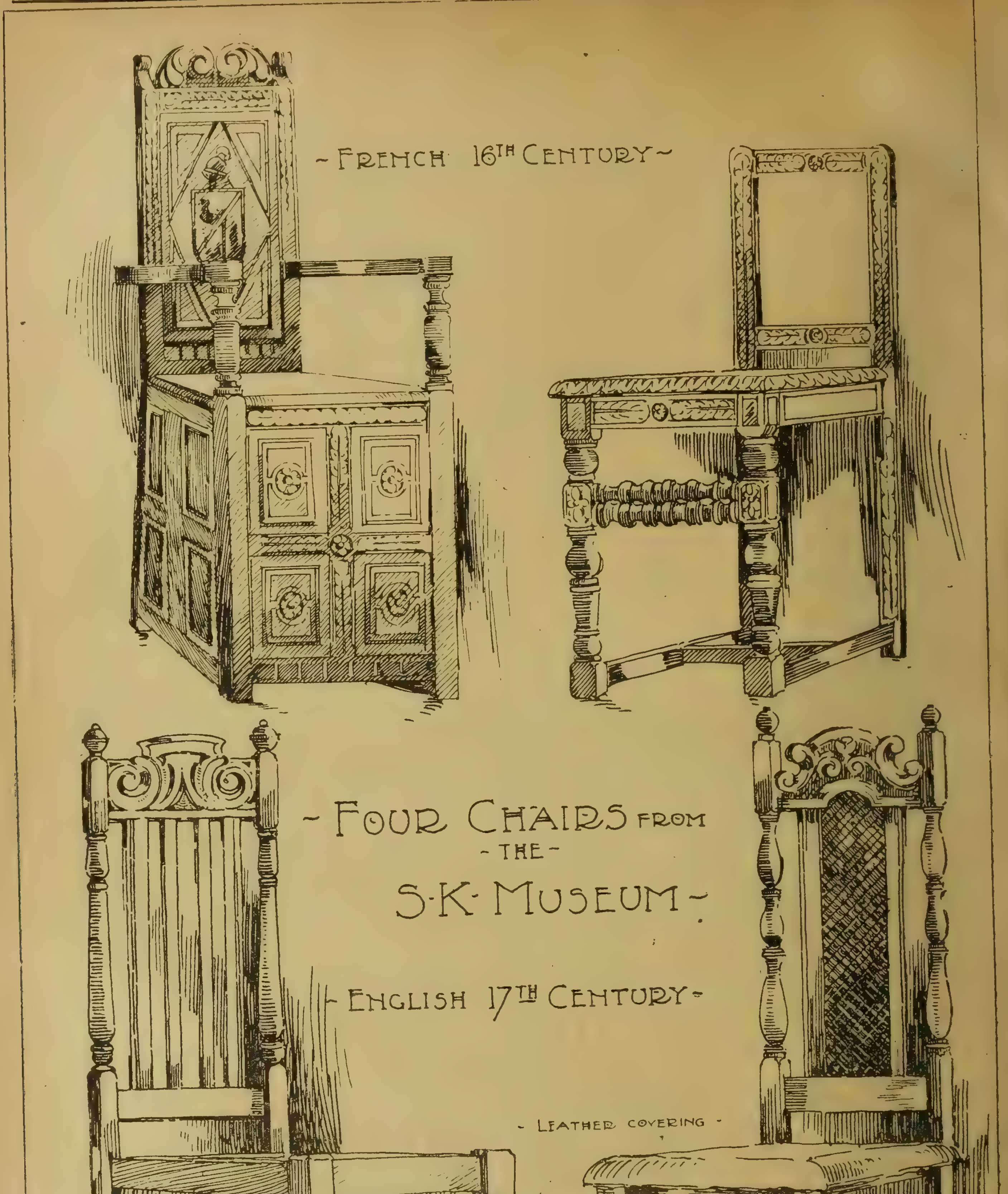
The Whitby Urban District Council received, at their last meeting, a letter from Messrs. Preece and Cardew, of London, reporting on the installation of the electric light, and inclosing revised estimates and plans. After a long discussion it was resolved that the scheme as formulated by Messrs. Preece and Cardew, involving a total expenditure of £26,000, should be adopted. It was further decided that the smaller scheme, involving an expenditure of £18,500, should be only proceeded with at first.

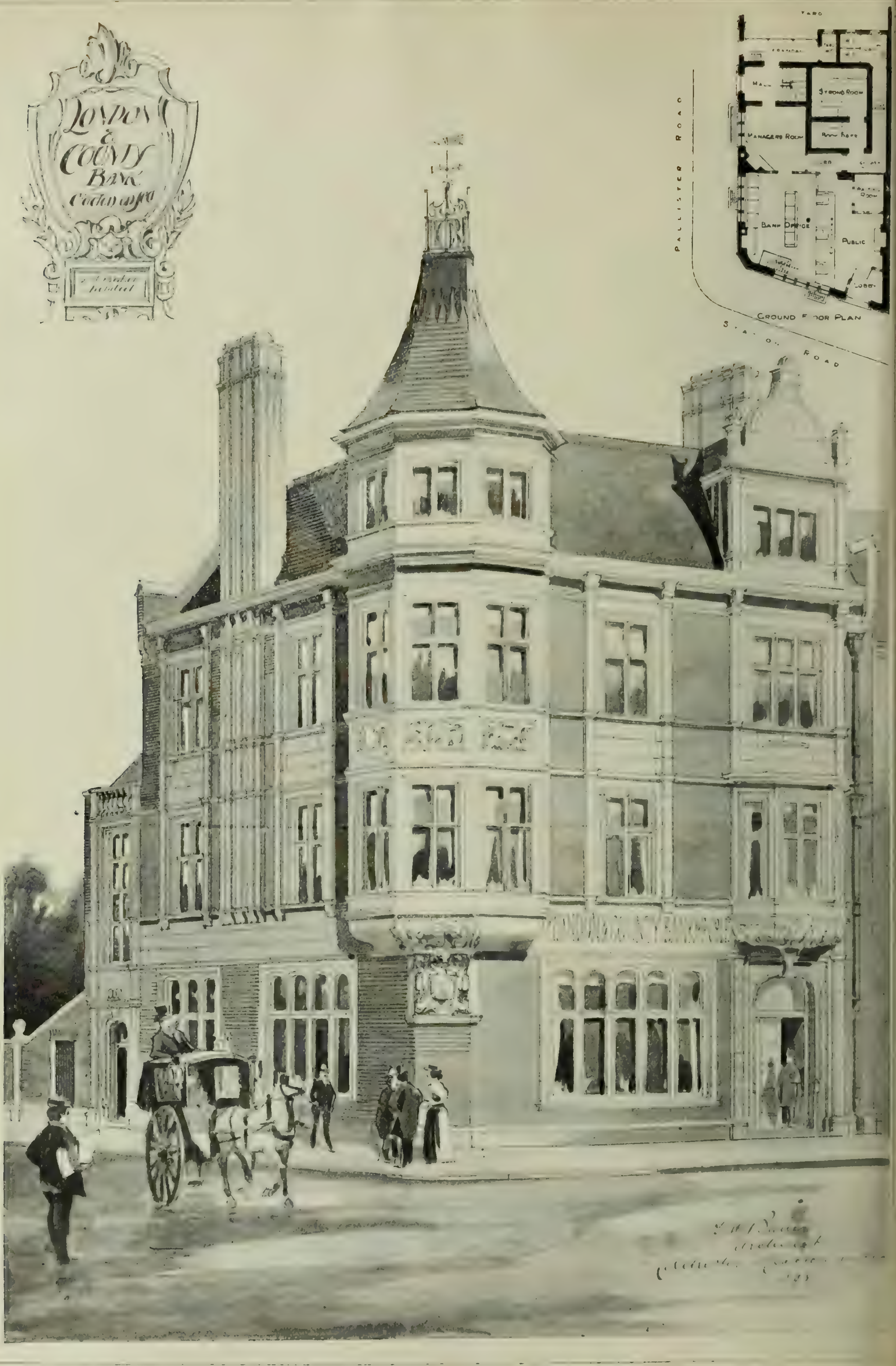
The parish church of Wembworthy is about to be reseated and renovated from plans by Mr. E. H. Harbottle, of Exeter.

The Duke of Connaught will lay, with Masonic ceremonial, in May next, the foundation-stone of the new school buildings for the Royal Masonic Institution for Boys, now in course of erection at Bushey, Herts.

A special committee of the town council of Bournemouth has been appointed to consider the desirability of erecting new municipal buildings.

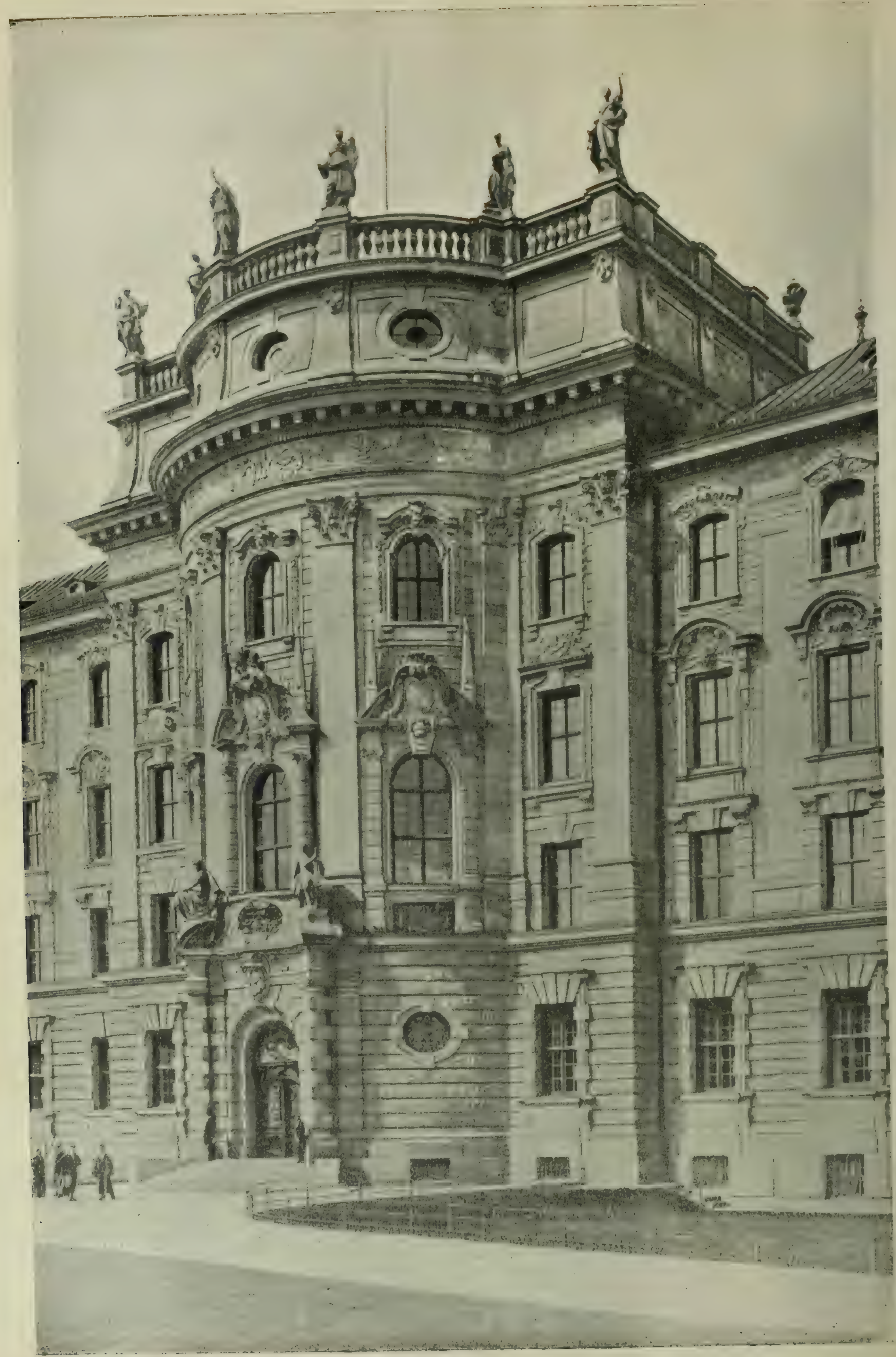
The work of replacing the Warren type girders in the bridges of the Bombay, Baroda, and Central India Railway, now nearing completion, will cost at least 44 lakhs of rupees, a reduction of one-fifth, however, on the original official estimates.


FRENCH 16TH CENTURY
FOUR CHAIRS FROM THE S·K· MUSEUM
ENGLISH 17TH CENTURY
LEATHER COVERING
W. J. Wells



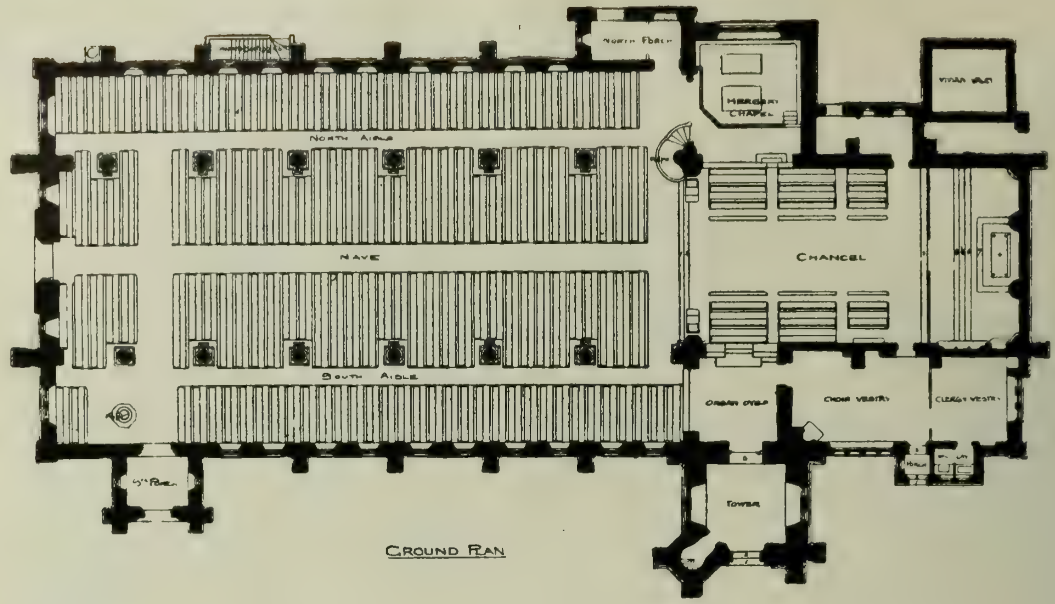
LONDON AND COUNTY BANK, CLACTON-ON-SEA.

L. H. BAKER, ARCHITECT.

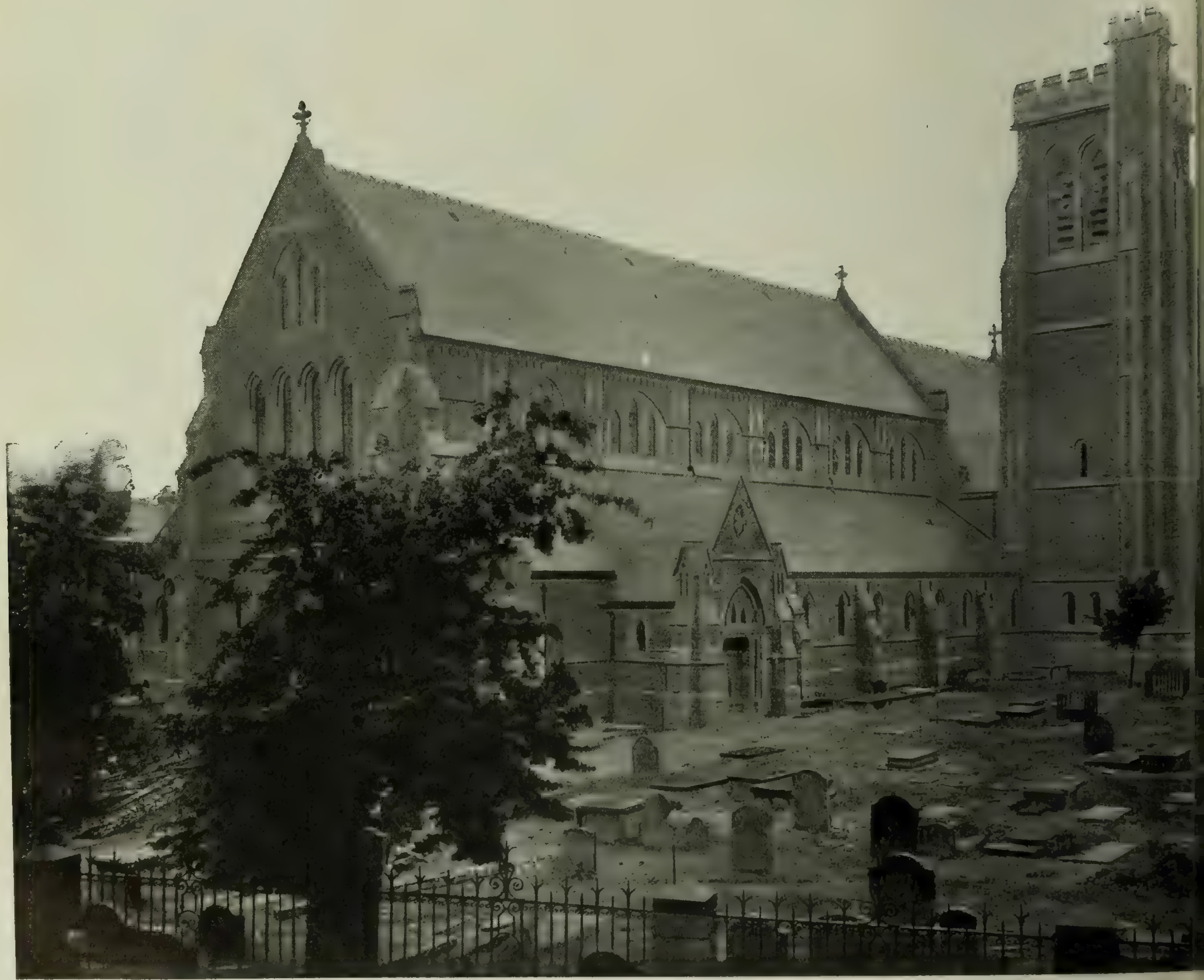


THE PALACE OF JUSTICE, MUNICH—EAST ENTRANCE.

FR. VON THIERSCH, ARCHITECT.

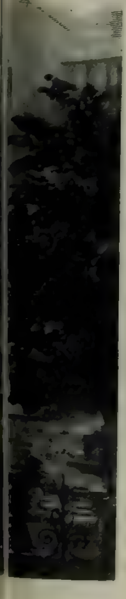


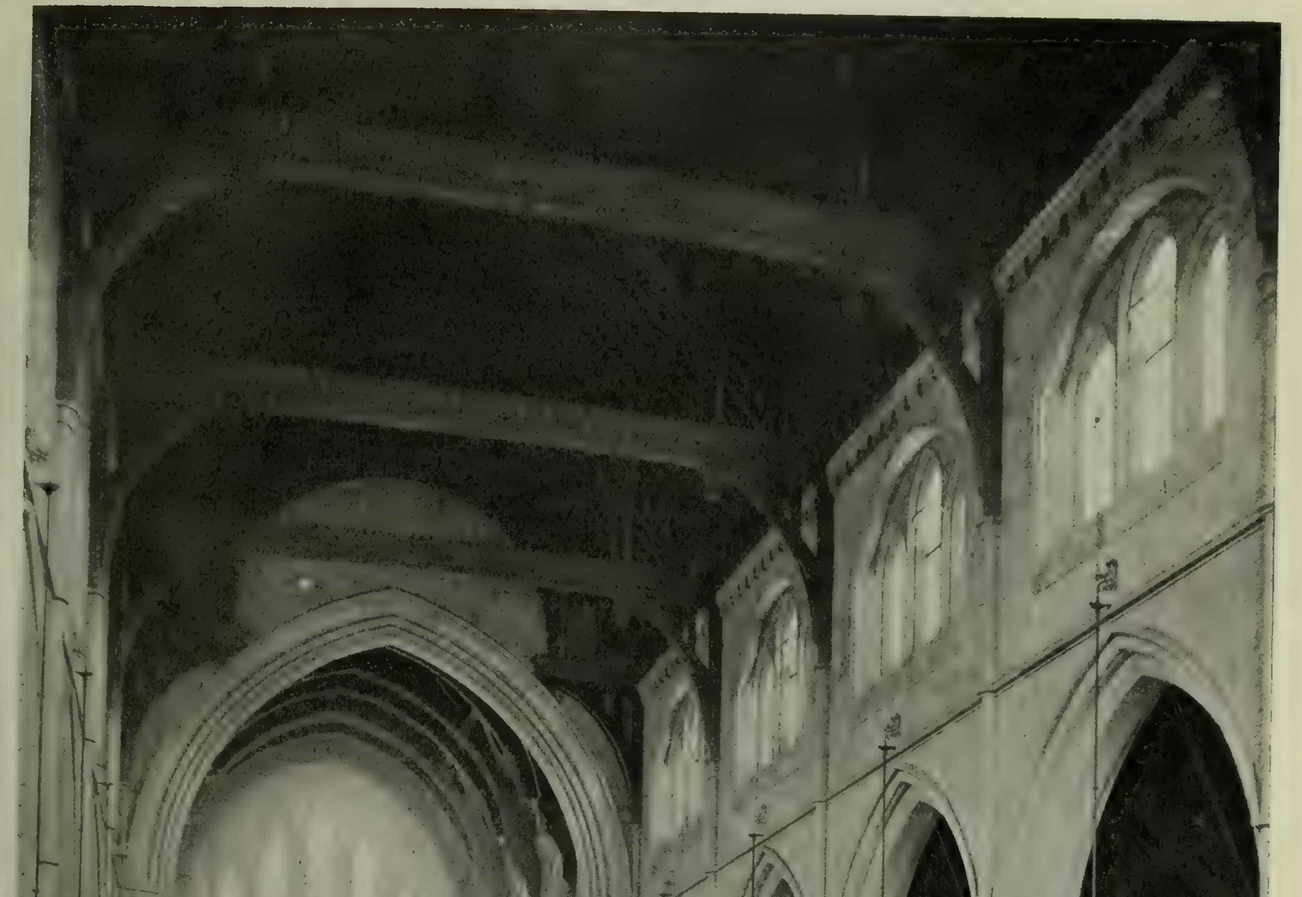
GROUND PLAN



ST. MARY'S C

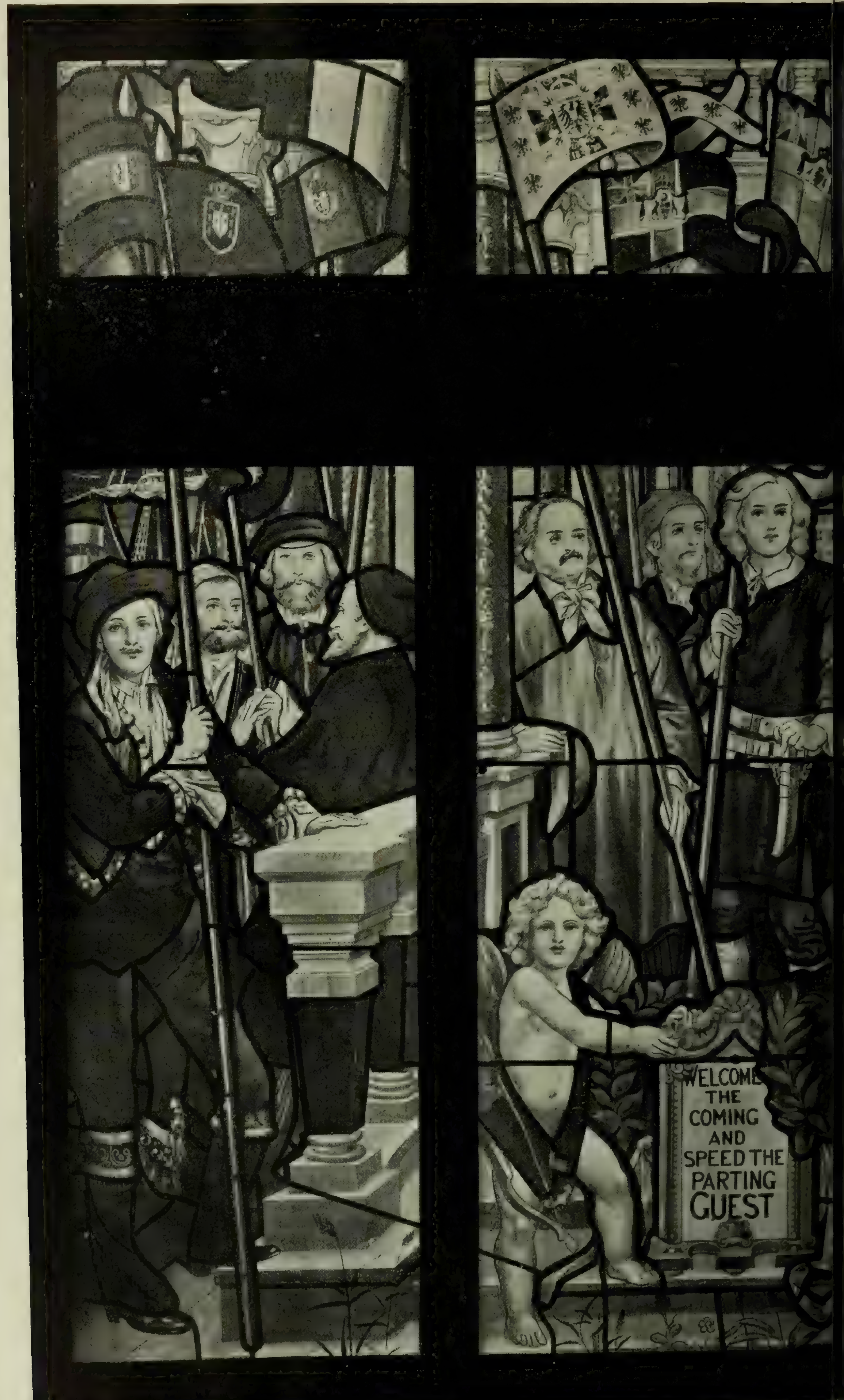
SIR ARTHUR BL



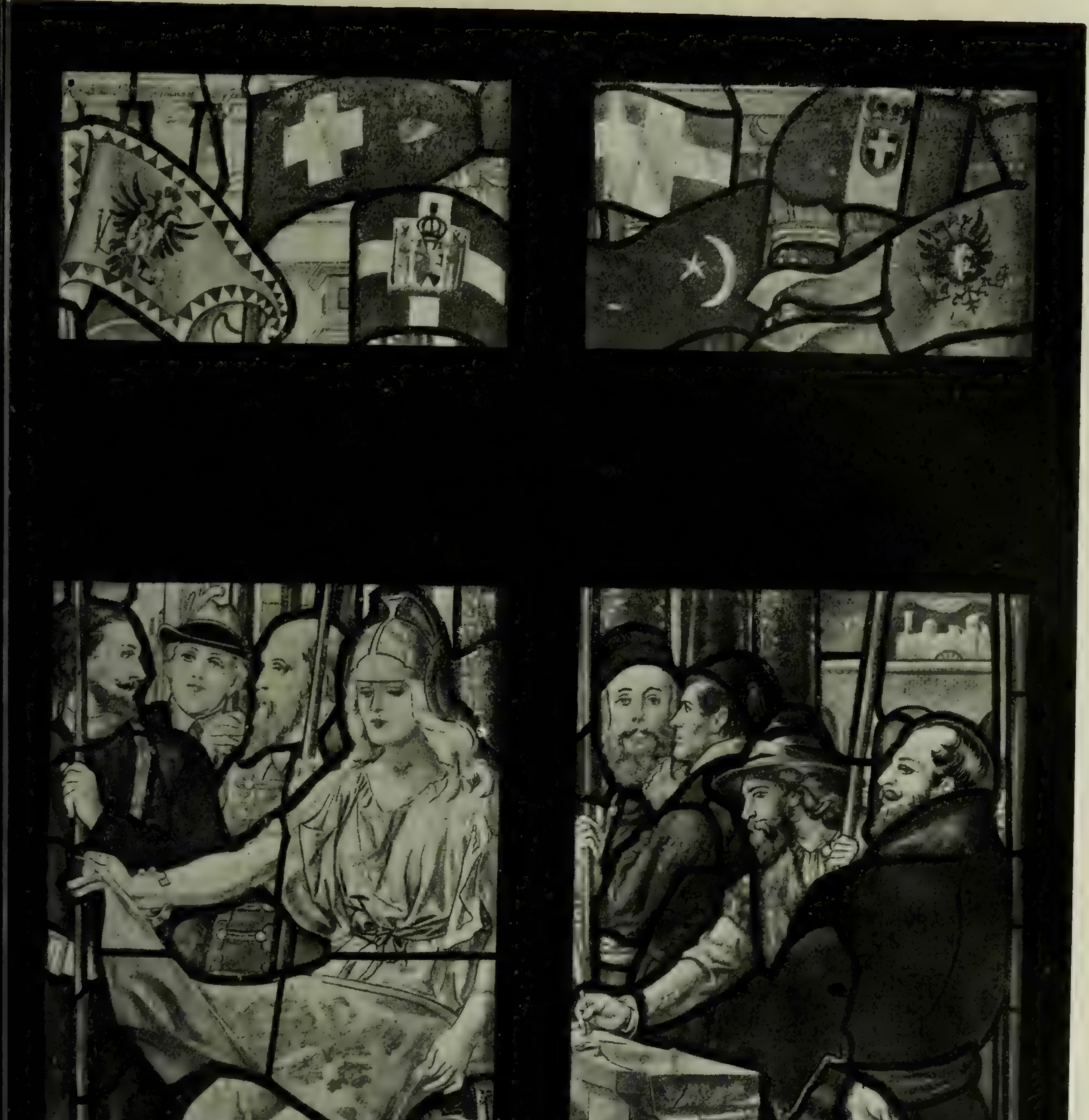


CH, SWANSEA.

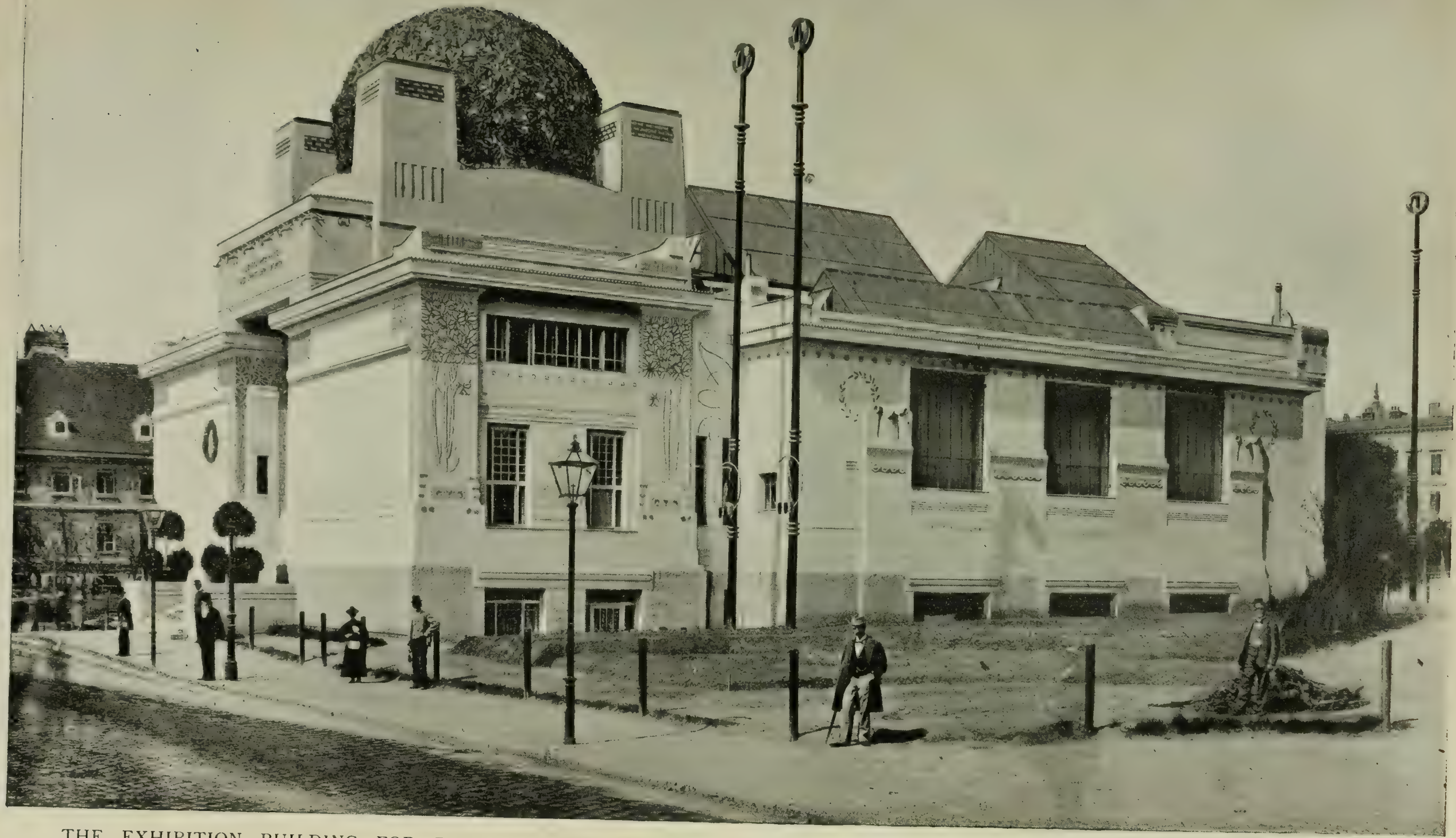
, A.R.A., ARCHITECT.



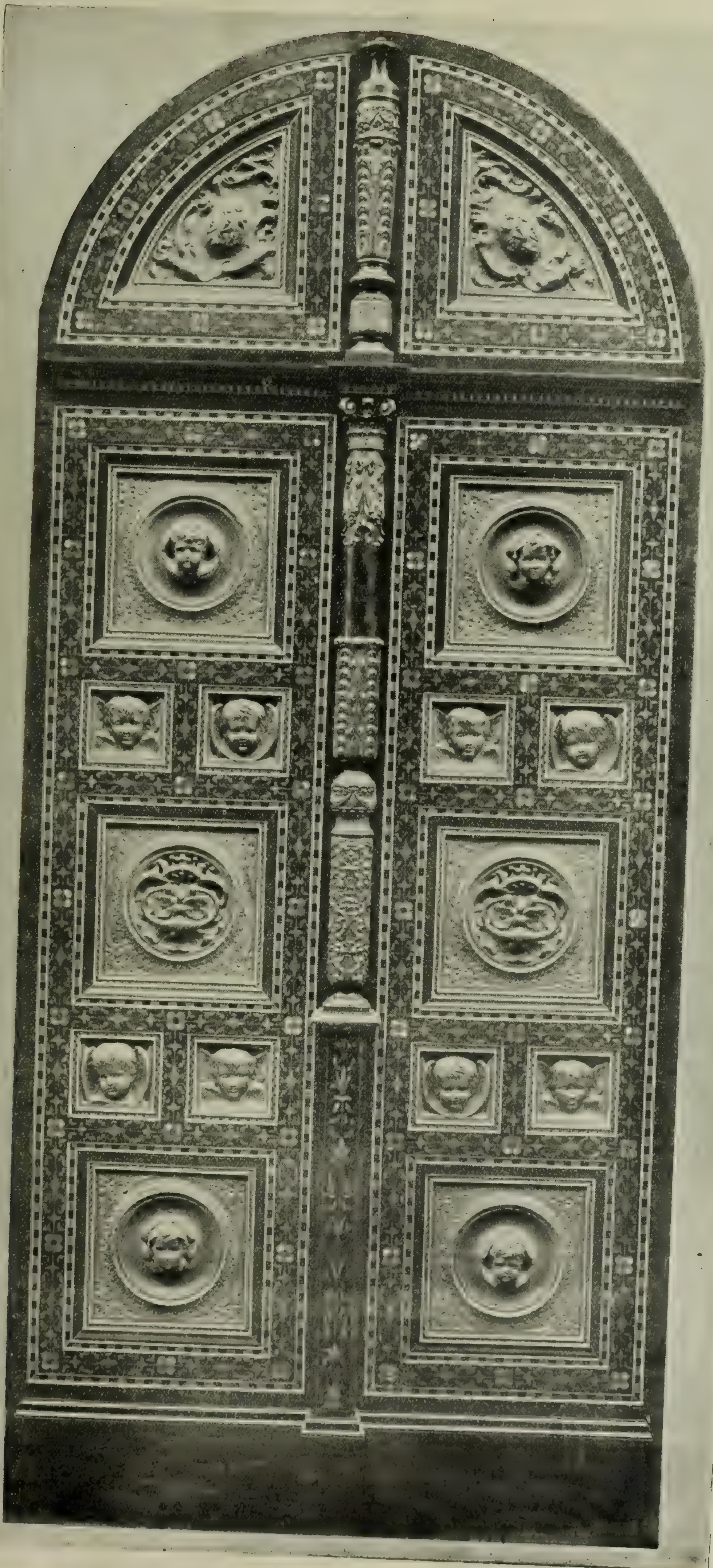
THE NATIONS OF EUROPE WELCOMED BY BRITANNIA. DESIGN
FOR THE GRAND HOTEL DE L'EUR



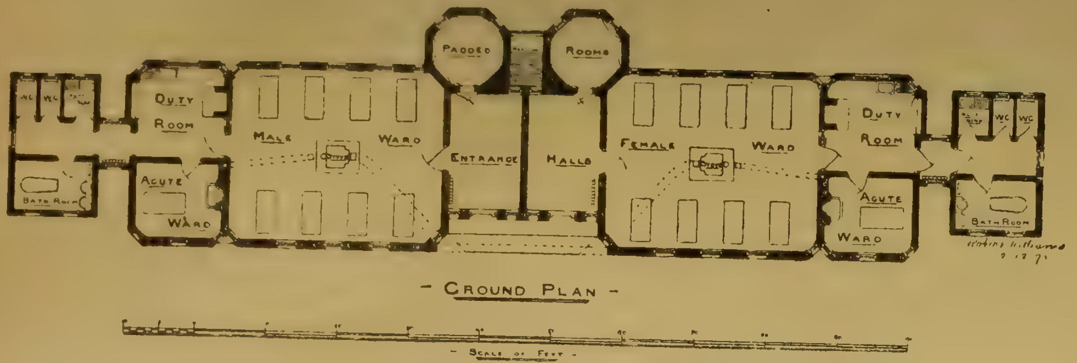
AND EXECUTED BY T. F. CURTIS (MESSRS. WARD AND HUGHES)
LEICESTER SQUARE.—WALTER EMDEN, ARCHITECT.



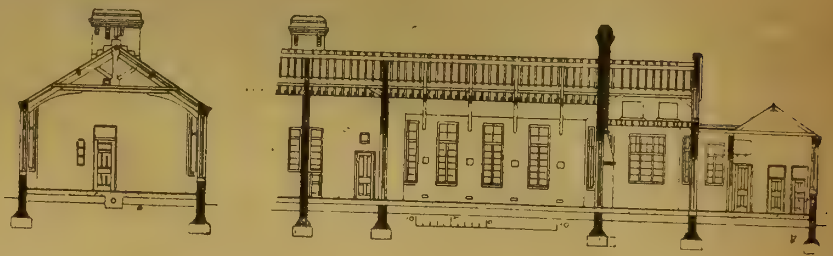
THE EXHIBITION BUILDING FOR PAINTING AND SCULPTURE, VIENNA, ERECTED BY THE ASSOCIATION OF SECESSIONIST ARTISTS OF AUSTRIA.—JOSEPH M. OLBRICH, ARCHITECT.

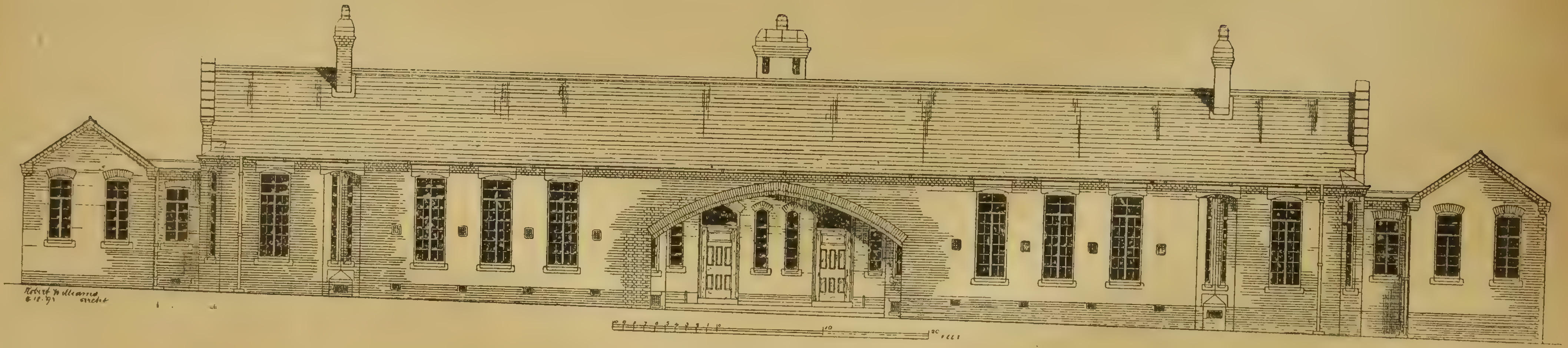


BRONZE DOOR PRIVATE CHAPEL WORCESTER



- Ground Plan -





- North Elevation -

THE SHORT-PERIOD LUNATIC PAVILION, LEWISHAM.—Robert Williams, F.R.I.B.A., *Architect.*

Correspondence.

A MISSTATEMENT CORRECTED.

To the Editor of the Building News.

Sir,—I am instructed by my clients (the Saxon Electrical Engineering Company, of Gervase-street, Old Kent-road) to state that their attention has been called to a very serious libel upon them, contained in a letter signed "Julius Sax and Co., Ltd.," and published in your issue of Sept. 15.

The members of my clients' firm, some of whom have been in the employ of Julius Sax and Co., Ltd., for eighteen or twenty years, all bear the highest character for capability and competence, and, in the majority of instances, overtures were made to them to join the staff of the firm, who informed them they were arranging to purchase the business, which proposals they declined to accept, and prior to the date of the resolution for the voluntary winding-up of the said Julius Sax and Co., Ltd., all the members of my clients' firm had either in writing or verbally given notice resigning their respective positions.

You will observe from the above facts that it is untrue to state :—

1. That the members of my clients' firm referred to were discharged by the said Julius Sax and Co., Ltd.

2. That the services of such of the former staff of Julius Sax and Co., Ltd., who proved themselves capable and competent, had been retained, and to describe my clients as servants whose services Julius Sax and Co., Ltd., had not thought it right in the interests of their company to retain.

3. That my clients' circular (a copy of which I send for your information) contained misleading statements.

You will, I am sure, appreciate the serious effect that a libel of this nature, published in a paper of such importance and wide circulation as your own, might have upon my clients' business, if allowed to pass uncontradicted.—I am, &c.

Henry F. Kite.

11, Queen Victoria-street, London, E.C.
October 6, 1899.

◆

The newly-restored memorial erected in Smithfield to the memory of the three martyrs—John Rogers, John Bradford, and John Philpott—was unveiled on Saturday afternoon by the Rev. M. E. Farmell, under the auspices of the Protestant Alliance, who have borne the expense. The memorial, which takes the form of a marble tablet, now reset and regilded, was first placed in position in 1870.

At the last meeting of the School Board for Wellingborough it was announced that Messrs. Brown and Fisher, the architects for Victoria school, whilst not admitting their liability, were prepared to pay £225 towards the cost of remedying certain defects which had occurred in that school as the result of chemical action setting up in the stag used for making the concrete. The offer was accepted.

Richmond Park, extending to 44 acres on the south side of the Clyde opposite the east end of Glasgow Green, was formally opened on Friday. The park, which was bought from Dixon's Trustees for £44,000, is being laid out partly as a cricket-field, and partly as a playground for children. A pond for waterfowl and a boating lake will also be provided. The park will be a great boon to the densely-populated districts of Hutchesontown, Dalmarnock, and Bridgeton.

The Earl of Dartmouth, Lord Lieutenant of Staffordshire, will open the new lock works and additional safe works built by Messrs. Chubb and Son (Limited) at Wolverhampton on Thursday in next week, Oct. 12.

The urban district council of Padstow are about to carry out a scheme of water supply, from plans by Messrs. Merryweather, at an estimated cost of £2,500.

The Light Railway Commissioners held a public inquiry at the Union Board-room, Museum-street, York, on Friday, as to the expediency of granting the application which had been made to them by the Escrick Rural District Council and the Riccall Rural District Council for an order to authorise the construction of a light railway between York and Selby. It is proposed to construct a single line of the ordinary gauge, the estimated cost being £72,000.

The Duke of Devonshire visited the village of New Mills, in Derbyshire, on Saturday afternoon, for the purpose of opening the extensions to the free library and the technical school. Each of the extensions has cost about £2,000.

Intercommunication.

QUESTIONS.

[11335.]—**Damp.**—The adjoining owner of a house took down his premises which were divided from my client's premises by a party-wall 4½in. thick. As no arrangement could be arrived at regarding this party-wall he left it intact, and built an independent wall abutting to the party-wall, and formed a gutter over. My client's property, which is old, was hitherto quite dry, but now the party-wall is so damp that wall-papers will not stick on it. Has my client any legal claim for damages, or can he insist on the damp being prevented from getting in between the walls ?—Northumbrian.

[11336.]—**Architect's Duty to Pupil.**—I am an architect and surveyor's pupil, and have been articled 20 months, and never once has the principal sat down to teach me anything. When I am sent out levelling I hold the staff, and read no levels. All I learn is obtained by attending evening classes. Is this the way to teach a pupil, or ought I to speak to the principal ?—Anxious.

[11337.]—**Wood-Block Floor.**—Will someone experienced in wood-block floor laying please inform me of the best method ? I should first concrete surface. What is best between concrete and the wood blocks, if for a good room ?—Old Subscriber.

REPLIES.

[12328.]—**Height of Buildings.**—Buildings erected on roads formed or laid out before August 7, 1862, can go to any height not exceeding 80ft. (see section 42); but on any roads laid out after that date the buildings must not exceed in height the width of the street. "P. Y. H." should study the London Building Act, 1894.—Henry Lovegrove.

[12329.]—**Special Fittings.**—It is well to provide a price for these articles, stating that such price is not prime cost; but if the architect can give correct particulars of required goods, he can make sure of getting them; but he must be very sure, so that the provision is really best.—H. L.

[12329.]—**Special Fittings.**—In reply to "A Country Practitioner," permit me to say that if he were to insert in his specification the full title of the fittings he is requiring, and also the numbers in the manufacturer's catalogue—if he can—and also the stipulation that they are to be obtained from that manufacturer, there would certainly be no fear of his being unable to obtain the articles he requires. He could also inform the manufacturer of these fittings for what he has specified him, and also through which channel the order will reach him, and in this case he would be doubly sure of obtaining the exact fittings he wishes for.—A. A. M., Blackheath.

[12330.]—**Classes and Lectures.**—I cannot give details in this column, but refer "A Student" to the Brown Book of the Architectural Association, in which he will find full details of classes, dates, and fees.—H. Lovegrove.

[12332]—**County Council Regulations.**—The plans must be in accordance with the L.C.C. regulations, and the plans approved, if a license for music and dancing is required. In any event, the plans must be approved as for a public building by the district surveyor, and a set of tracings deposited with him.—Henry Lovegrove.

[12333.]—**Raising Buildings.**—If the addition of a story interferes with the lights of adjoining owners, "Friendly Neighbour" should show his plans, and have an agreement drawn up giving formal consent, as, whether the injury is real or imaginary, an expensive lawsuit may result.—H. Lovegrove.

[12334.]—**Right of Support : Compensation.**—This is rather difficult to answer properly without seeing the buildings; but, generally, I may state that the claim should be made against the building owner, and not against the contractor. This is a proper matter for arbitration.—Henry Lovegrove.

◆

CHIPS.

The well-known painter Segantini died on Friday at his native town of Pontresina, in the Engadine.

The Bishop of Lincoln will dedicate to-morrow (Saturday) the memorial porch which has been erected over the finely-carved Norman doorway of the Abbey church of Sempringham in commemoration of the long reign of her Majesty, who is chief patron of the benefice and lay impropriator. The Crown, on behalf of the Queen, subscribed £100 towards the cost of the work.

The formal opening of the Ruthin County School for Girls took place on Friday. The school, which was formerly an old mansion, has undergone extensive alterations and enlargements, the work having been carried out by Mr. W. Wheeler, Denbigh, from plans prepared by Mr. James Hughes, of the same town. The premises were originally purchased for a sum of over £2,000.

The highest observatory in Germany is now completed. It is situated on the Schnee Koppe, the highest summit of the Silesian Mountains, at an elevation of 5,185ft. It will be managed as a Prussian State institute.

An institute in connection with St. Paul's Church, Prince's Park, Liverpool, was opened on Thursday in last week. It contains on the ground floor a gymnasium and kitchen, and on the floor above a large hall and four classrooms. Mr. W. E. Willink, of Liverpool, is the architect of the building, which has cost £3,600.

On Friday, the 22nd ult., the Roman Catholic Bishop of Birmingham consecrated the altar of the Sacred Heart in the Priory Church at Hawkesyard, near Rugby. The altar, which is by Messrs. Boulton and Wall, is in the Spode Chantry of the church.

A bust of James Bowman Lindsay, who is claimed to be the inventor of wireless telegraphy, is to be placed in the Victoria Art Galleries, Dundee. The bust is to be of white Carrara marble, and Mr. George Webster, Edinburgh, is to be the sculptor.

The foundation-stone of a new technical institution and free public library, about to be erected in Old Trafford under the auspices of the Stretford District Council, was laid on Thursday in last week by Sir Humphrey de Trafford. The new library will occupy a prominent position at the corner of Stretford-road and Northumberland-road. The building, which will be of brick, with terracotta facings, has been designed by Mr. John Bowden, architect, Manchester. It will provide, in addition to library and reading-room, a hall capable of holding about 600 people, as well as provision for technical instruction classes. The total cost, including furnishing, will be about £8,000. Mr. W. Thorpe, of Manchester, is the contractor.

Mr. James Arthur Anderson, till recently chief engineer in the Public Works Department of India, was accidentally drowned on Sept. 25 at Jalpaiguri, Northern Bengal.

Works are now in progress by which Somerset House, the Royal Courts of Justice, and the Bankruptcy Court Buildings in Carey-street, Lincoln's Inn, are being placed in direct communication with the headquarters of the Fire Brigade. Several fire-alarm posts are being erected in each of the above-named buildings for the purpose.

Adjudications in bankruptcy have been made in the cases of William Valentine Pugh, late Great College-street, Westminster, S.W., railway contractor, and of Frederick Thomas Randall, (described in the receiving order as Fred T. Randall), Portsdown-road, Maida Vale, W., a surveyor in the employment of the Vestry of St. Marylebone.

The public works committee of Dudley Town Council have issued a report, prepared by the borough surveyor, Mr. J. Gammage, dealing with the Netherton and Woodside drainage scheme. It states that the sewering of these districts would be connected to the intercepting sewers provided by the Stour Valley main drainage board. The length of the sewers proposed to be constructed is 20,982 yards at Netherton and 8,676 yards at Woodside, making a total length of 16¾in. The cost of the works he estimates at £15,000.

In response to a memorial signed by 300 London architects, the Building Act Committee of the London County Council have unanimously recommended the prohibition of illuminated designs and the preparation of by-laws to remedy the evil. It now remains for the Council to give effect to these suggestions.

A scheme of light railway development for the South Hams is on the *tapis*, which will, if constructed, provide a direct route from Plymouth to Dartmouth. It is to commence at the present terminus of the G.W.R. at Yealmpton, and proceed to Modbury, Aveton Gifford, and Kingsbridge, 13 miles. The second section would be from Kingsbridge through Frogmore, Chillington, Stokeham, Torcross, Slapton, Strete, and Stoke Fleming. A branch would connect Dartmouth with Churston Junction, and another is proposed to Totnes.

The decision of the Admiralty to have ordinary new works and extensions at the dockyard ports carried out by the director of works department, instead of, as hitherto, by private contract, has necessitated a considerable strengthening of the trades employed under the superintending engineer at Devonport Dockyard, for the construction of the new Admiralty offices at Mount Wise. Fifty men of various trades have been entered. The offices are to be completed by January next, when the Commander-in-Chief and his staff will be transferred to them. in order that the official residence and existing offices may be reconstructed.

Mr. John Lambert, of Ashley Down House, Ashleigh Hill, Bristol, builder, who died on June 5 last, bequeathed to the Sunday-school of the Albany-road Primitive Methodist Chapel £200, to the Bristol General Hospital and the Bristol Children's Hospital £250 each, to the Bristol Royal infirmary Hospital £500, and to the Bristol Asylum for the Blind £500. He also bequeathed to the Jubilee Commemoration Convalescent Home at Bristol £2,000 in trust to found therewith two beds to be named respectively the John Lambert and Sarah Lambert beds. Mr. Lambert left his residuary estate in trust as to £12,000, or such less sum as the residue might realise, for the Muller Orphan Houses at Ashley Down, and if the residue should exceed £12,000, then as to the surplus in equal shares for the Bristol Royal Infirmary, the Bristol General Hospital, and the Bristol Children's Hospital; but the gross value of the whole of the late Mr. Lambert's estate has been sworn at only £152.

LEGAL INTELLIGENCE.

Which is the Rear of a Building?—At the Haywards Heath Petty Sessions, on Monday, Richard Broughton Briggs, of Brighton, was summoned at the instance of the Haywards Heath Urban District Council for erecting a new domestic building without providing sufficient air-space, contrary to the council's by-laws, on August 28. Mr. H. Prince, solicitor, of Brighton, appeared for the prosecution, and Mr. S. T. Maynard, solicitor, was for the defence. Mr. Prince said the question would be purely as to facts, firstly. What is a domestic building? and, secondly, Which is the back or rear of a building? He defined the rear as "that part which is opposite the front." Defendant had erected a residence and some stabling, and he was instructed that the stabling was so built that the air-space which the by-laws provided should be given was not given. As to whether the stabling was a domestic building, he relied upon the definition contained in the by-laws. Was the stable at the rear or side? If it was at the rear it was a contravention of by-law 54. Lemuel Backshall, the council's surveyor, said he had seen the building called The Gables, with stables, &c., erected by defendant on the Lucastes estate. The entrance to The Gables faced east, and the coach-house door, stable door, and door of the cottage faced south, whilst the entrance to the stableyard was on the east side. The front of the residence, in his opinion, faced south. There was no building whatever on the north side, where Mr. Hind Smith's land abutted on defendant's property. Defendant's building was up to the verge of the boundary, so that there was no air-space between his building and Mr. Hind Smith's land. If the building had been 10ft. further south there would have been the requisite air-space. There was nothing to obstruct the air-space at what defendant called the back. The stabling was practically erected, the roof timbers being on. According to the by-laws defendant was compelled to have at least 10ft. air-space, but as a matter of fact there was not more than a few inches. By Mr. Maynard: Witness's definition of "front" was "the opposite side to the back." The entrances to the coach-house and stables faced the south, and he took that to be the front. It was not unusual to have entrances at the side. The two buildings were parallel. There was no by-law which compelled an entrance to be at the front. Unless they could fix upon the south side as the front, there was no infringement of the by-law, as air-space could be provided on every side except the north. The plans were disapproved of by the committee on August 28. He acquainted defendant with the committee's decision, and on September 4 he received a letter from defendant's surveyor defining the rear of the premises as on the west. By Mr. Prince: There would be no air-space at the rear of the cottage if the front was west, because of the stables, and if the front was east the stables would have no air-space because of the cottage. The magistrates having inspected the place, Mr. Maynard called witnesses for the defence. George Burstow said he was a surveyor, and assisted his father, who was a surveyor in Brighton. In July this year witness received instructions from Mr. Briggs to prepare plans for cottage and stabling proposed to be erected at The Gables, and such plans were duly prepared and sent in to Mr. Backshall. On the block plan witness marked the air-space at the side, because on the notice the option was given to have it at the rear or side. Witness considered the east was the front, because that was the main entrance. Samuel Denman, architect and surveyor, of Brighton, said he had inspected the site of the building and the plans sent in by Mr. Burstow. He considered that the plans complied with by-law 54 of the Hayward's Heath Council. In his opinion the front of the premises was that part first approached from the road. It was a point which frequently arose, and he looked on more than one occasion for a definition of the word "front." There was nothing about it in the by-laws, and he referred to "Webster's Dictionary," where he found it meant "the fore part of anything as applied to a building," and he did not think that there could be two questions about the fact that what he called the front was the fore part and the first approached. It was also parallel to what was called the front of the house. If the east side was considered the front of the house, he could not understand why that was not the front of the stable. There was no by-law that he knew of which stated that the doorway should be in the front, and at numbers of houses in Haywards Heath the doors were at the side. William Puttick, architect and surveyor, Brighton, said he had been in business about fifteen years. He had inspected the plans and by-laws, and he agreed with Mr. Denman's evidence in every detail. James John Smith, architect and surveyor, London, said he had had something like thirty years' experience. He had seen the situation of the premises, the plans, and the by-law, and he considered the approach on the east side of the building to be the front. He corroborated the evidence of the last two witnesses. Mr. Maynard impressed upon the Bench the fact that there was no definition of "rear" in the by-laws of the council. He contended that the "fore part" of the premises was that portion which they immediately approached as soon as they had passed through the entrance-gates, and that the "last in order"—the true rear—was on the west. There was no authority which said a man could not call what portion of his premises he liked his front. No one would suggest that the public health would in the slightest degree be prejudiced by the buildings remaining in their present position, and it was necessary, in order to obtain a conviction, to arbitrarily fix upon one side of the building as the front, sufficient air-space being provided on all the other sides. The Chairman said the question to be decided was whether defendant had infringed the by-laws or not. It was impossible for them to get away from the fact that there was a building, facing a long way, going from east to west, with all the approaches to the stables, house, &c., on the south side, and they considered the south side the front of the building. Therefore the north side was the back of the building. They held that the by-laws had been infringed, and imposed a fine of £1 and costs (£3 17s. altogether). Notice of appeal was given.

CHIPS.

In the case of Saville Dyson Crowther, of Linthwaite, near Huddersfield, builder and contractor, the order of discharge from bankruptcy has been suspended for two years ending August 3, 1901.

Messrs. Naylor Brothers, the contractors for the northern section of the new Dearne Valley Railway, which will also act as a feeder to the Hull and Barnsley Railway, have commenced operations at several points. The new section will take in the Houghton main and the Grunethorpe New Colliery, and will join the Hull and Barnsley line near Falkirk.

Mr. Isaac Morley, at one time city engineer of Pittsburg, died on Sept. 13, at the age of 76 years. He was born in Pittsburg, and was one of the leading engineers in the vicinity.

Preparations are being made for beginning the construction of a light railway through the Isle of Sheppey. The starting-point will be at Queenborough, on the London, Chatham, and Dover Railway, and the terminal station at Leysdown, with intermediate stations at Fowler's-corner (near the Half-way Houses), Minster, and Eastchurch. The new line will, it is expected, be completed in twelve months.

Extensive alterations are being made to the Chesterfield Grammar School, from the designs of Mr. W. H. Wagstaff, architect, Chesterfield, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

The Bridlington Licensing Bench on Saturday granted a license for a hotel to be called the Grand, and to be erected on the Beaconsfield Estate, overlooking the sea. The proposals include the erection of a theatre to accommodate 2,000 persons, and an arcade of shops, the total estimated cost being £100,000. The architects are Messrs. Mangnall and Littlewoods, of Manchester.

The Metropole Theatre at Devonport was reopened on Monday, after rebuilding and the instalment of the electric light. Mr. Samuel Roberts was the contractor, and the decorations are by the Fibrous Decoration Company, London.

The report of the arbitration in respect of property required for the improvement of Bragg's-lane, St. Philip's, has been forwarded to the city council of Bristol, the amount of the award being £1,950. The sum offered by the city was £1,750, and the claim was £4,000.

A new Roman Catholic church at Howth was recently opened. It is Romanesque in style, and built of Aughrim granite. Eventually a tower and spire rising to a height of 142ft. will be added. The architect was Mr. W. H. Byrne, of Dublin.

The Duke of Argyll has conveyed the ruins at Iona, including those of the historic cathedral, to a public trust in connection with the Church of Scotland. The result of this is that steps are at once to be taken to admit of the church being used for public worship.

After three adjourned discussions the city council of Norwich have finally approved the principle of the proposal for providing a new town-hall, and have, by 32 votes to 20 votes, instituted a committee to prepare a scheme forthwith for the erection of new municipal buildings, and submit it for the consideration of the council. An outlay of from £65,000 to £100,000 is spoken of by supporters of the project.

The rural district council of Brixworth, Northamptonshire, have decided to apply the provisions of the Housing of the Working Classes Act, 1890, to the village of Spratton.

Our Office Table.

We are surprised to hear that the Exeter City Council, upon whose body we, are sorry to learn, there are several local architects, last week decided to place the work of restoration of the front façade of their famous old Guildhall in the hands of Mr. Donald Cameron, their city engineer. Mr. Cameron, as the inventor of the septic system of drainage, is undoubtedly a man of the highest ability in his own profession, and has probably and deservedly a great future reputation before him; but that he is the proper person to intrust with the preservation of ancient buildings is hardly so apparent. Exeter's Guildhall was rebuilt on the site of a preceding one in A.D. 1466, the present front it is now proposed to restore having been erected in A.D. 1593. The step taken by the Exeter Council is, we venture to think, without many precedents.

The Trustees of the National Portrait Gallery have received, under the will of the late Lady Shelley, a bequest of the four following portraits: Percy Bysshe Shelley, the poet, painted at Rome in 1819 by Miss Amelia Curran; Mary Wollstonecraft Shelley, wife of the poet, painted in 1841 by R. Rothwell; William Godwin, painted by James Northcote, R.A.; Mary Wollstonecraft Godwin, painted about 1797 by John Opie, R.A. The Trustees have also received by bequest, under the will of the late C. Drury E. Fortnum, F.S.A., a portrait of Francis Haward, A.E., stipple engraver and Associate of the Royal Academy, painted by Ozias Humphry, R.A.

Eleven new pictures have lately been added to the small collection of oil paintings at the Whitworth Institute at Manchester. They have been "presented in memory of the late Sir Joseph Whitworth," and are hung in the central gallery, whence the water-colour drawings of scenes near Manchester have been removed to make room for them. The new pictures comprise "On the Thames," by Sir A. W. Callcott; "A Fishing Pinck hauling off shore, Katwyke, Holland," by E. W. Cooke; "Near Redhill, Surrey," by William Linnell; "Ennerdale Water," by J. B. Pyne; "Caversham," by Vicat Cole; "Macaulay in his Study," by E. M. Ward; "Fair Strathspey" and "Val d'Aosta," by J. M'Whirter, R.A.; "A Highland Spate," by Peter Graham, R.A.; "Barges on the Thames," a twilight effect, by Keeley Halswelle; and "Evensong," a moonlit view of a heath near the sea, with peasants trudging to church, by George H. Boughton, A.R.A.

The new fire brigade station in Bond-street, Ipswich, built from plans by Mr. Edward Buckham, borough surveyor, has been ready for occupation some six weeks or more; but, to the general surprise, no public notification of taking possession has been made known. As a matter of fact, a deadlock arose owing to a dispute between the builder, Mr. T. Parkington, and the watch committee of the corporation over the water fittings, with the result that Mr. Parkington refused to give up the keys. On Saturday morning, at seven o'clock, Superintendent Wheeler was instructed by the town clerk, on behalf of the watch committee, to make an entry to the new premises. This was accomplished in the presence of the town clerk and the clerk of the works. Superintendent Wheeler had to climb the gates, unfasten the bolts, take off the lock, and substitute a new one. Then a manual engine was placed on duty in the spacious engine-room, and the superintendent hoisted up the Union Jack on the hose-tower, proclaiming to the world that the building had been taken possession of. All the necessary fittings for the fire accoutrements have still to be fixed, but only a few more days' work will be necessary for everything to be completed.

Dr. E. Symes Thompson, Gresham Professor of Medicine, delivered, on Tuesday night, at Gresham College, the first of a course of four lectures on "Earth, Air, Water, and Insects in Relation to Disease." He treated of earth and disease, premising, however, that the heads into which, for convenience sake, he had divided his course of lectures were purely arbitrary, as earth, air, and water were so inseparably connected that it was difficult to assign limits to them in relation to disease. The power of various earths in storing and distributing disease was explained, and the capacity of different earths to afford a home for living organisms was illustrated by three instances

—virgin sand, peat, and earth from a sewage farm. The number of minute organisms in virgin sand per gramme was 8,000, in the peat the number was 500,000, while in the soil from a sewage farm the number of microbes was 100 millions. These organisms might be potent for good or for evil. Their importance for good was proved by the fact that pure distilled water, free from organic remains, was not found so potable as the water which contained organic remains. On the other hand, Lord Lister's invaluable discoveries had shown how potent for evil these minute bodies could be. It was therefore a matter of the highest importance to understand the nature of these organisms, so that disease might be prevented and the health of the community preserved. The lecturer proceeded to explain the value of mould as a purifier, and showed that whereas quicklime, which many people supposed to be a destroyer of putrefactive matters, had in reality the opposite effect upon them, mould was a most valuable agent in rendering such matters innocuous. Other points touched upon were the character of the tetanus microbe, and the relation of enteric fever and dysentery to the soil.

Through the kindness of Mr. James Melrose, J.P., of York, Mr. H. Platnauer has been enabled to make a valuable addition to the collection of ancient pottery in the York Museum, which is probably the most valuable in England. Mr. Platnauer was present when the men engaged in sinking the foundations of some new buildings in Davygate, in that city, discovered a tall jug of green glaze ware, with leaf-pattern handle, the date being probably about the 14th century. There are several specimens of this ware in the country, but what makes the recent find in York so valuable is that the jug is in perfect condition. It had been apparently accidentally dropped down a well, for when the men brought it up it was incased in mud, to which some pieces of old wood were adhering. Amongst the other discoveries during the excavations on the same site are fragments of Roman pottery, Samian ware, Roman metal, pins, &c.

It is not often, says the *Irish Builder*, a company is able to create a site on which the works can be carried on. This event has just occurred at Wexford. The Wexford Engineering Co. wished to set up business close to the town of Wexford; but a site was not available within a mile in any direction. It was therefore resolved to reclaim one from the sea. The Admiralty gave facilities to operate on the foreshore, and the Commissioners of Works in Ireland allowed the company to hire a powerful steam-dredger. About three months ago operations were commenced. Sand was dredged from the harbour to the extent of 1,600 tons daily. When laden the dredger steamed to the new site, where a large pipe connected with a centrifugal pump on shore was lowered into her hopper. The pump on the foreshore was then started, and the full load of sand with its accompanying water was discharged in less than forty minutes, and conveyed from the pump in shoots to any portion of the site required. The water running back to the harbour left the deposit of sand, which now forms a floor as firm as concrete, and thoroughly capable of supporting the buildings that will shortly be erected upon it. The site has an area of about eight acres, and will give many facilities for obtaining coal and materials and for the exportation of products.

Consent has now been obtained for the purchase of the manor house and grounds at Ealing for a public park. The Middlesex County Council have agreed to contribute £10,000 towards the purchase money of £40,000, and the Ealing Urban District Council, who will give liberally themselves, are appealing to other bodies for assistance in their scheme. The manor house, which is one of the best specimens of Inigo Jones's work, has for many years been in the possession of the Walpole family, and has lately been occupied by Miss Perceval, the last surviving daughter of the Prime Minister who was assassinated in the lobby of the House of Commons in 1812. The finely-wooded grounds are about thirty acres in extent. It is proposed to use the manor house as a public library, museum, picture gallery, and, possibly, also technical institute.

"Tit Bits" is no doubt an authority on things in general, but when it gets among matters architectural, it is apt to stumble. A week or two ago it replied to a query as to which church in England has, on its steeple, the most curious weathercock. The answer was—"St. Jude's, South Exeter, which church has on its steeple a jockey on a racehorse." As a matter of fact there is no church in or near Exeter dedicated to St. Jude, nor is there any such place as "South" Exeter. Further, none of the Exeter churches, save a couple of new ones on the outskirts, possess spires at all, and the suburban ones in question have no weathercocks. Once again, the representation of a jockey astride a horse surmounting a steeple would not be a weather-*cock* at all—it would be a vane!

The opinion of the city building inspector of Montreal regarding the volume of building enterprise in that city the present season is that the expenditure is larger this year than last. A less number of buildings is being constructed, but they are of a more costly and important character. The value of the new structures is estimated at about 3,000,000dols. (£600,000). The inspector declares that too many dwellings are being built, and that they are of too expensive a character. Sufficient provision is not made in the way of providing detached houses suitable for persons of moderate means, hence this class of persons is obliged to resort to boarding-houses, flats, and tenements.

In order to ascertain the permanence of colour of building stones, Professor W. B. Clark, Chief of the Geological Survey of Maryland, has tested rectangular specimens from 1in. to 1½in. in diameter, by first drying out all the contained moisture by means of a water bath at a temperature of 212° Fahr. After being allowed to cool, the specimens were weighed. They were then placed upon a set of glass shelves standing in a porcelain pan containing strong hydrochloric acid. An open bottle containing nitric acid and one containing hydrochloric acid and black oxide of manganese were placed close by, and the whole covered by a bell glass, forming an air-tight chamber. After a period of seven weeks the stones were removed and washed, and the change in colour, if any, was noted.

The Police Department of the corporation of Glasgow held a special meeting on Tuesday for the purpose of considering the building regulations, which a special committee has recently formulated. Lord Provost Richmond presided. In connection with the proposal to draw up a register and map of the streets of the city, Mr. Primrose, convener of the committee, explained that in the present register errors had been shown to exist, and there was no means by which they could be corrected. It contained the names of streets which had been obliterated years ago. The corporation sat for two hours, during which they considered in detail the provisions dealing with streets, including about 30 clauses out of the 133 of which the proposed Parliamentary Bill consists. The measure is framed on the lines of the Acts of 1866 and 1882 with such changes as experience has led the corporation to think desirable.

MEETINGS FOR THE ENSUING WEEK.

Tuesday.—Architectural Association. School of Design. Addresses by G. H. Fellowes Prynne, W. H. Seth-Smith, and Halsey Ricardo. 56, Great Marlborough-street, W. 7.30 p.m.

Friday.—Glasgow Technical College Architectural Craftsmen's Society. Opening Meeting. Address on "Mild Steel," by Professor Sexton, F.C.S. 8 p.m.

Architectural Association. Discussion Section. Debate on "The Registration of Architects," to be opened by G. A. T. Middleton and A. R. Jemmett. 56, Great Marlborough-street. 7 p.m.

THE ARCHITECTURAL ASSOCIATION.

The COURSES of LECTURES and CLASSES COMMENCE on MONDAY, October 9th, at 6.30 p.m. A Pamphlet, giving full information, may be obtained of the SECRETARY, at 56, Great Marlborough-street, W.

G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

Paisley's new technical college was opened on Monday without any ceremonial function, and the secretary reported that the enrolments, which had been proceeding during the week, showed fully 500 over the classes, or between 300 and 400 individual students.

There was an encouraging increase in the amount of business transacted at the London Auction Mart during last week—a fact which announces the approach of the opening of the autumn season. The lots offered were, however, of no special interest, being almost entirely composed of brick-and-mortar investments of the ordinary kind. The total of the week's sales was £90,751, as against £81,970 for the corresponding week last year.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 0 0	,,	8 10 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£8 15 0	to	£9 15 0
Cast-Iron Stanchions	8 15 0	,,	9 15 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 15 0	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	60p.c.
Water-Tubes	55
Steam-Tubes	50
Galvanised Gas-Tubes	45
Galvanised Water-Tubes	40
Galvanised Steam-Tubes	35

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	16 15 0	,,	17 15 0
Pig Lead, in 1cwt. pigs	16 0 0	,,	17 0 0
Lead Shot, in 28lb. bags	19 12 6	,,	20 12 6
Copper Sheets, sheathing and rods	92 0 0	,,	92 10 0
Copper, British Cake and Ingot	79 0 0	,,	80 0 0
Tin, Straits	144 15 0	,,	150 15 0
Do., English Ingots	153 0 0	,,	154 0 0
Spelter, Silesian	22 2 6	,,	22 7 6

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	5 0 0	,,	6 15 0
,, Oak	,, ...	4 2 6	,,	6 15 0
,, Birch	,, ...	2 12 6	,,	4 10 0
,, Elm	,, ...	4 12 6	,,	5 5 0
,, Ash	,, ...	3 15 0	,,	4 15 0
Dantsic and Memel Oak	,, ...	3 0 0	,,	4 0 0
Fir	,, ...	2 5 0	,,	3 5 0
Wainscot, Riga p. log	,, ...	3 2 6	,,	5 10 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 15 0	to	£27 5 0
,, 2nd	15 15 0	,,	19 0 0
,, 3rd	9 15 0	,,	11 5 0
Canada Spruce, 1st	9 0 0	,,	11 0 0
,, 2nd and 3rd	7 10 0	,,	8 15 0
New Brunswick	7 10 0	,,	8 5 0
Riga	8 5 0	,,	9 5 0
St. Petersburg	10 0 0	,,	16 10 0
Swedish	10 0 0	,,	17 0 0
Finland	9 10 0	,,	10 10 0
White Sea	11 15 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 11 0	,,	£0 15 6
2nd ditto	0 7 0	,,	0 11 3
Other qualities	0 5 3	,,	0 8 9
Staves, per standard M:—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£21 12 6	to	£22 2 6
Rapeseed, English pale	,, ...	24 10 0	,,	24 15 0
Do., brown	,, ...	22 5 0	,,	23 5 0
Cottonseed, refined	,, ...	18 5 0	,,	20 0 0
Olive, Spanish	,, ...	82 0 0	,,	82 10 0
Seal, pale	,, ...	18 10 0	,,	19 0 0
Cocoanut, Cochin	,, ...	29 5 0	,,	29 10 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	23 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6¼	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

LIST OF COMPETITIONS OPEN.

Paignton—Pavilion and Stand for 400 Persons (limit £800)	£15, £5	G. Barnston, Clerk, Town Hall, Paignton	Oct. 16
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	" 17
Elland—Baths on South House Estate	No first; £20, £10	The Clerk, U.D. Council Offices, Elland	" 28
Horley—Fire-Engine Station	£10	Robert L. Love, Solicitor, Clerk to Parish Council, Horley, Surrey	Nov. 1
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	" 30
Bury, Lancs—Infectious Diseases Hospital, Bolton-road (limit £12,500; Assessor)	£100, £50, £25	The Borough Engineer, Corporation Offices, Bank-street, Bury	Dec. 1
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—
Leicester—Workhouse Infirmary (360 patients) and Imbeciles' Home (150 patients)	£100, £50, £25	The Clerk to Board of Guardians, Leicester	—

LIST OF TENDERS OPEN.

BUILDINGS.

Sale—Lodge, &c., at Recreation Ground	Urban District Council	A. G. M'Blath, A.M.I.C.E., 2, Montagu-road, Sale	Oct. 7
Bridlington—Additions to Stable, &c., Oliver's-lane	J. Burrell	Samuel Dyer, Architect, Bridlington Quay	" 7
Whitchurch—Repairs at Vicarage and Glebe		The Vicarage, Whitchurch, Devon	" 7
Chopwell—Schools (550) and Boundary Walls	School Board	J. Oswald, F.R.I.B.A., 33, Mosley-street, Newcastle	" 7
Workington—Six Cottages and Dwelling-House at Barepot	David Lewis	W. G. Scott and Co., Architects, Victoria Buildings, Workington	" 7
Long Eaton—Eighteen Houses		E. H. Child, A.R.I.B.A., Architect, Sandiacre	" 7
Cardiff—Roath Branch Library	Corporation	Teather and Wilson, Architects, Queen-street, Cardiff	" 7
Limerick—Labourers' Shelter at Mount Kennett	Harbour Commissioners	The Harbour Engineer, Limerick	" 7
Horsham—Additions to 7A, North-street		C. H. Burstow, F.I.A.S., Architect, 6, West-street, Horsham	" 7
Ballinasloe—Slating and Plastering Work (Three Years)	District Asylum Committee	J. Young, Asylum Clerk, Ballinasloe, Ireland	" 7
Cockermouth—Repairs to Tiling in All Saints' Church	Churchwardens	C. H. Harrison, Cockermouth	" 7
Stainland—Three Houses, Dog-lane		C. F. L. Horsfall and Son, Archts., Lord-st. Chambers, Halifax	" 7
Burnley—Extension of Workhouse	Guardians	S. Keighley, Architect, Nicholas-street, Burnley	" 9
Exmouth—Alterations and Additions at 32, The Strand	Mrs. T. Radford	Ernest E. Ellis, Architect, Market-street, Exmouth	" 9
Pentre—Additions to Cwmclydach Board School	Ystradyfodwg School Board	Jacob Rees, Architect, Hillside Cottage, Pentre	" 9
Yardsley—Public Offices, &c., Stratford-road, Sparkhill	Rural District Council	Arthur Harrison, Architect, 88, Colmore-road, Birmingham	" 9
Crook—Minister's Residence	Primitive Methodist Society	F. H. Livesey, Architect, N.E. Bank Chambers, Bishop Auckland	" 9
Penistone—Chemical Laboratory and Classrooms	Grammar School Governors	Jno. M. Greaves, Town-end, Thurlstone	" 9
Birkenhead—Electricity Generating Station, New Chester-road	Corporation	Chas. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	" 10
Dublin—Central Bridewell and Offices, Chancery-street		H. Williams, Secretary, Office of Public Works, Dublin	" 10
West Kensington—Post-Office Savings Bank	H.M. Commissioners of Works	J. Tanner, H.M. Office of Works, Storey's Gate, S.W.	" 10
Membury, Devon—Skittle Alley, Red Lion Inn	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	" 10
Harbertonford—Chapel	P.M. Connexion Trustees	J. Barrons, Weir View, Totnes, Devon	" 10
Barking—Greenhouse at Recreation-Ground	Urban District Council	C. J. Dawson, F.R.I.B.A., Public Offices, Barking	" 10
Exmouth—Two Houses and Shops		Philip Kerley, Architect, Exmouth	" 10
Ystrad—Pavilion Blocks, Boundary Walls, &c.	Rhondda Urban District Council	W. D. Morgan, Architect, 23, St. Mary-street, Cardiff	" 10
Portslade—Engine and Boiler Houses, &c., at Pumping Station	Brighton Town Council	Francis J. Tillstone, Town Clerk, Town Hall, Brighton	" 10
Chard—Repairs and Alterations to Malthouse	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	" 10
Elland—Engine-Room, Chimney, &c., at Cross Mill		W. Clement Williams, Architect, 29, Southgate, Halifax	" 11
London, N.E.—Extension of Hackney Public Baths	Hackney Vestry	Gordon, Lowther, and Gunton, Architects, Bloomsfield-street, E.C.	" 11
Workington—Additions to Hospital on Merchants Quay	Port Sanitary Authority	Charles W. Eaglesfield, Architect, Falcon-street, Workington	" 11
Bishop Sutton—Infant School		Maynard Froud, Architect, 1, St. Stephen's-street, Bristol	" 11
Tooting Bec Common—Asylum	Metropolitan Asylums Board	A. and C. Harston, Architects, 15, Leadenhall-street, E.C.	" 11
North Broomhill—Miners' Club		J. McCloud, Store-row, Acklington	" 11
Devonport—Parochial Offices at Camel's Head	Guardians of the Poor	H. G. Luff, Architect, 64, Chapel-street, Devonport	" 11
Kanturk—Repairs at Boherboy Dispensary Residence		The Clerk's Office, Workhouse, Kanturk	" 11
Ashton-in-Makerfield—Additions to Offices, Bryn-street	Urban District Council	J. W. Liversedge, Surveyor, Council Offices, Ashton-in-Makerfield	" 11
Ilford—Downshall School (1,540)	School Board	C. J. Dawson, F.R.I.B.A., 7, Bank Buildings, Ilford	" 12
Roath, Cardiff—Alterations and Renovations to Baptist Chapel		Lewis and Pocock, Solicitors, 13, Duke-street, Cardiff	" 12
South Normanton—Girls' School	School Board	R. C. and E. R. Sutton, Architects, Angel-row, Nottingham	" 12
Horsham—Two Houses at Denne-parade		William Buck, Architect, Horsham	" 12
Wolverhampton—Workhouse, Infirmary, &c., at New Cross	Guardians	Arthur Marshall, A.R.I.B.A., King-street, Nottingham	" 12
Ryton—Two Cottages at Woodside		Ed. Hawkins, Woodside House, Ryton	" 12
Kingston-upon-Thames—Pulling Down Buildings, Thames-st.	G. & C. & E. Nuthall and Sons, Ltd.	Carter and Ashworth, Architects, 86, Eden-st., Kingston-on-Thames	" 12
Belfast—Store, House, and Boundary Wall, Ormeau-avenue	Gas Committee	The Gas Office, 29, Queen-street, Belfast	" 12
Skerton—St. Joseph's Church		The Rev. P. O'Bryen, Slyne-road, Skerton, Lancaster	" 13
Leicester—Cemetery Buildings on Gilroes Estate, Groby-road	Corporation	Goddard and Co., Architects, 6, Market-street, Leicester	" 13
Guildford—Reslating Portion of Children's Quarters, &c.	Guardians	Peak and Lunn, Architects, 36, High-street, Guildford	" 13
Huddersfield—Generating Station, Longroyd Bridge	Corporation	The Borough Engineer, 1, Peel-street, Huddersfield	" 13
Bootham—New Gymnasium Wing, &c., at Friends' Boys' School		W. H. Thorpe, F.R.I.B.A., Architect, 61, Albion-street, Leeds	" 14
Winchcombe—Police Station	Gloucester Joint Committee	M. H. Medland, F.R.I.B.A., 15, Clarence-street, Gloucester	" 14
Yeovil—Repairs to Cottages in the Avenue	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	" 14
Watford—School (1,072), Judge-street and Ridge-street	School Board	W. H. Syme, F.R.I.B.A., 4, High-street, Watford	" 14
Bootham—Science Block, &c., at Friends' Boys' School		W. H. Thorpe, F.R.I.B.A., Architect, 61, Albion-street, Leeds	" 14
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, The Broadway, Wimbledon	" 16
Bickington—Dwelling-House at Water	J. Honywill	S. Segar, F.I.A.S., Architect, Union-street, Newton Abbot	" 16
Mellis—Additional Buildings to Schoolroom	Mellis Parochial School Managers	R. Stammers, White Lion Hotel, Mellis, Suffolk	" 16
Kingswood Hill—Engine-House at Pumping Station	West Gloucestershire Water Co.	E. D. Marten, M.I.C.E., The Birches, Codsall, Wolverhampton	" 16
Newry—Twenty-One Artisans' Dwelling-Houses	Urban District Council	Robert H. Doherty, Clerk, Town Hall, Newry, Ireland	" 16
Barking—Six Classrooms to Gascoigne-road School	School Board	C. J. Dawson, F.R.I.B.A., Architect, East-street, Barking	" 16
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	" 16
Kingsteignton—Dwelling-House at Sandy's Gate	William Raymont	Samuel Segar, Architect, Union-street, Newton Abbot	" 16
Morecambe—Excavating, Bricklaying, and Concreting Works	Morecambe Tower Co.	W. H. and A. Sugden, Architects, Keighley	" 16
Southwark, S.E.—Additions to Workhouse, Parish-street	St. Olaves Union Guardians	Newman and Newman, Architects, Tooley-street, S.E.	" 17
Isleworth—New Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 18
Burnley—Manufacturing Premises	Gas Committee	J. P. Leather, Gasworks, Burnley	" 18
King's Lynn—Hospital & Administration Block, Horsley's Chase	Sanitary Committee	H. J. Weaver, C.E., Town Hall, King's Lynn	" 18
Brentford—Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	" 18
Sheffield—Showrooms, Offices, &c., Savile-street	T. W. Ward	Edmund Winder, Jun., Architect, Wharf-street, Sheffield	" 19
Farnborough—Police Cottages		W. J. Taylor, County Surveyor, The Castle, Winchester	" 21
Romford—Isolation Wards, Administration Block, &c.	Joint Hospital Board	W. Whitmore, Architect, 17, Duke-street, Chelmsford	" 24
Whitehall, S.W.—Foundations, &c., for New War Office	H.M. Commissioners of Works	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.	" 27
Myton-on-Swale—School		W. Ward, Myton Hall, Helperby	Nov. 1
Banff, N.B.—Coastguard Buildings	Admiralty	The Coastguard Station, Banff, N.B.	" 3
Padstow—Coastguard Buildings	Admiralty	The Coastguard Station, Padstow	" 3
Enfield—Alterations and Additions to Alma-road School	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	" 7
West Brompton—Additions to Infirmary, Fulham-road	St. George's Union Guardians	E. T. Hall, F.R.I.B.A., Architect, 57, Moorgate-street, E.C.	" 7
Morecambe—Bank Premises	Bank of Liverpool, Ltd.	Cressey & Keighley, Archts., Bank Chmbrs, Euston-rd., Morecambe	—
Pontypool—Shop, George-street		Bevan and Co., Ltd., Furnishers, Pontypool	—
Bradford—House in Nab Wood		H. and E. Marten, Architects, 5 and 7, Charles-street, Bradford	—
Long Eaton—Laundry Buildings	Long Eaton & Dist. Steam Laundry	Frederick Ball, Architect, 23, King-street, Nottingham	—
Clacton-on-Sea—Additions to Royal Hotel		A. Sykes, 45, Finsbury-pavement, London, E.C.	—
Kirk Michael—Restoration of Parish Church Organ		The Secretary of Committee, Kirk Michael, Isle of Man	—
Doncaster—House and Buildings at Grammar School	Trustees	R. and W. Dixon, Architects, Barnsley	—
Barnet, Herts—Houses on Willenhall Park Estate		G. D. Martin, Architect, 3, Pall Mall East, S.W.	—
Girlington—Two Houses, Kensington-street		G. C. Gymble, Architect, Parkinson's Chambers, Bradford	—
Newport, Mon.—Mineral Water Factory & Stores, Mountjoy-rd.	William Hancock and Co., Ltd.	Watkins and Brown, Architects, 156, Dock-street, Newport, Mon.	—
Banavie—Additions to Hotel		Cameron and Burnett, Architects, Academy Buildings, Inverness	—
Keighley—House and Shop, North-street		John Judson and Moore, Architects, York Chambers, Keighley	—
Southwold—Cottage		J. Doddington, New Inn, Yoxford, Suffolk	—
Northampton—Factory, St. James's-end	A. E. Marlow	Mosley and Anderson, Twentieth Century Chambers, Northampton	—
Cartmel—Alterations to Grammar School		Settle and Farmer, Architects, Ulverston	—
Burgate—Residence		Fred Bath, F.R.I.B.A., F.S.I., Architect, Salisbury	—
Menston—Additions to Residences		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—
Coxlodge—One Hundred Cottages	Burradon and Coxlodge Coal Co.	The Coxlodge Colliery Offices, Gosforth	—

BUILDINGS—*continued.*

Kendal—Nine Houses, Burnside-road		John Hutton, M.S.I., Architect, Kendal	—
Benton—Villa Residence		John W. Dyson, Architect, 67, Grey-street, Newcastle	—
Chell, Staffs—Workhouse Laundry & Lavatory Accommodation	Wolstanton & Burslem U. Guardians	W. H. Walley, Architect, Queen-street, Burslem	—
Hunslet—Alteration of Maltkiln into Warehouse		John B. Leak, Architect, Waterloo-road, Hunslet	—
Featherstone—Two Houses, Featherstone-lane	Arthur Day	W. Hamilton, Fearnley, Architect, Featherstone	—
London, E.C.—Plastering Work		"Builder," c/o R. A. Knight and Co., 12, Abchurch-lane, E.C.	—
Clay Cross—Twelve Cottages	Clay Cross Co.	W. M. Ashmore, Architect, New Queen-street, Chesterfield	—
Hornsea, East Yorks—Additions to Rolston Hall		Brodrick, Lowther, and Walker, Architects, 77, Lowgate, Hull	—
Abergavenny—Rebuilding 9, Cross-street	G. W. Shackleton	B. J. Francis, Architect, Abergavenny	—
Graffham—Additions to Foresters' Arms		Alfred Pursley, Graffham, Suffolk	—
Hereford—Alterations to Property, Commercial-street	Thos. Corner	W. W. Robinson, Architect, Hereford	—
Billesley—Farmhouse		G. H. Hinton, Architect, 11, Church-street, Stratford-on-Avon	—
Little Lever—New Nob Inn	Chadwick's Walmersley Brewery Co.	D. Hardman, Architect, Silver-street, Bury	—
Brighouse—Rebuilding the Grove Inn, Elland-road		J. Lane Fox, Bond-street, Dewsbury	—
Stone—One Hundred Cottages	Co-operative Land Society, Ltd.	The Society's Offices, 14 and 15, Coleman-street, E.C.	—
Wyke—Stabling for the Red Lion Inn		J. Lane Fox, Architect, Bond-street, Dewsbury	—
North Shields—Rising Sun Inn	Tyne Improvement Commission	W. H. Knowles, F.S.A., 37, Grainger-street, Newcastle	—
Loughborough—Converting Dormitory into Ward		W. T. Hampton, F.S.I., Architect, Swan-street, Loughborough	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Isle of Walney—Two Hundred Workmen's Dwellings	Vicars, Sons, and Martin	The Isle of Walney Estates Co., Ltd., Walney	—
Poole—Two Cottages, Stable, Coach-House, &c.		F. Butler, Carriage Works, Poole	—
Northbourne—Repairs to Church		The Rector or Churchwardens, Northbourne, Deal	—
Stockton—Rebuilding 71, High-street	S. S. Eades	T. W. T. Richardson, Architect, 57, High-street, Stockton	—
Ashton-under-Lyne—Houses (17 to 40)		Samuel Lomas, 5, Stockport-road, Ashton-under-Lyne	—
Prestatyn—Villa		Burton & Percival, Archts., 150A, Stamford-st., Ashton-u-Lyne	—
Barry—New Buildings off Park-crescent	W. J. Rogers, Ltd.	J. P. Jones, Richards and Budgen, Archts, 18, St. Mary-st., Cardiff	—
Rawtenstall—House, Warehouse, and Stable at Holme Bank		John Taylor, 6, Ormerod-street, Rawtenstall, Lancs	—
Bexley Heath—Six Tenement Houses		Hawkins & Edgecombe, Architects, 22, Henrietta-st., Covent Garden	—
Lochmaddy—School and Teachers' House at Kylis Flodda	South Uist School Board	A. MacElfrish, Clerk, Lochmaddy	—
East Ham—Congregational Church		J. D. and S. J. Mould, Architects, 53, Queen Victoria-street, E.C.	—
Utley—Additions to the Roebuck Inn		John Judson and Moore, Architects, York Chambers, Keighley	—
Consett—Two Engine Houses	Iron Company, Ltd.	The Engineer's Office, Consett, Durham	—
Lulworth—Restoring Buttresses of East Lulworth Tower		The Rev. R. Usher, East Lulworth Vicarage, Wareham	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Leigh—Warehouse at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Wombwell—Chimney (40 yards) at Main Colliery		The Colliery Offices, Wombwell, Yorks	—
Leeds—Warehouse		W. Rusby, 25-27, Meadow-lane, Leeds	—
Buxton—Two Detached Villas	B. Wardle	Garlick and Flint, Architects, Terrace-road, Buxton	—
Ulverston—Bank, County-square		Settle and Farmer, Architects, Ulverston	—
Warsaw—Freezing-Chambers, &c., in Market Halls	Municipality	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	—
Great Yarmouth—Engineer's Shops, Foundry, and Stores		Crabtree and Co., Engineers, Great Yarmouth	—
Leeds—Frame Schoolhouse, Cardigan-road	St. Margaret's Church Trustees	Corson and Jones, Architects, 25, Cook-street, Leeds	—
Rothbury—Houses		Thomas Muckle, Rothbury	—
Carlisle—Converting 30, Lowther-street, into Business Premises	Clark Bros. and Co.	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	—
Ilford—Congregational Church		J. D. and S. J. Mould, Architects, 52, Queen Victoria-street, E.C.	—
Leeds—Business Premises and Manager's House, Claypit-lane	Henry Clarkson	Butler, Wilson, and Oglesby, Architects, 12, East Parade, Leeds	—

ENGINEERING.

Whitehaven—Dredging Works (30,000 tons)	Harbour Commissioners	Ernest E. Stiven, Harbour Engineer, Harbour Office, Whitehaven	Oct.	7
Cloghroe, Knockraha, Coolymurraghue, and Kerry Pike—Sinking Wells and Erecting Pumps	Cork District Council	John Cotter, Clerk, Board Room, Workhouse, Cork	,,	7
Hatfield—Widening Two Bridges at Mill Green	Hertfordshire County Council	The County Surveyor's Office, 41, Parliament-st., Westminster, S.W.	,,	7
Bridgwater—Laying Water-Mains (3,125 yards), Stoneware Pipes (170 yards), &c.	Rural District Council	W. J. Press, C.E., Town Hall, Burnham, Somerset	,,	7
Swansea—Engines, Generators, &c.	Corporation	Kincaid, Waller, and Manville, Engs., 29, Great George-st., S.W.	,,	9
Rotherham—Lancashire Boilers, Engines, Dynamos, Pumps, &c.	Corporation	H. H. Hickmott, Town Clerk, Rotherham	,,	9
Hendon, N.W.—Bacteria Bed (800 yds.), Sewage Outfall Works	Urban District Council	S. Slater Grimley, Engineer, Public Offices, Hendon	,,	9
Birkenhead—Salt-Water Storage Tanks and Filter	Corporation	Chas. Brownridge, A.M.I.C.E., Town Hall, Birkenhead	,,	9
Aberavon—Esplanade, &c.	Earl of Jersey	T. Williams, Estate Office, Briton Ferry	,,	9
Tynemouth—Reservoir (3,000,000 gallons) at Moorhouses	Corporation	The Borough Surveyor, Howard-street, North Shields	,,	9
Rotherham—Storage Battery, Switchboards, &c.	Corporation	H. H. Hickmott, Town Clerk, Rotherham	,,	9
Glasgow—Three Electric Travelling Cranes, Constructional Steelwork for Power Station, and Laying Cables	Corporation	John Young, General Manager, 88, Renfield-street, Glasgow	,,	10
Wapping, E.—Alteration of Swinging Gear	London County Council	The Engineer's Department, County Hall, Spring-gardens, S.W.	,,	10
Gravelly Hill—Steam-Boiler for Cottage Homes	Aston Union Guardians	John North, Clerk, Union Offices, Vauxhall-road, Birmingham	,,	10
Londonderry—Killea Waterworks Extension	Council	J. J. S. Barnhill, C.E., 1A, Strand, Londonderry	,,	10
Glasgow—Reconstructing Tramways	Corporation	John Young, Gen. Manager, 83, Renfield-street, Glasgow	,,	10
Hamilton—Pipelaying, &c. (12 miles)	Lanark District Committee	J. and A. Leslie and Reid, C.E., 72A, George-street, Edinburgh	,,	11
Lydford—Waterworks	Tavistock Rural District Council	G. D. Ballamy, Engineer, 6A, Courtenay-street, Plymouth	,,	11
Manchester—Passenger Elevator for Victoria Buildings	Improvements Committee	The City Surveyor, Town Hall, Manchester	,,	11
Warminster—Laying Cast-Iron Pipes (1,200 yards of 8in.)	Urban District Council	A. F. Long, Town Engineer, Warminster	,,	11
Loughlinstown—Copper Steam-Jacket Boiler (50 gallons), &c.	Rathdown Union Guardians	The Master of the Workhouse, Loughlinstown	,,	11
Hamilton—Pipelaying (12,500 yards), Logan to Brown's Bridge	Lanark District Committee	J. and A. Leslie and Reid, C.E., 72A, George-street, Edinburgh	,,	11
Kennington-road, S.E.—Alterations to Machinery at Baths	Lambeth Vestry	John Buley, Consulting Engineer, 5, Laurence Pountney-lane, E.C.	,,	12
Hurstbourne Tarrant—Steel Girder & Concrete Bridge at Ibthorp	Andover Rural District Council	J. Warmald, District Surveyor, South Cottage, Andover	,,	12
Loch Pooltiel—Pier	Inverness County Council	G. Woulfe Brenan, M.I.C.E., Oban, N.B.	,,	12
Milford—Sinking Well and Erecting Pump at Carrowkeel	Rural District Council	S. Watters, Clerk, The Workhouse, Milford, Ireland	,,	14
Tiflis—Tramways	Town Council	The Managing Dept., Town Council, Tiflis, Transcaucasus	,,	14
Chard—New C.I. Tanks, and Water Arrangements at Brewery	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	,,	14
Warrington—Two Sets of Steam-Engines	Corporation	James Deas, C.E., M.I.M.E., Bank House, Warrington	,,	14
Farnham—Additions to Tank, &c., at the Gasworks	Gas Co.	G. McDonald, 104, West-street, Farnham	,,	14
Great Torrington—Waterworks	Corporation	Baldwin Latham, M.I.C.E., 13, Victoria-street, S.W.	,,	16
Kirby Misperton—Widening Stone Bridge		Walker Stead, M.I.C.E., County Surveyor, Northallerton	,,	17
Poplar, E.—Lancashire Boilers, Water-Pressure Drums & Tanks	Guardians	F. J. Warden Stevens, Connaught Mansions, 34, Victoria-st., S.W.	,,	18
Purton—Waterworks	Cricklade & Wootton Bassett R.D.C.	F. Redman, Engineer, Newport-street, Swindon	,,	18
Leeds—Fifty Electric Tramcars	City Council	Thomas Hewson, M.I.C.E., City Eng., Muncipal Buildings, Leeds	,,	18
Poplar, E.—Steam-Jet Plant and Auxiliary Pumping Plant	Guardians	F. J. Warden Stevens, Connaught Mansions, 34, Victoria-st., S.W.	,,	18
Innellan—Extension of Pier		D. and C. Stevenson, Civil Engineers, 84, George-street, Edinburgh	,,	19
Luton—Electric Lighting Plant	Town Council	Albion T. Snell, Engineer, Suffolk House, Cannon-street, E.C.	,,	22
Gloucester—Refuse Destructor, &c.	Electricity Supply Committee	Richard Read, A.M.I.C.E., City Surveyor, Gloucester	,,	24
Barking—Light Railway Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen-street-place, London, E.C.	,,	24
Wigan—Electric-Lighting Plant	Corporation	H. Collings Bishop, Borough Electrical Engineer, Wigan	,,	25
Stonehaven—Harbour Extension	Harbour Trustees	Jas. Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen	,,	30
Port Elizabeth to Humansdorp, Capetown—Railway (70 miles)		The General Manager of Railways, Capetown	,,	30
Chipping Campden—Waterworks	Rural District Council	Nicholson Lailey, A.M.I.C.E., 16, George-street, Westminster	,,	31
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	Nov.	3
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Colonial Secretary, Colombo	Jan.	4
Kintbury—Rebuilding Bridge on Newbury-road	Hungerford Rural District Council	Chas. Calvert, Surveyor, Hungerford		—
Tralee—Swing-Bridge over Canal Waterway	Harbour Commissioners	G. A. E. Hickson, C.E., 25, Denny-street, Tralee		—
Driffield—Gas-Scrubber (40ft. by 7ft.)	Urban District Council	Henry Tobey, Malton, Yorks		—
Manchester—Three Boilers for Warming Town-Hall	Town Hall Committee	J. Rison, Town Hall, Manchester		—
Normanby—Laying 4in. Cast-Iron Pipes (1 mile)		The Normanby Brick Company, Ltd., Normanby		—
Driffield—New Gas-Mains (870 yards)	Urban District Council	G. B. Tonge, Clerk, Driffield		—
Ilford—Portable Steel Crane (3-ton)	Gas Co.	The Engineer's Office, Gasworks, Ilford		—
Uddington—Electric Lighting Plant		J. Watson, Builder, Uddinston, Scotland		—

FENCING AND WALLS.

Bournemouth—Unclimbable Wrought-Iron Hurdles (50)	Town Council	F. W. Lacey, M.I.C.E., Borough Engineer, Bournemouth	Oct.	7
Blackwall, E.—Renewing and Repairing Boundary Fence	Metropolitan Asylums Board	C. Thomson, Supt., South Wharf, Rotherhithe-street, S.E.	,,	9
Warminster—Wire Fencing (1,100 yards) at Butler's Coombe	Urban District Council	A. F. Long, Town Engineer, Council Offices, Warminster	,,	11
Great Harwood—Boundary Walls for Recreation Ground	District Council	R. Chippendale, Clerk, Great Harwood, Lincs	,,	13
Morthoe—Fencing and Laying-out Burial Ground	Parish Council	E. Henshall, A.M.I.C.E., Woolacombe, North Devon	,,	16
Stafford—Pine Wood Fencing (1,100 yards) and Gates	Committee of Management	G. H. Smallman, Treasurer, 29, Gaolgate-street, Stafford	,,	17
London, W.—Fencing Materials	Great Western Railway Co.	The Stores Superintendent's Office, Swindon	,,	23
Leeds—Boundary Walls Round Harehills House		J. W. Thackeray, A.S.I., Architect, 14, Infirmary-street, Leeds		—

FURNITURE AND FITTINGS.

Ballinasloe—Bedsteads and Bedding to District Asylum		J. Young, Clerk of Asylum, Ballinasloe, Ireland	Oct.	7
Hendon—Bedsteads for New Asylum	London Sick Asylum Dist. Managers	F. W. Bailey, Clerk, Cleveland-street Asylum, London, W.	,,	9
Maryborough—Iron Bedsteads (20) and Wire Mattresses	Committee of Management	J. V. Corcoran, Clerk, District Asylum, Maryborough, Ireland	,,	11
Winlaton—Glazed Movable Partitions in Schools	School Board	Henry Dalton, Clerk, Winlaton School Board, Blaydon-on-Tyne	,,	12
London, E.—Renovating Furniture in Vestry Hall	St. George-in-the-East Vestry	The Surveyor, Vestry Hall, Cable-street, London, E.	,,	19
Leeds—Forty Four-Square Window-Frames, &c.		S. Smith, 133, Kirkstall-road, Leeds		—

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WHAT DOES SUPERVISION IMPLY?

THE question has been raised of late by one or two decisions whether, if the architect certifies a work is completed to his satisfaction, he thereby guarantees every detail of the work, such as the proper making of the joints of a drain or the due composition of concrete or plaster. No one doubts that the architect is called upon to exercise a reasonable degree of care and skill in his professional duty and in the granting of certificates; but what is a "reasonable" care? Does his certificate hold him responsible to the letter of the specification, and to that degree of personal supervision that would be necessary to examine every detail and see that it is carried out perfectly? We can hardly think such a view an equitable one, for, if it was, no professional man would come out scathless. He would have to be daily on the work, seeing to everything being done exactly as the drawings and specification required. Again, what are drawings and specifications supplied for, if he requires to be personally present every hour of the day? They imply a certain amount of trust in those who carry out the work.

A final certificate binds both owner and contractor, and in one important case, to which it is needless to refer here, the judgment was that the owner is bound to pay the amount certified for, even though the work was not ordered in the manner required by the contract, or was not executed in a proper manner. Lord Coleridge said in this case that when once the architect has given his decision it does not lie in the mouth of the owner to say, "You have neglected your duty to us." The architect by a final certificate has to decide all matters of dispute and difference. In another case it was laid down that, though the surveyor might be wrong and fallacious in his judgment, his decision was binding on the plaintiff, unless fraud could be proved. Here the contract provided that all matters in dispute should be left to the surveyor, whose decision was to be binding. Other decisions have confirmed this ruling, that the architect's certificate is final, and neither party can go behind the certificate. According to this view, when the architect certifies that the work is duly executed, the employer, unless he has ample evidence that there has been collusion between the architect and the contractor, has no ground for charging the former with neglect. We do not say that a certificate should exonerate an architect for neglect in discharging the customary duties of his office; but if before he gave a certificate he had to examine such things as the composition of mortar, or the substratum or layer of dry rubbish upon which paving is often laid, and satisfy himself they were sufficient, we hold it would be an unreasonable requirement, and that not one out of a dozen men could accomplish it. The binding nature and finality of a certificate depends, of course, on the terms of the contract, and in each case this consideration has to be taken into account. Yet no responsible architect would certify a state of completion without considering the work that had to be accomplished, and whether it was well worth the amount the certificate represented. The contractor may not have executed this or that detail quite according to the drawings or specifications, or he may have allowed to pass a composition that was not up to the standard; but if the work, as a whole, has been fairly done to the architect's satisfaction, the latter is bound to comply with the contract.

The responsibilility of the architect in supervising buildings has been frequently called into question of late, as our reports in our Legal Intelligence have shown. A few months ago (June 23 last) we commented on a judgment pronounced by Lord Kyllachy in an action in which a lady in a Scotch Court sued an architect of Edinburgh for damages for breach of contract, the result of which was the lady pursuer was awarded £40 damages and expenses. The case was fully reported in the *Scotsman* of the 3rd of June last, the main points of which we briefly referred to. Since our remarks condemning the decision, the defendant (Mr. Frank Worthington Simon) appealed to the Second Division of the Court of Session, as he intimated in a letter to this Journal, and on July 12 the Court of Appeal unanimously confirmed Lord Kyllachy's judgment; all the four judges concurring in the remarks of Lord Young. The main facts may be remembered. The architect undertook to prepare plans and specifications for a villa in the suburbs of Edinburgh, and it was alleged by the pursuer that through want of proper supervision on his part dry-rot was introduced into the building, which had caused much trouble and had cost £30 to eradicate. Instead of proceeding against the tradesmen responsible for the mischief—a mason and a carpenter, each of whom threw blame on the other—the pursuer sought redress against the architect. The remarks of the judge are worth quoting on this point. He admitted that the pursuer was reluctant to take this course "because the defender, apart from his supervision of the contractors, seemed to take a good deal of trouble on the pursuer's behalf, and to have had a good deal of correspondence and many meetings with her on minor matters." Referring to the dry-rot, he said it was generated in the "bottoming" which underlaid the cement floors of the scullery, coal-cellar, and w.c., which were on the ground floor. This bottoming ought, as specified, to have consisted of about 2½ft. of broken stone, the uppermost three inches having to be of small stones and to be supplied by the plasterer; and the rest described as "dry stone filling" to be supplied by the mason. But the material used in the uppermost three inches was alleged to be miscellaneous rubbish, partly of chips of stone with a large proportion (25 per cent.) of "shavings, pieces of wood, plaster, sacking, and general sweepings." Being covered with cement, and the air excluded, the fungus dry-rot appeared on the pieces of rotten wood, and thence spread to the door-posts of the kitchen and scullery, which were imbedded in the bottoming, and soon passed into the woodwork of the house. It was contended, "the supervision of the contractors was part of the defender's duty, but as regards this part of the work he gave no supervision at all, certifying the work as duly executed, in reliance on the contractor's faithful observance of the specification, and this the pursuer said constituted a breach of the contract on the defender's part." His Lordship admitted there was not any special contract as "to the kind or degree of supervision." The question, he said, was "What kind of supervision was implied in the defender's employment as architect? It was certain that he undertook some supervision, and he undertook, like other architects, to grant certificates to the contractors upon which they should be paid, and by those certificates he certified, if not expressly by the plainest implication, that the work done had been done according to contract. *Primâ facie*, therefore, he must at least be held to warrant that, in so far as he could ascertain by reasonable care and skill, there had been no scamping of the work. Upon this ground his Lordship was not prepared to put the defender's responsibility lower; he was therefore of opinion that the defender had failed to show that as to this part of the work he gave due and reasonable supervision. The Division adhered to the judgment, holding that under his employment the defender was bound to see that the work was properly done before certifying it to have been well done; though in the contract with the tradesmen there was a clause that they should uphold their work for two years. The defect showed itself within twelve months.

Lord Young's confirmatory remarks on his decision add nothing to the argument. He thought the interests of the employer required a great deal more attention than some of the professional witnesses thought sufficient—a view that would completely ignore professional evidence whenever given. The architect was not expected to personally supervise, but it was work his servants could do. May we not ask whether this is feasible or possible in small undertakings? It would mean the engagement of a clerk of works on every small building—an expense which few employers would consent to. There must be a reasonable construction placed on the duties of the architect, and on no other basis can any permanent satisfaction be given. The decision given in this case is unfortunate for the profession on both sides of the Tweed, and it will tend to keep open the feud between architects and their employers. We have given the result of the appeal because it relates to the two far-reaching questions and their bearing on one another—supervision and the granting of certificates. The profession will only be satisfied with a ruling which places on a reasonable basis the requirements of supervision, and puts a check to the troublesome demands of people who think an architect should be held accountable for such a defect as here described, and for every pound they expend beyond the terms of the contract.

ESTIMATES.—XXV.

IRONMONGERY—CASEMENT FITTINGS—FURNITURE.

SASH and casement fittings is an important class of goods, and the prices to be affixed to articles of this kind can only be correctly obtained from trade-lists or quotations. As with other kinds of special ironmongery, the best plan for the builder is to obtain specific terms from some large firm of ironmongers. In buying large quantities, a considerable reduction can be made by the wholesale manufacturer. The prices we have given do not take these allowances into consideration nor the trade discounts on the various articles. Several useful improvements have been made in these fittings. To take axle pulleys. We have not only those bushed with brass and gunmetal, but those in which the grooved wheel is made in one piece, axle and all; others have, as in Hill and Co.'s roller-bearing axle pulley, reduced friction, and strengthened the iron frame. In this case the axle is fixed, and the periphery of the wheel revolves on rollers which turn on the axle. The "grip" patent pulley is fixed without screws. It is fixed by boring three holes in the pulley-stiles and driving it in.

Much ingenuity has been expended on sash-fastenings, by various makers. Some have an automatic-locking arrangement when the lever is turned, and is without springs, as the "Guardian" sash-fastener; some bind the sashes together, as the "Binder," others have a cog action or consist of screws, which clasp the sashes, and these vary in price, the simplest costing about 6d. or 7d. each, and the most expensive 2s. 6d. to 3s. each. Those with angle-plates offer security. Casement-fasteners are made in several qualities; there are malleable iron fasteners with lever handle from 6d. each, cranked cockspur fasteners from 8d. to 1s. 6d. each, and several kinds with turned, fluted, and twisted handles, from 10d. to 2s. each, sold by the dozen. The brass fasteners range from 8d. to 6s. each; these should be strong, and the handle should draw the casements together. A strong fastener may be had for about 2s. 6d. to 4s. each. Casement-stays are made in various qualities in iron, brass, or gun-metal. The plainest kind of wrought-iron, 10in. long, Berlin-blacked, costs about 5s. to 12s. per dozen. Those with wrought-iron bar and brass boxes. 12in. by ½in., are quoted at 18s. per dozen, and plain solid brass, strong, 3s. 6d. to 6s. each. Hill's fluted bar, single-jointed brass casement stays range from 3s. to 7s. each, and are made in lengths from 8in. to 15in.

Spring-door hinges, floor door-springs or centres comprise numerous patents and improvements, and the prices of these articles must be obtained from trade lists of manufacturers. Smith's double-action door springs, with bushed brass shoes, for medium doors, 1¾in. thick, costs about 15s. each for light doors, and for heavy 2in. doors 22s. Other kinds—as the "Climax," the "Invincible"—range from about 20s. to 28s. 6d. each for heavy 2in. doors. These are actuated by springs and screws for adjusting the door. The Ben Turner patent adjustable regulating door springs vary from £3 to £4 16s. for heavy doors. In some a pneumatic check is used to prevent any slamming. With these floor springs an adjustable top centre is used. Other forms of springs are fixed on the door or frame. Mortise and rim lock furniture must be priced by reference to the catalogues of manufacturers, as they vary much in quality and design. For improved sets consult the catalogue of R. Melhuish, Sons, and Co., Fetter-lane. The prices per dozen sets are from 7s. 6d. for rim, and 11s. 9d. for 6in. mortise locks. Mace's cast rose sets are 15s. to 24s. 6d. Tonks' patent keyed mortise and rim furniture is made in various qualities and materials, and costs about 2s. extra on the set. Lock plates, with suites of furniture to match in every style, are sold. (See catalogues.)

PATENT FLOOR-SPRINGS.

No. 2. Sets of Archibald Smith's double-action swing centres for 2in. doors, including letting into oak, filling the boxes with glycerine, and adjusting.

The "Janus" double-action door-spring, for doors of ordinary size, is priced in Laxton's at 35s. per set. For extra large doors 60s. per set may be put down. Several kinds of spring hinges are on the market ranging from 30s. to 62s.

	£	s.	d.
Say, cost of door spring	2	0	0
Fitting into oak, &c.	0	2	6
Fitting and adjusting	0	0	6
Per set	2	3	0

Smith's patent spring for light doors, 2in. thick, is priced in one catalogue 21s. each; for medium doors to 2in. thick, 24s. each, and for heavy doors 48s. each.

No. 2. Patent double-action centres for heavy doors; self-lubricating, including letting boxes into oak and oiling.

These are special floor door-springs, and are worth more. In Young and Marten's list Ben Turner's patent adjustable regulating door-spring and top centre for 2½in. doors is priced at £3 3s., extra strong; for double strong the price quoted is £4 16s. Add to these prices letting box into oak, and oiling and adjusting, say 3s. 6d.

DOOR LOCKS AND FURNITURE.

No. 6. Six-inch mortise locks and keys, supplied by R. Melhuish, Sons, and Co., Fetter-lane, with corresponding brass bolts, furniture, &c., complete.

These may be priced at from 3s. 6d. to 5s. 6d. each for ordinary doors. The corresponding furniture may be priced as follows:

	£	s.	d.
Cost of lock, say	0	3	6
Knobs and roses, per set	0	1	8
Escutcheons	0	0	3
Finger plates, long and short, say	0	2	6
Screws and fixing, say	0	2	3
	0	10	2

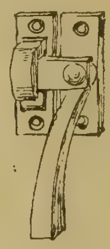
(See R. Melhuish, Sons, and Co.'s catalogue of brassfoundry.)

No. 6. Sets of Wilkes's mortise furniture, knobs 2½in.

These cost 6s. 2d. per set.

Ditto highly finished cast brass, with Pitt's roses.

Put these down at 4s. 6d. to 5s. per set.



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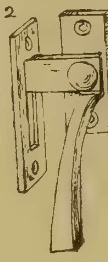

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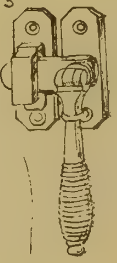

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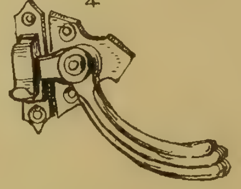


No. 12. Sets of polished brass finger-plates.

In Melhuish and Sons' list plain, long plates are 1s. 5d. each, and the short 1s. 2d.; ribbed pattern machine made is priced 10s. 3d. for long per dozen, and 9s. for short.

No. 3. Brass rolled metal lock-plates, and fixing.

These combine finger-plates with a lock-plate. The plain kinds are about 10s. 6d. each. A very elegant design (see Melhuish's catalogue) is 13s. 6d. without furniture; the finger-plates are 3s. 6d., long and short. Very handsome lock-plates without furniture, in several styles suitable for Renaissance work, are priced from 16s. to 53s. each. Suites of finger-plates and mortise furniture may be had to correspond. Fixing may be put down at 9d.

No. 2. Hobbs, Hart, and Co., 7in. Patent "Protector" locks, two locking latches.

These are priced at 45s. each; add for fixing 2s.

No. 2. Hobbs, Hart, and Co.'s 6in. Patent Protector, two-bolt mortise locks and fixing.

Laxton puts these at from 7s. 6d. Say, with labour, 9s.

No. 1. 10in. drawback lock, brass furniture, value 16s. p.c.

	£	s.	d.
Cost of lock	0	16	0
Labour fixing	0	2	0
	0	18	0
10 per cent.	0	1	9
	0	19	9

Screws are usually supplied with the locks.

No. 8½. Sets of Hobbs, Hart, and Co.'s solid steel slotted spindle furniture for mortise locks, with 2½in. brass knobs.

Consult list of makers for their special fittings.

No. 4½. Sets brass furniture for mortise locks, escutcheon, and screws complete.

These may be had at various prices. Fluted brass furniture, with patent spindles of superior make (Hill's), costs about 6s. 9d. the set complete.

No. 1. Pair 24in. strap hinges and bolts 2in. by ¼in.

If made, these hinges will cost about 6d. per lb. If we say the weight is 10lb. the pair—

	£	s.	d.
Cost of hinges, 10lb., at 6d.	0	5	0
Eight bolts and screws	0	1	3
Fixing to gates, say	0	2	0
	0	8	3

SASH FITTINGS.

No. 12. Sets sash centres of japanned iron.

These may be priced at 4d. per set; add for screws 1d., and fixing 9d.—1s. 2d. per set. Best malleable iron sash pivots are priced about 4s. 6d. per dozen for 3in.; 2in. pivots cost 3s. a dozen.

No. 6. Sets brass ditto, 2½in.

About 8s. per dozen, and, with screws and fixing, say 10d. each.

No. 6. Strong polished brass sash-lifts, 2in. wide.

These cost from 2s. to 3s. 6d. per dozen, with two brass screws—

	£	s.	d.
Say each pair	0	0	8
Screws and fixing	0	0	4
	0	1	0

No. 6. Brass lifts and pulls.

Put these at 6d. each, and fixing 3d.

AXLE PULLEYS, ETC.

No. 32. Iron axles pulleys, 2in.

These cost about 18s. to 30s. per gross. If with brass face and wheel, 60s. per gross. Cheaper ones, painted face, may be got at 11s. to 16s. per gross.

A good axle pulley of this size costs about 2s. 6d. per dozen.

No. 16. Best 2in. brass face and wheel pulleys, bushed.

These are priced from 60s. to 80s. per gross in one list, or, say, 5s. to 7s. per dozen. Best, extra strong, gunmetal bushes would cost about 30s. per dozen.

12. Extra strong 2in. brass pulleys, with brass face and wheel for metal lines.

These may be put down at from 15s. to 16s. 6d. per dozen.

No. 8. Kenrick's patent "secret" axle pulleys.

With brass face and iron wheel, the prices given are from 42s. to 51s. per gross; all brass, 58s. to 72s. per gross for a 1¾in. pulley. In this pulley the wheel and axle form one piece, and have chilled bearings; the frame is also in one piece.

No. 8. Brass face and brass wheel gun-metal bushed ditto, extra strong, 2¼in.

One list gives 21s. per dozen.

Hill's No. 271B patent roller-bearing axle pulley, 2¼in., 25s. per dozen. In this pulley the axle is fixed, and the grooved part of wheel revolves on rollers.

CASEMENT FITTINGS.

No. 4. Strong single-jointed brass casement stays for casements opening outwards, 12in. long. (See sketch No. 5.)

Price these at 3s. or 3s. 6d. each. There are some made with a screw-down wedge action. These cost about 5s. each; screws and fixing to add.

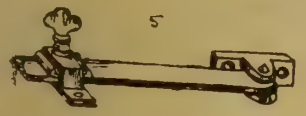
	£	s.	d.
Cost of fastener, say	0	3	6
Screws	0	0	1
Fixing at ·033	0	0	3½
	0	3	10½
10 per cent. profit	0	0	5
	0	4	3½

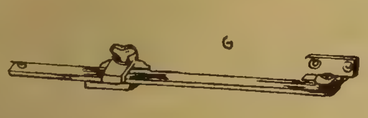
No. 4. Ditto ditto for casement opening inwards, screw-down, 12in. long.

A very strong polished brass single-jointed stay, with screw-down wedge action, is made by Hill and Co., and is priced 6s. 3d. each (No. 2711).

No. 10. Ditto brass screw-down fluted bar, 12in. long.

Price at 4s. each, and add for screws and fixing, say 4d. each. Ordinary stays, with drilled bar and pin, may be had for 2s. 6d. or less each. (See sketch No. 6.)





No. 5. Bronze iron casement bolts.

These are of various prices, and range from 1s. to about 2s. 6d. per foot, with brass fittings.

The minimum charge is 5ft.

If the bolt is ¾in. the cost will be about 2s. 6d. to 2s. 10 per foot.

	£	s.	d.
Cost of bolt, 6ft. long	0	15	0
Fixing, say, 3d. per foot	0	1	6
	0	16	6

No. 4. Brass espagnolette bolts ⅞in. diameter, and fixing.

These are priced in Laxton at 4s. 9d. per foot run.

	£	s.	d.
Cost of bolt, 6ft.	1	8	6
Fixing	0	4	0
	1	12	6

No. 2. Brass ditto ¾in. diameter, best finish, 6ft. 6in. long, and fixing.

The price of Hill's brass espagnolette bolts of the best finish is 6s. per foot.

	£	s.	d.
Cost of bolt, 6ft. 6in. long	1	19	0
Fixing	0	5	0
	2	4	0

French casement bolts, triple action, would cost a trifle more. The extra cost depends not only on the diameter of bolt, but the action, the width of mount, the kind of shoot and knob or handle. The prices in one list range from 4s. to 5s. 9d. per foot.

No. 5. Brass water-bars, 4ft. long, each screwed to rail of casements and sill, to open outwards.

These vary in price; a very good one costs about 2s. 6d. per foot run; but the price is sometimes 7s. to 10s. for casements opening outwards.

	£	s.	d.
Price of water-bar, 4ft., say	0	10	0
Fixing	0	2	0
Screws	0	0	2
Per casement	0	12	2

No. 5. Archibald Smith and Stevens' patent "Janus" sill-bars for casements opening inwards.

These are priced at 5s. per foot run.

No. 4. "Janus" brass sill-bars for casements opening outwards.

These are 3s. per foot run.

Hill's brass water-bars are priced at 2s. 6d. per foot, and for casements opening inwards 3s. 6d.

No. 5. Archibald Smith and Stevens' patent weather-tight "Janus" fastening for folding casements opening inwards, with metal groove, and tongue shooting up and down, 6ft. long.

This is quoted at 6s. 3d. per foot; if with double levers, 5s. extra; but it is best to obtain price from makers.

ARTS AND CRAFTS EXHIBITION.

THE exhibition now open in the New Gallery carries on the aims and traditions of the advanced art cult partly initiated and supported by that able designer and craftsman William Morris. In a note prefixed to the catalogue, we see it is three years since that great poet, artist, and Socialist passed away, at the very eve of the opening of the fifth exhibition. The appreciative notice written of him by Mr. Walter Crane will be read with interest. In the South Gallery an instructive exhibition of works by William Morris is opened. We see many beautiful conceptions for hangings, Arras tapestry, and silk and wool hangings taken from birds, trees, and flowers. The series of printed cotton chintzes (Nos. 300 to 324) and the wall-paper designs (Nos. 325 to 349) illustrate the wealth of this master's invention in taking natural objects, flowers, and fruit as motives for design. In this gallery one oil-painting by Morris, "La Belle Iseult," will be seen—a picture remarkable as the only one he painted; it has a pre-Raphaelesque treatment. Then there is the fine tapestry of "The Four Seasons," lent by the Department of Science and Art—a work of much beauty in the figures representing the seasons—and the fine collection of original designs and trial pages for the Kelmscott Press. Some of the borders and initials are full of power and luxuriant fancy, and they show us the motives and modes of execution adopted by Morris.

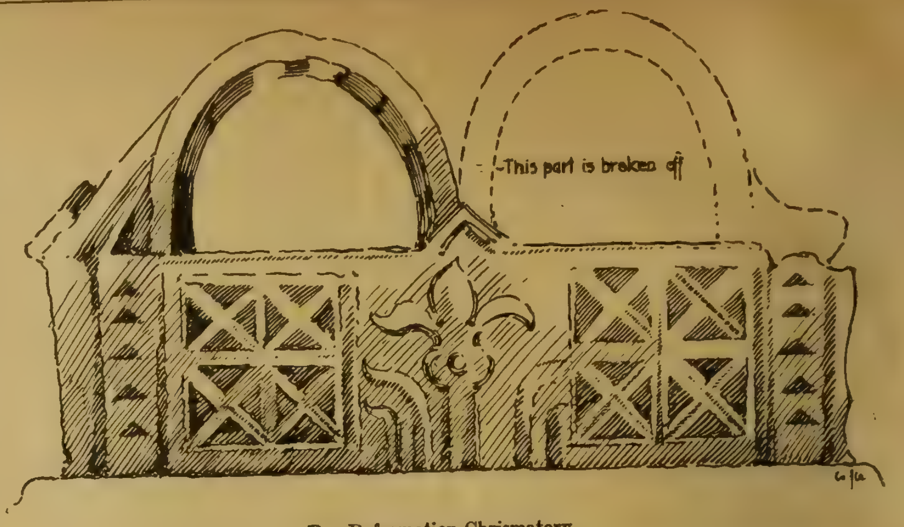
The West Gallery is full of workmanship, displaying the aims and imagination of the new school. Embroidery and needlework are largely in evidence. We see some clever designs by the President, Mr. Walter Crane, as "The Chase," executed by Mrs. C. Morrell; a very rich altar frontal designed by Mr. J. Paul Cooper, executed by Miss Violet and Maud Cooper, and a needlework screen by Ada M. Le Roy (12). The President exhibits a design for frieze panels in coloured plaster—"The Genius of Mechanical Invention inviting Commerce and Agriculture," and "Electricity uniting the Quarters of the Globe," in high relief, designed and modelled by Walter Crane. The designs for Costumes in the Art Workers' Guild Masque are clever, and represent various figures dressed to display the characters depicted. "The Dance of the Five Senses" is picturesque, and the drawing clever. A portière embroidered in cotton by the President, executed by his daughter, and a large portière, designed by H. Dearle and executed by Messrs. Deacon and E. and F. Wright, is a large, bold, and very rich design, in which a scroll of foliage of large leaves is the main feature, and flowers are intertwined. A chalk cartoon of proposed decoration on staircase, Welbeck Abbey (67), by Louis Davis, and for stained glass at Hambledon Church, Hants, by R. Anning Bell (69), in which the Virgin is shown at devotion, and the Angel Gabriel; the painted panels for screen, by Frank Brangwyn (71), a pastoral subject with a foreground of lilies; a cartoon for window in Kelvedon Church, by Louis Davis; and Reginald Hallward's clever design for small window at St. Etheldreda's Church, Fulham (79), are worth notice. Another series of cartoons for a five-light window at Silk-Willoughby, by C. W. Whall, is interesting in the treatment of subjects (85). An embroidered panel, by Mary J. Newill, "The Wandering Wood" (101), and another appliqué panel illustrating the "Faerie Queen" (106), a Triptych by Armory Bell, a Fountain by the Della Robbia Pottery Co. (80), and some clever works by Mrs. Walter Cave, must be mentioned. The cases of printed books, bindings, jewelry, enamels, embroidery and textiles, metal-work, &c., show many specimens of skilful invention and execution that will repay study. There are also a few designs for panels by A. J. Gaskin (122), exhibited by the Birmingham Municipal School of Art; a bronze and stone memorial, by Geo. Frampton (108); works by Ada Clegg (115), and others, which give evidence of improved taste.

The North Gallery is even of greater interest from an architectural point of view. We see the designer and craftsman working hand in hand. One characteristic of this exhibition is that those who show their work are students of structural line and form; every cabinet, chimney-piece, table, and chair is designed as a craftsman alone would design it, by making every practical requirement of the material and the use of the object the ruling motive of the design. We see many instances of this principle, though in some cases it is wilfully exaggerated. The "Cottagers Chest" (153), designed by Ambrose Heal and executed by C. Field, is a simply-treated chest of drawers, the fronts having small, under-cut hollows for the purpose of introducing the fingers. C. R. Ashbee, who is a master of the art craft, shows an oak writing cabinet, stained dark green, without any mouldings; the front and sides are flush, and it is exhibited by the Guild of Handicraft. This plain flush treatment has its hygienic value—there is nothing to catch the dust, it is strong, and can be easily cleaned; but it looks bare. This plainness is relieved greatly by the very effective metal mounts. Another writing cabinet (176), designed by Mr. Ashbee, of oak with white nest of drawers inside, is also relieved with metal handles by W. Thornton, C. Downer, and W. A. White, and is also exhibited by the Guild. The workmanship is excellent. An "Oak Chimney-Piece" (180), designed by G. Ll. Morris and executed by J. P. White, is a departure from the conventional mode. "A Cabinet in Teak" (193), designed by Mervyn Macartney, executed by J. Smith and J. Davis, exhibited by Mardes and Harper, is an elaborate piece of cabinet work; the drawers are in three upright bars, and the fronts are moulded. Still more elaborate is the "Rosewood Cabinet" (200), designed by W. A. S. Benson, executed by Benson and J. S. Henry, is prettily designed, having a polygonal front on plan or semi-nonagon; the sides are filled with "old-silver" mounts, arranged in circular and diamond-shaped panes for the glass. An "Old Bureau" (228), designed by A. Heal, is very simple and self-evident in its design; there is a fold-up flap, the plain woodwork is relieved by metal mounts. A "Mahogany Writing Cabinet" (235), designed by C. R. Ashbee, has some very artistic metal mounts cut into delicate leaf ornament. The lock and handles are very effective. This metal work was executed by W. White and J. Bailey. Plain and sensible also is an "Oak Dresser" (240), by Charles Spooner; it has a square-framed cupboard, the only relief being the bright ornamental locks and straps. The large screen in wrought iron by H. Wilson and W. Dawson (255), in flat metal, relieved by channellings, and a firegrate in forged iron and brass, are noticeable for some effective treatment. In the central hall may be seen a few other specimens of craftsmanship unrestricted by convention. George Jack has a bold fireplace, with voussoir-shaped mantel, wide shelf, and tiled sides, by the Falkirk Iron Co.; another by the same designer, very simple in treatment, is 458, and 471 is a case of very effective door furniture, designed by R. Ll. Rathbone, and executed in his workshop. The beaten-up hinges, latch, and bolts are very pleasing adaptations. A model of a small country house, by Lionel F. Crane (445), is picturesque. Numerous other exhibits in metal-work, some exhibited by the Central School of Arts and Crafts and Guild of Art Craftsmen, are indications of progress in workmanship under the guidance of right principles.

DEMOLITION OF CHIMNEYS.

IN these progressive times of setting back ancient building lines, widening the roads and streets, and generally improving the thoroughfares of nearly all our important cities and towns and local centres of trades and industries, the operations of destruction and demolition must inevitably precede those of reconstruction and rehabilitation. A very recent and excellent example of the first part of our statement, now rapidly approaching completion for the present, was afforded by the clearance upon a large scale of the west side of Parliament-street, King's-street, and a part of the north side of Great George-street, extending as far as the new building of the Institution of Civil Engineers. In effecting the removal of structures of all descriptions, there are three points of primary consideration which must be carefully attended to. The first is to accomplish the work without causing any injury to the safety of the public and the workmen employed; the second is to conduct the taking down of the buildings in such a manner as will do no damage to adjoining property situated beyond the limits of the area of demolition. Again, attention must be given to the cost of the operation, which will mainly depend upon the fact whether the old materials are worth anything or only fit for breaking up and carting away at the minimum of expense. It is but fair to state, that more care is bestowed upon the taking down of old structures, than formerly, which is possibly partly due to the circumstance that the value of the old materials has increased, and also that the safety of the public demands it. Even under the most favourable conditions, a deal of damage is done, some of which is unavoidable, in the removal of houses and buildings, especially to the glass, tiles, slates, or whatever materials the roof may be covered with, which suffer considerably.

It is evident that the cost of the temporary or false work, as the Americans term the scaffolding, ladders, and appliances, for hoisting, lowering, and shifting the material, with other things being equal, be proportional to the height of the structure. It is, therefore, a much simpler and less costly operation to take down a building some 60ft. or 70ft. in height, than to apply the same process to one measuring between 200ft. and 300ft. in altitude, as in the case of a tall chimney. It is true that the demolition of a chimney is not an every-day occurrence; but, nevertheless, it has to be occasionally undertaken. An instance took place a very short time ago, which presents some practical information and details which are deserving of notice. The case in point was the removal of a chimney in the North of England, which had been built just twenty years before. There was no defect or weakness in the chimney which necessitated its demolition; but it no longer served its purpose, and so it had to come down. Its principal dimensions were—height 270ft., external diameter at base 21ft., and at top 14ft. It was built of brick, with a thickness of 3ft. 6in. at the ground level, and of 9in. at the summit. The *modus operandi* was conducted as follows: At a height of 3ft. from the ground-line portions of the wall were cut out on opposite sides of the chimney, and the brickwork replaced by wooden blocks 18in. in height, 14in. in breadth, and 12in. in length, wedged up at the corners by small thin pieces of hard timber. Each of these blocks was composed of several series of planks superimposed upon one another in tiers, and separated by small wooden blocks 3in. in thickness. The hollow spaces in each tier were filled up with sawdust, and the whole of the timber framing well saturated with tar. About 40ft. of the circumference was treated in this manner, which left, as the perimeter of the chimney was 64ft., 24 linear feet of solid walling to support the structure previously to the second phase of the demolition. This comprised the piling up of an inflammable palisade of woodwork around the spaces filled as already described, and setting the whole on fire. In order to permit of the combustion of the timber proceeding as uniformly as possible, which was essential to the success of the method adopted, jets of paraffin were thrown upon any part where the flame showed signs of slackening. In less than ten minutes after firing this destructive *auto da fé*, the chimney quietly collapsed along the lines laid out for it. The cost of the whole operation was less than half of what would have been incurred if the old method of employing scaffolding and its accompanying accessories had been adopted, without taking into account the many thousan of bricks which reached the ground in fairly good condition. These, when scraped and cleaned, could be used in the "backing" of any description of brickwork, and could be readily sold for whatever price they would fetch. T. C.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Pre-Reformation Chrismatory.

THE CHURCH CONGRESS ART EXHIBITION.

THOSE who can recall the earlier exhibitions of ecclesiastical art will appreciate the important progress that has been made and is represented by the present exhibition at the Imperial Institute, which was opened last Saturday. The exhibits rather suffer from the narrowness of the gallery in which they are placed, which gives little room for central trophies or stalls devoted to modern production of metal-work and embroidery. There is one feature of the present exhibition that places it high as compared with its predecessors. We mean the collection of church plate and embroidery; and the student of ecclesiology, especially of that branch devoted to church plate, will be able to compare the ancient and modern work, both in design and workmanship. We have here a most complete collection of chalices, patens, flagons, and other kinds of church plate, but only a few of pre-Reformation times, chiefly since, especially the fine loan collection of plate described by Mr. Edwin Freshfield, M.A., F.S.A., belonging to parish churches in London and Middlesex. These were made from the early part of King Edward VI.'s reign to the present time.

The exhibition of modern work is representative mainly of metal-work, stained glass, and church embroidery. The very beautiful display of the well-known firm of

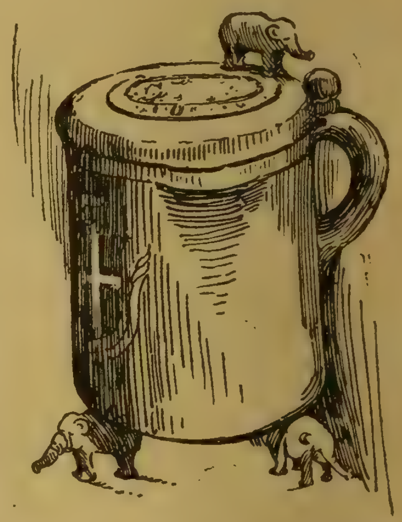
MESSRS. HART, SON, PEARD, AND CO., LTD.,

of Drury-lane, Strand, whose stall is about halfway up the gallery on the right-hand side from entrance, must be inspected by all who are interested in high-class art-metal work. We now particularly mention a silver chalice and paten for St. Mary's Church, Stoke, Ipswich—a very unique design, copied from the Cambridge Camden Society's work, executed with great skill and feeling; and another of somewhat similar design for the C.B.S., of 15th-century character, with plain foot and a rich knob. We see also a very fine chalice for St. George's Church, Cannes, and a silver amalgam gilt chalice for St. Peter's, Parkstone. A very effective memorial tablet executed in bronze, to be put up in a church near Manchester, in which the design is cut in relief, is another exhibit. Several artistically-designed and effective altar-crosses are finished in a dead gold; another, richly jewelled with real crystals, made for the church in Toronto of the Rev. Chas. Darling; these and others must be seen to be appreciated.

In the centre of gallery is a collection of works executed by this firm, including a very beautiful lectern, supported round the base by three richly crocketed buttresses, finished a low polish; altar-cross, and candlesticks, for Malvern College Chapel, being carried out by Sir Arthur Blomfield; the design of screen and pulpit at St. Peter's, Eaton-square, executed by Messrs. Hart, Son, Peard, and Co., and the brass Renaissance Communion railing for Canterbury Cathedral, from a design by the same architect. The adoption of Renaissance is rather remarkable. Some handsome bronze standards for Eaton Hall, designed by Messrs. Waterhouse and Sons, a fine sanctuary candlestick of bronze, and some elegant sanctuary lamps are exhibited. A very handsome alms-dish of brass *repoussé*, with a bold relief border of Italian design, finished with a low polish, is in this varied display of metal-work.

MESSRS. HARDMAN, POWELL, AND CO.,

of Cockspur-street and Birmingham, exhibit several specimens of their art metal-work, altar-crosses, candlesticks, chalices, patens, cruets, flagons, and two handsome eagle lecterns, besides mosaic decorations, &c. Stained glass is well represented by Messrs. J. Hardman and Co.



Hammered Silver Cup from Shrewsbury, 1642.

MESSRS. HEATON, BUTLER, AND BAYNE,

of Garrick-street, whose work in this branch of Church decoration is in high repute, will be noticed for the specimens of stained-glass in four two-light windows and cartoons. These artists in stained glass, mosaics, and decoration have carried out windows all over this and other countries; amongst them we may mention windows in Manchester Cathedral, Stratford-on-Avon, Bolton, English Church, Grasse; New York, &c. One subject they have executed, "The Adoration of the Magi," is admirable in composition and colour.

Mr. T. J. Gawthorpe, 16, Long Acre, shows a collection of wrought-iron and brass work. We refer especially to a fine wrought example of a grille, with foliated and raised ornament; also to a very effective form of revolving lectern made of wrought iron which revolves on a polished brass ball. Instead of wood or brass, it has a thick leather book slope with a cross in red, hand stamped, which makes a capital rest for the books. An alabaster and marble memorial is exhibited, and some excellent engraved memorial tablets.

MESSRS. GEORGE WOOLLISCROFT AND SON, LTD., tile manufacturers, Hanley and Finsbury-pavement, display a choice collection of reredos panels, stained glass, Della Robbia ware, encaustic tiling, glass and marble, mosaic, wrought-iron work, &c. Their speciality, "Vetropake," for reredoses and decorative panels, should be inspected by all architects as a durable and artistic material for decoration.

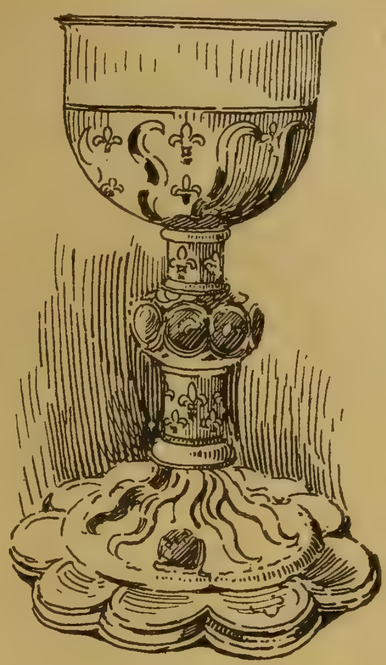
Near we see a stall in which Messrs. West and Collier, of Hambledon, Henley-on-Thames, have a collection of church furniture made in woodwork. We here see some substantially made chairs, litany desks, sedilias, lecterns, and pulpits, seats in oak, and other woods; also altar furniture, crosses, &c. These are simple and well made, and as an inexpensive mode of furnishing poor churches, mission buildings here and in our colonies, nothing could be better adapted. The church chairs are excellent.

Messrs. Salviati, Jesurum, and Co., Ltd., of Regent House, Regent-street, have a choice collection of real Italian lace, brocades, tapestries, and embroideries, in addition to the Venetian mosaic, so well known. One piece of real Venetian lace is valued at £1,000. Another firm, Messrs. Barkentin and Krall, goldsmiths and workers in metals, of Regent-street, has a case of beautiful metalwork. A silver processional cross of elaborate and very rich design, jewelled, and several altar crosses, Communion plate, gilt, jewelled, and enamelled, are in this collection.

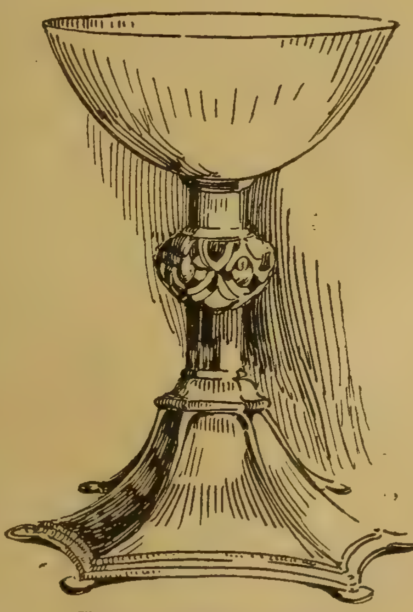
Messrs. S. Clarke and Co., patentees, manufacturers of the patent siphon stoves, Park-street, Islington, exhibit several kinds in operation, both for gas and oil. The Siphon Hygienic gas stove has been described before in these pages; it is an economical heater, and, as no flue is necessary, it can be placed anywhere where heat and light are required. For halls, conservatories, bedrooms, showrooms, &c., these stoves are very economical. The varieties made are numerous—some are incased in Doulton ware, others of enamelled iron, some are oblong, and others of tubular form; those constructed to radiate downwards are decorative, and are fitted with porcelain tiles, &c. The stove is made in several sizes, either in bronzed iron or with copper columns. In some of them a hot plate is fitted on the top for boiling kettles.

The Venice and Murano Co., of St. James-street, S.W., and Venice, have on view some splendid examples of mosaic working, for which the company justly has such high repute, among their latest works being the treatment of the semi-dome of apse at the Guards' Chapel, Wellington Barracks. They have also a choice collection of artistic examples of other Murano productions and Venetian glass-blowing.

We have only space to simply refer to the Loan collection, the most complete of its kind that has been exhibited in London. The church plate is, as we have said, rare and perfect. It represents a few pre-Reformation examples found in London, as well as a complete series of typical examples of Communion plate made during the last 300 years, Edwardian and Elizabethan as well as later plate. The chapter by Mr. Edwin Freshfield, Jun., on this collection, and the descriptive notices in the guide are worth attention. We can only call attention to a few specimens. Dr. Edward Clapton, F.R.G.S., sends a very beautiful casket, designed by the late Mr. William Farmer, of the firm of Farmer and Brindley. The enamelling on the lid was executed by Messrs. Hart, Son, and Peard, and the pieces of wood composing the casket came from the Holy Land. The panelled sides contain carvings of Biblical subjects. The casket contains a collection of precious stones, chiefly those mentioned in the Bible. On the sides of the room are hung some very choice brass rubbings. The collection lent by Henry E. Franks is very fine; Nos. 233 and 232 are especially fine brasses. One collection lent is by Rev. Archibald Paterson, Richmond, in "Delamere yellow" washed with Delamere black, and mounted on stone-coloured paper. We see rubbings of brasses of Sir Roger de Trumpington, A.D. 1289 (XVII. Edward I.); Sir Edward de Bures, 1302, Acton Church, Suffolk; a Priest in Eucharistic Vestments, 1360 (Edward III.) Wensley Church, Yorks; another priest in Merton College Chapel; of Thomas Cranley, Archbishop of Dublin, under a canopy, New College, Oxford, 1417, &c. The Mediæval brasses representing priests in Eucharistic vestments are valuable as examples of embroidered chasubles, collars, stoles, amices, albs, maniples, and we refer the student of ecclesiology to the collection lent by Mr. F. R. Fairbank, M.D., F.S.A., Dorking. Episcopal vestments are also shown, as in No. 561, and processional vestments in Nos. 562-564. The vicar and churchwardens of St. Benet's, Queen Victoria-street, send two very fine silver-gilt repoussé alms-dishes, 1712, of foreign character. Mr. John Hart sends a fine specimen of old Venetian rose point lace, Foxe's "Book of Martyrs," &c. We illustrate three fine specimens of plate: No. 1 a quaint hammered silver cup supported on three elephants, lent by Mr. M. Hulton Harrop, of Lythwood Hall, Shrewsbury. In the cover is inserted a Danish coin of 1642. It is said that this cup has been at one time in use in a monastery, or it might have been in the possession of a member or official of the Danish Order of the Elephant. In No. 2 we illustrate a silver-gilt chalice and paten (15th century) from the church of St. Faith, Bacton, Herefordshire. It is thought that this chalice was made by the same hand as the celebrated Nettlecombe chalice, which is by Mr. Cripps thought to be the oldest English hall-marked plate known. The date is put at 1470, older than the Nettlecombe chalice. On the foot is stamped contrary to Mediæval custom, the name John Coputt, probably the donor. The chalice is in regular use.



Chalice from St. Kea, near Truro.



Chalice from Bacton, Hereford.

Our illustration 3 is a silver-gilt chalice and paten from the Church of Kea, near Truro, of early 16th-century date. The chalice is one of the few pieces of Paris hall-marked plate. The eight medallions round the knop have busts of the Apostles, and are enamelled. The foot is peculiar in design, and adds to the interest of the piece. The reproduction No. 4 is a broken chrismatory, used during the rite of baptism, and intended for holding the oil. The material is coarse terracotta, and Moorish in design, and was found in the moat of an old hall near Langton Rectory. It has two wells—one for salt and the other for oil, and these were roofed over; the roof of one with the spout is broken off. Canon Benham, D.D., of St. Edmund the King, E.C., sends some interesting plate; Henry Wagner, F.S.A., sends a head of a processional cross (663), silver-gilt *repoussé* in high relief, floriated crosses of wood, overlaid with thin plates of metal gilt, engraved with medallions and green and red glass (664 and 665). These have interest. Other specimens of Communion plate (439, 618, 472-477) are interesting for their design and ornament. The collection of crosses lent by Mrs. W. A. Oxley, of Petersham, Surrey, including specimens of French, Italian, Spanish, Russian, and other make, is very interesting. The collection of staves, wands, and maces is a fine one. The collection of books of devotion, Prayer-books and primers, of the 15th, 16th, 17th, and 18th centuries are remarkable and rare; also the MSS. and Latin Bibles and other works of the 13th, 14th, 15th, and 16th centuries lent by Dr. Copinger. As examples of modern embroidery we must notice the splendid altar frontal for St. Cuthbert's Church, decorated with "angels and archangels and all the company of heaven," from the Rev. E. Geldart's design, worked by the St. Margaret's Guild; and also the richly-worked chasuble and cope from St. Matthew's, Earl's Court.

THE ARCHITECTURAL ASSOCIATION.

THE fifty-third session of the Association was inaugurated on Friday evening, when there was a large attendance of members to hear the Presidential address and to witness the distribution of prizes. Mr. G. B. Carvill, hon. sec., read a list of thirty-three nominations for membership.

A GRATIFYING REPORT AND BALANCE-SHEET.

Mr. W. H. Seth-Smith moved the adoption of the annual report and balance-sheet. He remarked that it was always a pleasure to do so when, as on this occasion, the balance-sheet showed a total on the right side. The Association was now in a sound and stable position financially, and, so far as could be foreseen, this improvement promised to be permanent. Matters had been placed on a satisfactory basis, especially on the educational side. The report again showed an increase of membership to the extent of 52 over the preceding year, and this was due to several reasons, one being that a good many old members had rejoined, while there had been fewer resignations than usual; and although the committee were stricter as to payments, they found this had no deleterious effect on the numbers. They had again received the generous gift of £100 from the Institute, which had proved most useful. A capital Common Room had been provided at the Studio in Great Marlborough-street—an improvement due to the President, who had given them the handsome clock which adorned the room. The papers and discussions of the past session had been of exceptional interest; indeed, no other like body brought such excellent and practical papers before its members. He appealed to members to assist the library, which was in great need of new books. The attendances in the classes had been exceptionally good, some of the students not missing a single meeting.

Mr. Francis G. F. Hooper seconded the motion, observing that the only matter for regret in the report was that some of the prizes had not been awarded owing to the want of competition, and he hoped students would be stimulated to prevent the recurrence of such failure.

The motion was caried unanimously.

Mr. Hampden W. Pratt, ex-president, proposed a vote of thanks to the hon. auditors, Messrs. J. W. Stonhold and W. E. Davis, and this was agreed to, as was a vote of thanks to the donors of books to the library moved by Mr. Carvill.

The President (Mr. G. H. Fellowes Prynne) announced that Messrs. G. Collins and C. A. Kelly had been reinstated as members. He also stated that under the rules Messrs. A. H. Hart and H. A. Satchell, being lecturers, had resigned their seats on the committee. They were, however, eligible for re-election, and he would move that they be re-elected—a motion carried with applause. The President further moved a vote of thanks to the R.I.B.A. for their renewed gift of £100 towards the expenses of the classes, remarking that while the Association appreciated this generous help, they felt that they had some right to expect such a donation, as they supplied them with very many students for their examinations.

Mr. Carvill announced that the annual conversazione would take place on Friday, the 20th inst., at the King's Hall, Holborn, and gave particulars of the various classes about to be started.

PRIZE LIST.

The President then distributed the medals and books awarded to students for the past session's work in accordance with the following list:—

A.A. Travelling Studentship, value £25, and bronze medal, D. T. Fyfe; second prize, value £5, H. Tanner, jun.; hon. mention, H. Farquharson.

A.A. Medal, not awarded; prize, value £5 5s.; H. Tanner, jun.

Andrew Oliver Prize, value £5 5s., G. J. T. Reavell.

Arthur Cates Scholarship, C. L. Fleming-Williams.

Lectures.—Division I.: Silver Medal and A.A. Scholarship, value £6 6s., P. J. Westwood; bronze medal, A. R. Conder; hon. mention, H. J. Worrow. Division II.: Silver Medal, P. J. Turner; bronze medal, H. S. Barrett; hon. mention, R. H. Spalding.

Studio.—Division I.: Silver Medal and one Vol. of the A.A. Sketchbook, S. V. North; bronze medal, A. A. Carder. Division II.: Silver Medal, A. Symon; bronze medal and one Vol. of the A.A. Sketchbook, G. H. Jenkins; hon. mention, W. J. Davies.

ORDER OF MERIT.

Division I.—Greek and Roman Orders: C. H. R. Henman (certificate), S. V. North, P. J. Westwood. Elementary Construction: P. J. Westwood (certificate and book), B. Greig, A. R. Conder. English Architecture: P. J. Westwood (certificate and book), A. R. Conder, G. L. Elkington. Mediæval and Renaissance: S. H. Goodwin (certificate and book), B. Greig, S. Bridges. Elementary Physics, Formulæ, and Calculations: H. J. Worrow (certificate and book), P. J. Westwood, B. Greig. Plane and Solid Geometry: W. A. Jeckells (certificate and book), A. R. Conder, H. J. Worrow.

Division II.—Materials, their Nature and Application: T. G. Chambers (certificate and book), H. S. Barrett, P. J. Turner. Construction: P. J. Turner (certificate and book), R. H. Spalding, A. S. Dorrell. Drainage and Water Supply: P. J. Turner (certificate), P. B. Dannatt, J. E. Franck. Ventilation, Lighting, and Heating: J. E. Franck (certificate), S. H. Goodwin, P. J. Turner. Professional Practice: P. J. Turner (certificate), S. H. Goodwin, J. E. Franck. Elementary Class of Design: First prize, value £1 1s., with silver medal and certificate, R. Knott; second prize, bronze medal and certificate, E. S. Collins; hon. mention, E. Brantwood-Muff. Advanced Class of Design: First prize, value £1 1s., with silver medal and certificate, J. A. Swan.

The President then delivered his

OPENING ADDRESS.

Having expressed thanks for his re-election to the chair, Mr. Fellowes Prynne acknowledged in cordial terms the aid and support given him by the members of the late committee, and also by the hon. secretaries, Mr. Howley Sim and Mr. G. B. Carvill, and the secretary, Mr. Driver. Nothing could, he added, have exceeded the harmony and good will that had existed on all sides. There had been no single note of discord, and he thought they might fairly congratulate themselves upon the

EXCEPTIONAL, ALMOST PHENOMENAL SUCCESS,

both from a working and financial point of view, of the past session. First, as regards membership, the roll of members is, continued the President, the highest on record, and the total now exceeds 1,250. That our financial position is equally sound and satisfactory may be judged from the fact that, in spite of necessarily increased expenditure, we are able to carry forward a record balance of not less than £224 odd to our premises and general fund.

THE SCHOOL OF DESIGN.

In my opening address last year I called special attention to the work of the Studio, and more particularly to that branch of its work that most closely binds us with the Association, and is still most closely allied to the voluntary system of teaching—the School of Design. I then pointed out that the committee had been a good deal puzzled to find out the cause for the general falling off in the membership and work of this once popular class, and expressed the earnest hope that the alterations made as to the fees, and the working out of designs, would make the work of that class more really representative of the work of the Architectural Association. These hopes have been more than verified, and it is most satisfactory to find that the efforts of the committee have succeeded in making both the elementary and advanced classes of design as they should be, not only the most popular, but one of the most useful classes in the whole system of the work of the Association. As against the numbers of 22 and 12 students who joined the elementary and advanced classes of design respectively in the previous session, no less than 78 and 17 students joined during the last session. This success was not confined to numbers only; the work done showed a great advance on that of some previous years, and some designs sent in were of considerable merit. The interest and enthusiasm, was, however, partly perhaps owing to numbers, better sustained in the elementary than in the advanced class. It is hoped that this may be remedied in future years, as the committee, profiting by the experience gained during the last session, have wisely decided to make the subjects in the elementary class somewhat more elementary in character, with the view of inducing all students to join the elementary class in their early years of study, and, as a matter of course, to follow on into the advanced class, which in future will not be an advanced class in name only. I most sincerely hope that all students who joined the elementary class last session will rejoin the school of design this year, and continue their studies, either by going on into the advanced class, or remaining for another session in the elementary class of design, as I cannot too strongly urge upon students that it is not by one or two flashy, or perhaps even clever designs, made in a single session, by which their work will best be judged, or that will be of most value to them; but by carefully giving their attention to the smallest details in design, and methodically following on their work stage by stage for two or three sessions. "Do little things now," says a Persian proverb, "so shall big things come to thee, asking to be done."

VISITORS' CRITICISMS.

It is no small thing for students to be able to get the advantage of criticism upon their early work freely and ungrudgingly given by many of the well-known artists whose names appear on our visitors' list, and I cannot too strongly advise them to get as much out of those visitors as they possibly can while they have the chance. Those who were present at the first meeting of the studio on October 11th last year will have appreciated the innovation of opening the session with short informal addresses to students, when Mr. Aston Webb and Mr. Cole Adams so kindly gave us their valuable support. This meeting inspired very genuine enthusiasm amongst the students, both old and young, and Mr. Aston Webb's useful hints on planning, and warm and sympathetic remarks in reference to the class of design, will long be remembered by all who heard them. While mentioning Mr. Aston Webb's name, I cannot refrain from referring to the well-deserved honour bestowed upon him by the Royal Academy. No election made by that body has ever been more popular in the ranks of the A.A. than that of our past president and warm supporter, Aston Webb, and no congratulations offered to him are more sincere and hearty than those offered by the members of our body.

TIME SKETCHES.

While referring to the studio work, which has been so thoroughly and ably carried forward by Mr. W. G. B. Lewis, assisted by Mr. De Gruchy, I must commend to the notice of students the admirable system of time sketches started during the last session by Mr. Lewis. These sketch designs, made under the direct supervision of the instructor, will be found most valuable, especially to younger students. The system will help in giving them method in their earliest attempts at design, and so render their future efforts in design more direct and effective. Encouraging as the students' work in the studio has been, there is

ROOM FOR IMPROVEMENTS.

The danger of working with no higher aim than to make drawings sufficiently good for qualification in the R.I.B.A. examinations or for admission to the R.A. is a real one; and the falling off in the attendance towards the end of the session shows a lack of appreciation, on the part of some students, of the greatness of the work that lies before them, and of the necessity of thoroughness and methodical perseverance in their studies. Another branch of the studio work that is not receiving the support of students in a manner which the importance of the subject demands, is the modelling class. This is all the more extraordinary, as we still retain the valuable services of our friend Mr. F. W. Pomeroy as instructor, who is second to none in his art. But the committee have, as usual, gone to the root of the matter, and recognising that the argument of £ s. d. is found to be the most clinching of any, have decided to reduce the fees for the modelling class for students attending the studio to less than one-half the original fee, while any other member of the Association can now obtain the best instruction in modelling at the nominal fee of 12s. 6d. Surely a valuable class, such as this, will not languish for members during future sessions. With regard to the lectures, I am glad to say that the average attendance has been well maintained, and that we are fortunate in retaining the valuable services of our many able instructors. The Land Surveying and Levelling Class was not held, owing to the small number of entries. But considering the multifarious subjects the architectural student has to face nowadays, one is not surprised that this practical subject of land surveying should, in some sessions, not receive the support it deserves. It must, however, be evident that to a large number of architects a knowledge of the subject is most useful, if not essential. An excellent new level has been purchased for the use of future members of this class. With regard to other useful branches of work, I should like to call attention to that of

THE CAMERA CLUB.

It was decided last session to commence a really useful collection of lantern slides of architectural subjects, which would not only be useful to lecturers, but also to readers of papers, in illustrating their subjects. Now, any members of the A.A. who are amateur photographers can help us greatly by either sending to the secretary of the Camera Club any good negatives they may have of ancient buildings or architectural detail, or—still better—by sending lantern-slides already made. We are anxious that the collection shall be very comprehensive in character, and at the same time good in quality. All negatives or slides sent will go before a sub-committee for careful selection. The great value of such a collection will at once be apparent to any who have had experience in the difficulty of obtaining suitable slides to illustrate papers on art generally, and architecture in particular.

CHANGES IN THE PRIZES OFFERED.

Certain alterations have been made with regard to prizes. Medals will not be quite so common as before, and will consequently perhaps be more valued, and a larger number of book prizes will be offered. For some years there has been no competition for the prize of £10 kindly offered by the Architectural Union Company for the best set of measured drawings. Some years ago this prize used to be competed for regularly, and the reason for its being neglected now is quite incomprehensible to myself and others. A more useful subject for competition it would be difficult to conceive. The Architectural Union Company do not offer this valuable prize just for the fun of the thing, we may be sure, and the company have been very generous in allowing the conditions to be altered in the most liberal spirit; we cannot therefore be surprised if the offer of a prize is withdrawn should no competitors be found during the coming session. The review of the work of the session would be quite incomplete without some mention of

THE SOCIAL SIDE.

We have to thank the members of the entertainment committee for giving us a practical demonstration of what an excellent entertainment the members of the A.A. can produce. Not only was the last soirée a great success, cleverly conceived, and brilliantly carried out, but it was free from anything that the most carping critic could term vulgar or even commonplace. Nothing but good can result from this healthful relaxation at our annual soirée. The cycling club has been resuscitated, and the runs will in future be made as far as possible in connection with the summer visits and camera club.

Perhaps the most useful addition made in connection with our social work is the new common room. I do not quite know whether to describe this little addition as a foretaste of better things to come, or as an apology for not yet getting something better. The committee without in any way abating their individual and collective efforts to find suitable new premises, have fully realised the difficulty of so doing, and in taking and furnishing the new common room, have not only had the immediate comfort of the members in view, but the business interests of the Association, as with the front room, the present premises have a commercial value, which would render the disposal of the lease, at short notice, a comparatively easy matter.

THE NEED FOR NEW PREMISES.

My most sincere wish when I last addressed you was that during my year of office I might be able to announce that new premises had been obtained, which would not only give ample accommodation for our regular work in studio and classrooms, and for our social requirements, but would provide demonstration workshops for the craft side of our work. No stone shall be unturned and no time or energy stinted by myself during the present session in trying to satisfactorily solve the difficult question of new premises. I shall not be divulging committee secrets when I hint that we have a large scheme at present under consideration, but I have had too many disappointments under this head to be over-sanguine of success in the present instance. It is, I fear, too much to hope that it may fall to my lot to announce the good news that new and worthy premises have been found, but I sincerely trust that such an announcement may be made early in

THE NEW CENTURY.

The New Century—what a strange influence these purely arbitrary divisions of time seem to have upon our minds, and even upon our actions—an influence that I cannot but think is for good in many ways. This session of the Architectural Association is, as it were, a bridge between the 19th and 20th century, and as we draw near to the apex of that bridge or line that divides the two centuries, who is there amongst thoughtful men who will not tarry a moment to look back on many wonders wrought during the last century—wonders in science that for better or for worse have transformed the face of the whole world; wonders in literature, poetry, and music that have left the world far richer than they found it; wonders in art that will influence artists for centuries to come; wonders in architecture—yes, even in architecture, for better or for worse. In all these wonders of the 19th century have we not infinite scope for reflection, study, and encouragement. Most strongly would I advise our students not to content themselves with only reading that which immediately concerns their own particular branch of art. If they would learn what real industry and perseverance means, and what it has accomplished, if they would know what little things have led to great results; in short, if they would learn the highway to success in life, let them, as a relaxation, read the interesting biographies of those who have brought about the wonders I speak of.

NINETEENTH-CENTURY ARCHITECTURE.

In the more limited sphere of our beloved art, what a strange and interesting page in the history of the century might be written thereon! The task of writing it will probably be undertaken by some enterprising author before long, and if carefully done, there should be ample material for an extremely useful and interesting volume, although the difficulty of following through the various fashions and heterogeneous vagaries of the last hundred years would be great; but if episodes in the lives of the leading architects who have gone before, but left the stamp of their genius on many buildings, great and small, throughout the land, could be collected and incorporated, such a volume would, I feel sure, be much appreciated. The danger, of course, for anyone reviewing the earlier work of the century is that we are too apt to judge work from our present standpoint. Few seem to be able to make allowance for the wholly different state of things existing, architecturally, in the earlier part of the century, and condemn those whose names, in their day, were looked up to by all. Are we, in these days, so sure of our own ground that we can afford to severely criticise a style of work that does not exactly coincide with our enlightened views of style? If we, as a rule, tried to find out the good points of a brother architect's work, instead of finding a kind of pleasure in picking out what we conceive to be the bad points, it would be better for ourselves and the profession at large. In saying this, I do not wish that proper criticism should be curbed in any way. There is, of course, criticism, *and* criticism. For instance, a bad plan—misapplied ornament—palpable ignorance in detail, and bad proportion in building, poor construction or bad workmanship of any kind, &c., in which cases severe criticism is most desirable, and even helpful, in that it makes one to remember what to avoid. But there are few buildings that one takes the trouble to visit that have not some good points in design or planning. Try then and find out those good points, and put away the bad ones as much as possible on the principle that "you never touch mud, but some sticks." There are numerous good points to study in the lives and works of the many able architects of the century. Architecture, as a great art, was in a measure dead in England at the commencement of the century. In what may be called the stucco period, a bastard Classic and Gothic style was the order of the day. What seemingly insuperable difficulties had to be faced by men who longed for a better state of things? What study, energy, patience, and enthusiasm was necessary to overcome the difficulties and prejudices existing? With much of the work done in the early stages of the great Architectural Revival, we can have but little sympathy; but we can at least appreciate the motives that undoubtedly inspired men to aim at a higher ideal than was then prevalent. It would be hard to over-estimate the enormous influence that such books as Rickman's "Attempt to Discriminate the Styles of Architecture in England," first published in 1817, together with the early publications of Parker, and followed by the writings of Sharpe, Paley, Pugin, and Brandon, have had upon the architectural history of the century. The earliest of these works prepared the ground for

THE GREAT GOTHIC REVIVAL

that followed in the forties, and following decades. We must remember, however, that this great revival was not brought about by architects only: it came like other great movements, in answer to needs and requirements of the times; it moved concurrently with the great religious revival that commenced at that period, it took firm root in the great seats of education, our universities, with the result that it influenced the minds of both clergy and laymen, who then took up the study of architecture with a thoroughness and zest that would shame many a student of the present day. With such able men as Barry and Cockerell living, the best traditions of Classical work were not likely to be lost; but it is the great Gothic Revival in its various phases by which the 19th century will be most closely remembered architecturally. It has lately been the custom to talk slightingly of this revival, and of those great and able men who guided its destinies. But to do so is neither just nor generous. The underlying principles that prompted such men as Rickman, Parker, Pugin, Paley, Scott, Street, Burges, Butterfield, Pearson, and others in their writings and their work, were of the highest and noblest character. These men spared neither time nor trouble in trying, by means of the most careful study of detail, to get into touch, as it were, with the artists who in past ages had left us buildings of such surpassing beauty. We may quibble and find fault with the doctrines of the early purist, who, in his enthusiasm to truthfully follow the best detail of Mediæval times, fixed arbitrary limits of right and wrong and good and bad in styles, yet in doing so he was only working on the same lines as the purely Classic student, who is not content without giving verse and chapter for the proportion of every column and detail used. As in most revolutions, men are carried further than originally intended, with consequent injury to the cause they uphold, so undoubtedly in the Gothic Revival much irreparable evil was done by the excess of enthusiasm, under the name of restoration, with the same detrimental effect to the cause they held dear. But the first principles of the originators of the movement being essentially good, much good was bound to result from it; and there are few architects living whose work has not in some way been influenced for good by the great minds that were connected with the Gothic Revival.

PRESENT-DAY ECLECTICISM IN ARCHITECTURE.

Fortunately the arbitrary shackles of style no longer bind us to rigid regularity of lines and detail. Men of great power and genius, whose early tuition was received in the Gothic school, have been amongst the first to lead the way in originality of thought and design—such as the late John Sedding, for instance. I have purposely avoided mentioning the names of living architects, amongst whom there are many worthy successors to the genius of the past, but I cannot refrain from mentioning one whose early training was also in the Gothic school, and whose work has had such untold influence on the domestic architecture of this century—I mean Mr. Norman Shaw. A study of his past and present work is a wonderful object-lesson in development; but from first to last, whether it be in domestic, public building, or church design, always powerful, always thoughtful, and always artistic. The hard and fast conditions of style having been, by a sort of general consent, removed—what has been the result upon our art?—is the result satisfactory? In some respects, yes, in that the minds of clever men are given a freer scope for originality, or an eclecticism that is charming, from the very boldness and knowledge it displays. In many respects, no, in that it gives an excuse for ignorant and badly educated men to thrust upon us such

ARCHITECTURAL ABOMINATIONS

as have lately been allowed to disfigure some of the best streets in the Metropolis under the false name of originality and eclecticism. Emerson says somewhere:—"Great licentiousness treads on the heels of reformation"—and in architecture we cannot claim exception to this rule.

THE OUTLOOK NOT HOPELESS.

But in spite of the glaring and vulgar designs that too frequently crop up in our midst, I cannot agree with those who say that the architecture of the day is in a hopeless state. On the contrary, from the energy and enthusiasm that is being displayed on all sides in art generally, we may take a very hopeful view of the future. Speaking generally, the design and planning of our public and private buildings show a great advance in many respects. Our churches are no longer slavish copies of Mediæval work, and many of our houses and their decorations show an honest and often successful striving after better design in all that surrounds us. But there is one class of building which, from its position and acres of ground that it covers, that has during the present century assumed a far greater importance than is its due. I mean

THE MODERN VILLA

or suburban residence, built by speculative builders, that surrounds us on all sides. What a terrible legacy of ugliness and bad building shall we leave behind! what a wilderness of worthless bricks and mortar! The demands for this class of building caused by the new kind of life in the present century have, of course, had to be met; but, artistically speaking, how unequal we have been to the task of meeting those demands! How far we, as architects, are responsible is a question that it would be impossible to answer; but this is certain—that if we compare the ordinary present day suburban house with a similar class of work carried out even in the last century, the comparison is by no means favourable to us. The 18th-century builders, as a rule, did not sacrifice good building to tawdry ornament. Their buildings were generally substantially built, and even if at times commonplace, were at least quiet and reserved in design, and seldom if ever bespattered with the ghastly shams—vulgar terracotta ornament and worse than worthless carving. The modern house of the kind is too well known to all to require any description. It assails us in all directions, not only in the suburbs of London, but in the neighbourhood of all our large towns. Nay, more, it is a disease that is contagious, and even the beauty of our homely villages and country roads is disfigured by its unwelcome presence. I do not say that this class of building was always good in past centuries, or is invariably bad at the present day; but there never was a time in which all that is true and good in building, and all that is pure and best in our art, was assailed by a more dangerous, insidious, and potent enemy than the demand at the present day for cheapness and showiness in our buildings, and apparent indifference of the general public as to the artistic merits of the houses they live in.

THIS MASS OF DREARY UGLINESS

that most of our people have to live amongst must act and react upon the mind, and do incalculable harm to the cause of art. The question is—How is the evil to be grappled with? (1) by setting the example of quiet reserve in our designs, and avoiding as far as possible the outward display of ornament; and when we do have ornament, seeing that it is the very best of the kind that we can get—and above all by never under any condition sacrificing solidity, or the use of the best materials, for the sake of being able to get more ornament in our buildings. (2) By doing everything in our power to influence landowners, when leasing or selling property for building purposes, to insist on the insertion of a condition as to some sort of supervision by a qualified architect. What an opening there is for early practice in this field of design for some of the aspiring members of our School of Design! It is not necessarily an expensive house that we desire or ask for. On the contrary, if the demand for small houses is to be met, every reasonable and proper economy must be most carefully studied. I can well imagine a roughcast cottage being quite as good in design as a stone building five times more costly. Our aim should be to demonstrate to the public that a comfortable, artistically designed, and substantially-built house, does not necessarily mean a building that is more expensive than the ill-built erection at present so common, in which so much money is frittered away in utterly vulgar ornament.

CO-OPERATION OF ARTISTS AND ARCHITECTS.

During the last years of the 19th century the great necessity of a closer union and sympathy between artists and architects has been very strongly brought home to us. The objects of the opposition that we as architects have offered to the work of decoration of St. Paul's Cathedral must not be misunderstood. Most of us desire that our great churches and national monuments should be decked with the very best of all we can offer in art, be it in colour decoration or in sculpture. It cannot be made too clear that our opposition is on purely architectural grounds. I am convinced that the Dean and Chapter of St. Paul's when they started the work of decoration had but one wish, that what they did should be of the best; and I am further convinced that Sir William Richmond entered upon this great work in the same spirit. But, surely the first qualification of any artist entering upon such a work is that he should be in complete and absolute sympathy with the architecture of the building he proposes to decorate. The results have proved that this is unfortunately not the case. Is it then unnatural that we should raise our voices against the injury done to the work of one of the greatest architects England has ever seen? As architects surely it is our duty to do so, and as Englishmen we have a right to ask that the walls of our great national monuments shall not be treated as mere spaces for artists, however clever, to experiment upon. I believe, however, that there is a growing sympathy between artists and architects, and the more we can do to foster that feeling the better it will be for art generally.

SYMPATHY BETWEEN ENGINEERS AND ARCHITECTS.

I could wish for the same kind of sympathy, in a different way, between engineers and architects, especially with regard to the bridges crossing the Thames, most of which are a standing rebuke to us as a nation. What we desire is, that in the designs of bridges, involving an expenditure of a large amount of public money, and affecting as they do the appearance of our grand water-way, architects of eminence should invariably be consulted as to the architectural work, while the constructional work could, if so desired, be placed in the hands of well-known engineers. In such works in Paris, architect and engineer work together as a matter of course—why not in London

THE AIM OF THE ARCHITECTURAL ASSOCIATION.

For the last half-century the Architectural Association has been working with one pure and high aim—the advancement of architectural education. A voluntary association dependent almost solely on voluntary help and energy. A free and independent association, unfettered by bonds of professionalism or social class ties of any kind. A social association, in which architects, young and old, rich and poor, can all meet together on one level, in social intercourse and good fellowship, and withal a successful association. What, it may be asked, has been the lever of success? Has it been by capital or financial help given by persons or public bodies interested in educational work? In no sense, with the exception of the yearly grant of £100 so kindly made by the Royal Institute of British Architects, and the very generous donations given by some well-known architects at the launching of the new scheme of education. No, the lever of success has been the sincerity of purpose, the unselfish devotion to the cause, the single-hearted aim and warm enthusiasm of its originators and supporters. As long as men are found to help in carrying forward the work with the same high aim and enthusiasm, so long will the Architectural Association flourish and carry forward its great work with increasing vigour and helpfulness. We, the elder members of the A A., have reason to fully recognise the value of both the educational and social work of the Association, but under the new system of education its value has increased tenfold; and it is for you, the younger members, to prove that its value is still greater in the future than in the past. It is a healthy sign that so many of our older members continue their membership, and I again appeal to all who are interested in the objects of the A.A. to join our ranks and help us by their membership and advice. When the members of the last excursion were visiting Bryanston, Lord Portman, seeing some elderly gentlemen in our party, asked me if the association was composed entirely of students. I answered Yes, that in our party of 28, there were students whose ages ranged from nearly 60 to 18, from men who had been in practice for 25 years to pupils in their offices. So comprehensive are the ranks of the A.A.

AN APPEAL TO THE YOUNGER STUDENT.

In drawing this address to a close, I would ask the younger students of the present day to remember how great is their responsibility. Upon them in a great measure will depend the making or marring of the architecture of the 20th century. It is impossible to foretell what their chances and opportunities may be, and equally impossible to foresee what will be the characteristic style of work of the century, and therefore it is useless to speculate upon the matter. But be sure of this—there is no broad highway of success that is not founded upon the work and experience of past ages. We are not gods, that we may create something out of nothing, but creatures who must make the best use of the materials and gradually growing knowlodge vouchsafed to us by a bountiful Creator. Experience teaches us that to succeed at the present day a man must concentrate all the faculties of his mind on one great purpose, and with an unswerving tenacity of purpose. A great purpose is cumulative, and, like a magnet, attracts all that is kindred along the stream of life. The question is, Can you honestly say that you do, or that you wish to, make the art of architecture a great purpose in your life? If so, and you work conscientiously with that aim, I can safely prophesy your future success and happiness; but, if not, you had far better turn back, and give up all idea of becoming an architect. At best it is a hard-worked and ill-paid profession, and if one's heart is not in the work, it becomes a mere existence without a soul. I do not for one moment wish to discourage those who are commencing their studies in the art. Far from it. My one great wish is to inspire enthusiasm amongst students who possibly have not realised fully how great is the work before them, and how great is the need of working consistently with one definite purpose. Believe me, I have no wish to make or exaggerate an evil. The evil I speak of—want of enthusiasm—undoubtedly exists amongst some of our students. Far too many make the end and aim of their work to qualify for the R.I.B.A. examination. But good as these examinations are in many ways, you must not for one moment think that the passing of examinatious will make you an architect in the truest sense. The key to the success of an architect is that his heart must be in his Art. Ruskin truly says: "Fine art is that in which the hand, the head, and the heart of man go together, the head inferior to the heart, the hand inferior to the heart and head." Thus it must be the heart that dictates your actions, or, in other words, real love of art for art's sake that must be your incentive to work. If, as Longfellow says, "enthusiasm begets enthusiasm," then may I hope that my enthusiasm in the cause I am pleading may be imparted to you, and that your enthusiasm once fired may be imparted to others. In conclusion, if you love art for art's sake you will not be content with obtaining knowledge and success for yourself alone, but will take pleasure in imparting knowledge to others and thus helping forward, step by step, the great work of architectural education. I cannot end with better words than those of Shakespeare—

> This above all, to thine own self be true,
> And it must follow, as the night the day
> Thou canst not then be false to any man.

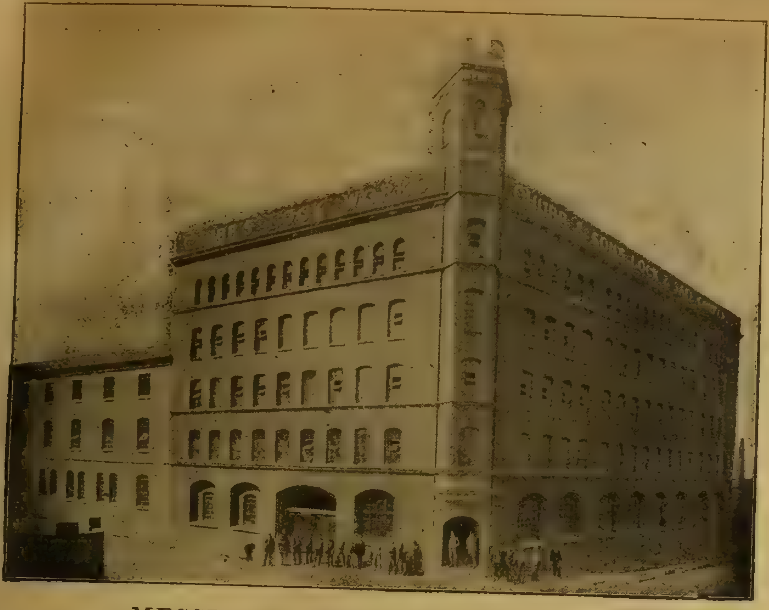
Mr. H. L. **Florence**, past-President, in proposing a vote of thanks to the President for his address, observed that the old French architect, Philibert de l'Orme, referring to the many trades he needed to master, said that the architect should have three hands, four eyes, and four heads; but he wondered what he would have said if, instead of writing in the 16th century, he had lived at the end of the 19th century! He probably would have desired for the architect a lengthening of his years. The speaker emphasised the value and importance of systematic education, and referred with high approval to the methods in vogue in France.

Lieut.-Col. **Lenox Prendergast** seconded the vote of thanks, which was carried by acclamation, and briefly acknowledged by the President.

ART IN CHURCHES.

THE Clergy and Artists' Association Exhibition, the fourth during the Church Congress, held at Leighton House, Holland Park-road, W., a very excellent collection of sketches, cartoons, models, and working experiments for art in churches is to be seen. In many of these studies for the completed work we see the true spirit of the artist manifested, and the art atmosphere of such a house as that of the late Lord Leighton's contributes to the success. We can only here notice a few of the chief exhibits. Mr. Reginald Hallward, the hon. sec., and Mrs. Hallward, send many beautiful studies. The sketches for chancel decoration, Ingrave Church, Essex (10); the altar-piece for St. Paul's Church, Bury; drawings of details for St. Alban's, Teddington; glass window for baptistery, St. Etheldreda's Church, Fulham, and other designs are full of the right spirit, devotional and technical, as a banner for St. Etheldreda's, designed by A. H. Skipworth, worked by Mrs. Hallward. Miss Maud Berry's design for a chancel arch, showing the procession of saints and martyrs on each side, and the throned Saviour over the apex, with the angelic hosts above, is clever. A small altar for a private oratory is by Mr. Louis Davis, who also sends a nice design for a school banner (8) and several cartoons for glass windows. Miss Emily Ford's cartoon "The Nativity," in chalk (11); Sir W. B. Richmond's design for mosaic at St. Paul's (13); designs for windows in Kirkley Church, Liverpool, by Henry Holiday; drawings of interior of chapel of House of Retreat, Clerkenwell, by Ernest Newton; and the interior and exterior of St. Etheldreda's, Fulham, by A. H. Skipworth (27); several embroidered banners designed by R. Hallward, and worked by Misses Bloxam; the fine design by F. Watts, R.A., "The Creation of Eve," are of interest; also one or two plaster casts of altar crosses in hammered metal, designed by Chas. Spooner, and executed by R. L. Rathbone and A. Hughes (33 and 35). One executed in silver for Pembroke College, Cambridge, by G. S. Prior, is a very beautiful and delicate floriated cross. The glazed earthenware Crucifixion by Conrad Dresslar (36), who shows also some nice glazed tiles; and works by Miss Hermione Unwin, Miss E. M. Rope, Miss M. Loundes, and W. Bainbridge Reynolds well repay attention. A screen of water-colours, comprising one or two by D. G. Rossetti, Sir E. Burne-Jones, and a screen of embroidery may also be seen. The names of those on the Committee of Direction are a good guarantee of the quality of the work by this association.

Some difficult subaqueous construction is contemplated by plans now being drawn by Mr. Ericson, the city engineer of Chicago. They involve the lowering of the three cable railway tunnels under the Chicago River for depths of as much as 13ft. in places, in order to give the 26ft. of water which the Federal authorities desire.



MESSRS. CHUBB'S NEW WORKS.

NEW WORKS FOR CHUBB'S LOCK AND SAFE CO., LTD.

THE new works of Messrs. Chubb and Sons' Lock and Safe Co., Ltd., at Wolverhampton, were opened yesterday by the Right Hon. the Earl of Dartmouth, P.C., with much *éclat*. The works are built from the designs of Mr. Chas. W. M. Mitcham, of London, who has been assisted in the superintendence of the work by Mr. F. Beck, of Wolverhampton, and occupy a site of about 18,300 superficial feet in an important position in the town, the principal frontage being in Railway-street, and the building is entirely surrounded by public streets. Our view shows a part of the new works, a building about 64ft. high, containing a range of offices on the ground-floor, with a principal entrance at the corner of Railway-street and Chubb-street, surmounted by a turret about 80ft. in height, and consisting of showrooms, manager's, clerk's, and timekeeper's offices, packing-rooms, store-rooms, &c. Above the ground-floor of this part of the building are four floors, each over 200ft. in length; consisting almost entirely of workshops, but containing also additional stores, rooms for the caretaker, a kitchen and dining-room, and on each floor a lavatory for the men. The stairs are of blue Pennant stone, and there is also an external iron fire-escape stair, giving access from each floor down to the interior courtyard, which is entered by a cartway from Chubb-street. Around this courtyard are the doors of the stairs, the packing-room, machine-shop, smithy, and other workshops, various stores and latrines for the men, all in full view of the windows of the manager's room. In a basement under part of this building there are additional store-rooms. The rest of the site is occupied by a very large workshop with frontages to Fryer-street, Chubb-street, and Long-street, and having a floor area at the ground level of about 7,000super.ft., surrounded by two tiers of galleries, each about 240ft. long by over 20ft. wide, supported by steel stanchions and girders. The interior height of this building is about 44ft. It is approached by a cartway in the courtyard and another in Fryer-street. The principal fronts are faced with Stourbridge red facing bricks; the entrance doorway, the cornices, &c., are of Darley Dale stone; the interiors of offices are lined with hard buff bricks and glazed brick dado. The buildings are warmed for the most part by stoves, and lighted throughout by electric light. The works have been carried out by Mr. Hy. Gough, of Wolverhampton.

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THE A.A. SCHOOL OF DESIGN.

A PRELIMINARY meeting of the School of Design was held at the Studio of the Architectural Association, 56, Great Marlborough-street, W., on Tuesday evening, and was very numerously attended. The President of the Association, Mr. G. H. Fellowes Prynne, occupied the chair, and gave an address of encouragement and good counsel to the students.

Mr. W. H. Seth-Smith, past Vice-President, followed with a thoughtful paper on the subject of the application of architectural ornament, in which he emphasised the point that such ornament ought to be wholly governed by its surroundings. Its proportions, character, and style should be suggested and controlled absolutely by the building. Its relations to construction and material were of great importance and interest. The great aim should be so to utilise ornament in architecture as to give beauty to constructional features. Mr. Seth-Smith laid down and elucidated in detail six main principles which should be considered in the application and distribution of ornament: (1) The rotundity or modelling of the angles—i.e., the mouldings; (2) ornament against high light, including window grilles and tracery and skylines; (3) that the richest ornament ought not to be in the high lights; (4) solidity—that the enrichments, such as the carving, should never be allowed to cut through constructional lines; (5) concentration on the eye-line; (6) and lastly, weathering, for the protection of ornament from injurious effects of moisture and sunlight.

Mr. Halsey Ricardo followed with some excellent remarks on "Detail," in which he pointed out that building and detail were not separate qualities. One could not put up a building, and by enduing it with detail, convert it into architecture. It was impossible to erect a building but what it had detail; indeed, one could hardly put one stone upon another but what it revealed thought or want of thought. Detail depended on the way the architectural problem was tackled, and the knowledge the designer had of the capabilities of the material he meant to use. The more thoroughly an architect entered into the structure of his work, the more interesting detail became. Unfortunately at the present day detail was approached from the academic standpoint, and it became deadly learned and learnedly dead instead of alive and inevitable. In conclusion, he urged students to make their detail interesting, sincere, and redolent of the age they lived in.

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CONVENTION OF AMERICAN ARCHITECTS.

THE thirty-third Annual Convention of the American Institute of Architects will be held at Pittsburgh, Pa., November 14, 15, and 16, 1899. On Tuesday, November 14, an address of the president will be delivered, and reports of committees read in the forenoon. Paper on Electricity, and excursion by special train to the Westinghouse Electric and Machine Company's Works in the afternoon. At the evening session papers will be read on the "Influence of the French School upon Architecture in this Country," by H. L. Warren, of Boston, Mass., A. L. Brockway, of New York, and R. A. Cram, of Boston: The following architects have expressed an intention of discussing this subject:—Cass Gilbert, of St. Paul; F. M. Day, of Philadelphia; R. D. Andrews, of Boston; T. C. Young, of St. Louis.

On Wednesday morning a special train will take the Institute members who attend the convention to the Pittsburgh Plate-glass Works (a paper on the subject having been read at the previous evening session), where the visitors will have the opportunity of seeing these works in operation. At the afternoon session papers will be read on "The Legitimate Design of the Architectural Casing for Skeleton Steel Structures," by C. H. Blackall, of Boston, and H. R. Marshall, of New York. The following architects have expressed their intention to participate in a discussion on this subject: R. W. Gibson, of New York; J. M. Donaldson, of Detroit; Thos. H. Morgan, of Atlanta; R. H. Robertson, of New York. During the evening session papers will be read on "Mural Painting," by E. E. Garnsey, of New York; "Sculpture in its Relations to Architecture," by William Ordway Partridge, of New York; "Architecture and Sister Arts," by Levi T. Scofield, of Cleveland, O.

On Thursday, November 16, the morning will be occupied by the election of officers, and papers are expected from Professor Wm. R. Ware, of New York, on "Competitions," and "The Influence of Jews upon Architecture," by J. W. Yost, of Columbus, O. In the afternoon a paper will be read by F. H. Kindl, Chief Engineer of the Carnegie Steel Works, and the Institute members will be taken by a special train to the mills to view the rolling of structural steel. On Thursday evening a visit will be made to the Carnegie Art Institute. The headquaters will be the Monongahela House.

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CHIPS.

A new organ is about to be placed in the great parish church of St. Nicholas, Yarmouth, at a cost of £3,000, five-sixths of which sum has been raised. The organ will be a divided instrument, the two parts to be placed under the chancel arches and in the position now occupied by the choir seats.

The parish church of Frome has been enriched by the addition of a stained-glass window, being the third of a series recently inserted in the south aisle. The subject chosen is the "Adoration of the Magi," which fills the three lights.

Within the last seven years the population of the Western mining field of Tasmania has risen from 400 to 20,000 souls, and is still increasing. On July 31, 1898, there were over 1,700 residences in the town of Zehan, and over 300 of these had been erected within the preceding twelve months. At Queenstown the number of residences had risen from about 40 in the beginning of 1897 to over 900—and new townships have sprung up at other centres within the past twelve months.

The committee of the North London Hospital for Consumption at Hampstead, in order to extend the system of open-air treatment of consumption, are having a series of balconies erected, at a cost of £3,000. They are so planned that they will form part of the final wing of the hospital, when the committee are in a position to carry out that work; but meanwhile the balconies will be available for immediate use.

Public baths are about to be erected near High-street, Wandsworth, at a probable cost of £36,000. The commissioners propose to adopt the latest type of slipper-baths and fittings, to use rubbed slate with gunmetal fittings for all the divisions and doors instead of wood, to use oak for the dressing-boxes, and erect a gallery in the first-class bath.

Major-General Crozier, R.E., Local Government Board inspector, sat at the town-hall, Torquay, recently, to inquire into the application of the town council for sanction to borrow an additional £10,000 for electric lighting, and £1,100 for a shelter at the Princess Pier Head. Mr. P. Storey, electrical engineer, and Mr. H. A. Garrett, borough surveyor, produced and explained the plans of the proposed works.

Lieutenant-Colonel F. N. Innes has presented to the parish of Kincardine O'Neil a hall, which he has had erected at Torphins. The leading feature of the building is a massive square tower, at the base of which is the entrance to the hall, which is 80ft. by 30ft. The total cost of the gift is about £2,000.

On Friday the Wesleyans laid the foundation-stone of a new mission-hall for the extension of their work in Liscard, North-west Cheshire. The building is situated in Pear Tree-grove, Liscard-road, and is being erected at a cost of £1,300. The structure will be of one story, and measure 50ft. by 42ft. It will be designed in the Early English style, and faced with Ruabon bricks and Runcorn stone dressings. A plot of land adjoining has been secured for the prospective erection of a church. The architect of the mission-hall is Mr. T. W. Cubbon, Birkenhead, the contractors being Messrs. George Wood and Sons, Bootle.

OBITUARY.

Mr. Henry Townley Green, R.I., the well-known painter of 18th-century *genre* subjects, died on Monday, not having been able to recover from the shock of an operation which it was necessary to perform last week for a rapid growth in the throat. Mr. Townley Green, whose younger brother, the distinguished artist, Charles Green, died only eighteen months since—had early in his life joined the Royal Institute of Water Colour Painters, when as yet its quarters were in Pall Mall. Mr. Green, who was a bachelor and 63 years of age, had lived at Hampstead nearly the whole of his life.

CHIPS.

On Saturday the remains of Mr. John Knight, engineer to the Birmingham, Tame, and Rea district drainage board, who died at his residence, Glencree, Silver Birch-road, Erdington, on the previous Tuesday, were interred in the family grave at St. Mary's church, Moseley. The funeral was attended by the members of the drainage board, the city surveyor of Birmingham (Mr. Price), and the heads of the various branch departments.

Alderman Dobson, as chairman of the Corporation Lighting Committee, laid, on Friday, the foundation-stone of new electric-lighting works, which are being undertaken at Grimsby, at a cost of about £45,000. Professor A. W. B. Kennedy is the consulting engineer.

The West Riding asylums committee have been considering the question of housing idiot and imbecile children. They recommend that Stanley Hall be repaired and altered in accordance with plans prepared by Mr. Vickers Edwards, the Riding surveyor, at an estimated cost of £2,000, for the purpose of accommodating about 60 male idiots under 18 years of age.

The foundation-stone of the Chippenham technical and secondary schools was laid an Saturday last by Lady Dickson Poynder. The contract for the building, exclusive of fittings and cost of land, is £4,310, the contractors being Messrs. Smith and Light, of Chippenham, Wilts; and the architect Mr. Robert E. Brinkworth, F.S.I., who won it in competition.

The annual official report on Russian railways states that the Trans-Baikal Railway from Stretensk has been completed to the extent of 381 miles. In addition the rails have been laid from Misov to the river Selenga, which flows into the Baikal Lake from the south, a distance of 71 miles. The rails will be laid on the remaining 267 miles by the end of this year. At present the journey from St. Petersburg to Vladivostok in summer takes 27 days. The completion of the Trans-Baikal Railway will reduce this to 20 days.

At Whittleford, near Nuneaton, on Friday, foundation stones were laid of a Wesleyan school chapel in Church-road. The building will seat 180 persons in the main hall, and two classrooms and other offices are attached. The contract for building has been taken by Mr. G. Pike, of Bedworth, at £700.

Mr. William Roberts, of Edenwood, Whalley Range, and of Manchester, surveyor, who died on February 18 last, aged seventy-six years, leaving personal estate valued at £15,966 17s. 1d., bequeathed to public charities over £24,000.

Queen's-road Schools, Walthamstow, are being fitted with the Patent Tubular Exhaust Ventilators, manufactured by John King, Limited, engineers, Liverpool.

Mr. Kenneth H. James has offered to fill the vacant light next to the Chirgwin memorial, in the bay of the south side of the nave of Truro Cathedral, with stained glass, in memory of his father, a native of Truro, and has besides made a donation of £100 to the building fund.

The Duke of Westminster, on Thursday in last week, laid the foundation-stone of St. Deiniol's Library, Hawarden, which is to be one of the national memorials to the late Mr. Gladstone. It will consist of the library, a room 30ft. by 45ft., with a gallery around it; a Divinity room, 30ft. by 25ft.; a warden's room, and several studies. The library has been so designed that the valuable books may be transferred there exactly as they were arranged by Mr. Gladstone's own hand, in that original and ingenious way of his, by which the maximum number of volumes can be packed into the minimum amount of space. The style is Gothic, and the building will be faced with Helsby stone. £10,000 has been allocated by the London Committee for the library, of which Messrs. Douglas and Minshall, of Chester, are the architects, and Messrs. Parker, of the same city, the builders.

The name of Mr. James Vause, of Mahants, Halliwell, plumber and sanitary engineer, has been added to the commission of the peace for the borough of Bolton.

Building Intelligence.

Bournemouth.—The foundation-stone of St. Andrew's Church, Malmesbury Park, was laid with Masonic ceremony on Tuesday week. The nave of the church is planned with north and south aisles, each with its separate porch, which also communicates with the rest of the building. Central with the nave and its western end is a baptistery, flanked at its angles with buttresses, and covered with a rather steep pitched roof. The nave measures 80ft. by 25ft., and is separated from the aisles by four arches, which carry the clerestory, and the whole is spanned by open timber roof. The aisles are 11ft. wide, and broaden out at their eastern end to a width of 18ft. The style adopted is based upon English Gothic of the Decorated period. The walls are of Purbeck stone, with Bath stone dressings, and the roof is of red tiles. The total seating, exclusive of the clergy and choir, will be for 600 people. The architects are Messrs. Chatwin and Son, of Birmingham, and Sydney Tugwell, of Bournemouth. The builders are Messrs. Collins and Godfrey, of Tewkesbury, and their tender for the nave was £4,651. Towards this sum the the committee have received £2,661.

Blackpool.—The Freemasons of Blackpool have just entered in possession of the new premises they have erected in Upper Adelaide-street. The hall has a frontage of 98ft., faced in Yorkshire parpoints and ashlar dressings. On entering the main hall, a door on the left hand leads to a billiard-room, 33ft. by 32ft., and the bar. The other rooms on the ground-floor are a social and reading-room, 35ft. by 21ft., committee, card, store-rooms, and lavatory. The second floor is exclusively devoted to the mystic uses of the Craft. Its accommodation comprises a lodge-room, 48ft. by 28ft., large ante-rooms, storerooms, and dining-room, &c. The building also contains apartments for the caretaker and his family. The hall has been erected from the plans and under the supervision of Mr. J. A. Nuttall, architect, of Birley-street, Blackpool.

Cambridge.—The Rev. Dr. Watson has now succeeded in raising the whole sum required—viz., £10,000, in order that the English Presbyterian College at Cambridge may be opened free of cost on Tuesday next. The college stands at the junction of Queen's and Madingley-roads, and opposite the athletic grounds of St. John's and other colleges. The college, with the professors' houses and surrounding gardens, occupies about three acres of ground, inclosed by a red-brick wall with stone copings. Access to the ground is obtained by a fine pair of gates. They are of wrought-iron work, supported by stone pillars 19ft. high. The walls are of red brick, with Clipsham stone dressings, and the roof of grey Colleyweston slates. The style is English Renaissance. The building, as seen from the front, consists of a central block and two wings. The western angle of the central block is surmounted by a square tower, capped by a dome-shaped structure of oak, with glazed windows. This tower is unique so far as Cambridge is concerned. Mr. H. T. Hare is the architect of the college, which was illustrated by a detailed drawing in the Building News for Aug. 6, 1897.

Edinburgh.—Viewforth Free Church, Gilmore Place, was reopened after restoration on Sunday. Shortly after a fine new organ had been inaugurated in October last year a disastrous fire took place, burning out the whole interior of the church, and leaving nothing standing but the bare walls. Immediately a settlement had been arranged with the insurance company, steps were taken to restore the building, and opportunity has been taken to effect some considerable improvements. The pulpit and organ-case, which are elaborately carved and decorated with ornamental tracery, occupy nearly the whole of the north gable between the galleries. The organ has been built by Blackett and Howden, Ltd., Newcastle-on-Tyne, who also erected the instrument which was destroyed in the fire. The church is lighted with electric light. The cost of the work has been between £6,000 and £7,000, which was the amount received from the insurance company. The contractors were: For the mason work, the trustees of the late Peter Whyte; for the joiner work, &c., Messrs. H. T. and R. Montgomery, Merchiston Avenue; for the painting and decorations, Messrs. Wm. Forsyth and Son; and for the electric lighting and the organ motor, Messrs. Cameron and Hogg. The architect was Mr. T. P. Marwick, York-place, Edinburgh.

Kirkcaldy.—The Adam Smith and Beveridge Memorial Halls were opened on Wednesday. Originally promoted as a memento of the author of "The Wealth of Nations," subscriptions to the amount of between £2,000 and £3,000 had been raised, when it was announced that the late Mr. Beveridge, the provost of the borough, had bequeated £50,000 to the fund, and it was agreed that the large hall should be called the "Adam Smith Hall," and the lesser hall and the library the "Beveridge Library." The building, which is T-shaped in plan, is Late Renaissance in style, situated at the corner of Bennochy-road and St. Brycedale-avenue. On the ground floor, and in the centre of the façade facing Bennochy-road, is the main entrance-hall, which leads to a large crush-hall. On the left of the entrance and communicating with the crush-hall are the reference library and the lending library. The public entrance to the libraries is situate in the centre of the projecting wing to the right of the entrance to the halls. Situated on the right of the main entrance are the cloakrooms, lavatories, and refreshment-room. The main staircases, giving access to the gallery of the large hall, are situated to the right and left of the crush-hall. The large, or Adam Smith, hall is in the main body of the building. The hall measures 96ft. in length by 50ft. in breadth, and is seated for 1,500. The architects were Messrs. Dunn and Findlay, of Edinburgh.

Manchester.—The John Rylands Memorial Library, the munificent gift of the late Mr. Rylands's widow, was opened on Friday. Within its walls are housed the books which formed the famous Althorp Library, purchased from Earl Spencer at a cost of a quarter of a million, besides additions which have been collected during the last few years, making in all some 70,000 volumes. The main idea of the building, which was erected from designs by Mr. Basil Champneys, is that of a college library—that is to say, the library proper consists of a large central hall from which reading recesses open on either side. The site faces Deansgate, and is bounded on the north, east, and south-west by narrow streets containing buildings of considerable height. The style is Collegiate Tudor, the central entrance and recessed octagonal staircase turrets being treated with much richness, and the facing material is Penrith stone. The library itself is placed on the upper floor, and is set back some 10ft. from the building line. On the lower floor a cloister or corridor giving access to the ground-floor rooms occupies the remaining space, and is kept low. The whole of the Deansgate front is occupied by a vaulted vestibule, above which are the librarian's rooms. A short flight of wide steps leads up the centre of the vestibule, parting towards the left and right landing on the ground-floor level, and giving access to the cloistered corridors, whence all the first-floor rooms are reached. Facing this approach is an allegorical group representing Religion, Science, and Art, executed by Mr. John Cassidy. From the vestibule level stairs on either side lead down to lavatories in the basement, and from the landing on the ground-floor level a wide staircase leads to the first floor, giving immediate access to the librarian's rooms and to the main library. The ceiling of this staircase shows an octagonal lantern surrounded by a gallery. It is stone, vaulted throughout. The staircase, which occupies one of the towers, passes into a vestibule in the library proper, and the vaulted ceiling is some 52ft. from the first floor. The library consists of a central corridor about 20ft. wide and 125ft. long, ending in an apse at the further end, which gives an extreme length in all of about 148ft. It is 44ft. from the floor to the top of the vaulted ceiling, and is groined throughout in stone. It is divided into eight bays, one of which is occupied by the main entrance, while the rest open into reading recesses, giving on this floor 15 recesses occupied by bookcases. The end bay on either side projects, so as to form a transept for the building. The transept on the Wood-street side forms a recess of increased size. The style of the building is Gothic of the 14th century. The building is almost entirely vaulted in stone, but where this has not been admissible, fireproof construction is used after Messrs. Homan and Rodgers' system, the main floors being of a double thickness of fireproof with space between.——The foundation-stone of the new St. Mary's Hospital and Manchester and

Salford Lying-in Hospital and Dispensary for Women and Children was laid on Monday by the Countess of Derby. The new buildings are situated in Gloucester-street and Oxford-street. The Oxford-street frontage is considerably restricted, being only about 25ft. in width. The main front of the hospital is in Gloucester-street, along which it will extend a distance of 280ft. The plans have been prepared by Messrs. Alfred Waterhouse and Son, of London, and the works are being carried out by Mr. Vickers, of Nottingham. Accommodation is to be provided for 125 patients, the larger portion of the space being reserved for women, and further provision will be made in the buildings for the training of medical students, nurses, midwives, and monthly nurses.

Stalisfield, Kent.—The quaint little parish church has been restored at a cost of £560. Many interesting parts which were obscured by plaster and whitewash have been brought to light and preserved. On the walls some mural paintings were found; but, unfortunately, the colouring of the frescoes decayed so rapidly after being exposed to the light and air that it was found impossible to preserve them. Another notable find was that of the font, which was discovered imbedded in a mass of brickwork and plaster. The font, which is of stone, has been restored and placed in a prominent position near the entrance doors. The old entry to the rood loft, which was also hidden, has been opened out and left uncovered, while two steps in the staircase originally leading from the nave to the loft were found in the cavity between the nave wall and tower. These, too, together with the doorway from the nave into the staircase, have been preserved. A bricked-up doorway, which dates from the 14th century, was found in the south wall of the aisle. A blocked-up entrance into an old chantry chapel which was brought to light, together with traces of two chantry chapels, shows that the church was originally of much larger dimensions than the present building. The nave roof, which possesses some fine tie-beams, king-posts, and rafters of the 14th century, was hidden by a plaster ceiling; but the latter has been removed, and the roof exposed to view. Various other improvements have been effected, the seating has been rearranged, and a new pulpit provided. The chancel-screen, which dates from the 16th century, still remains in need of restoration, and it is also proposed to heighten the tower. The work already executed has been carried out by Messrs. Clarke, of Lenham, under the direction of the architect, Mr. H. Bensted, of Maidstone.

Truro.—At the meeting of the Cathedral Building Committee held on Saturday, the Bishop presiding, it was reported that nearly £30,000 had been promised, or was in hand, and that at least another £10,000 was required. Precentor Donaldson, hon. secretary, stated that progress was being made with the building of the nave from Mr. Frank L. Pearson's design. The tender of Messrs. Willcocks, of Wolverhampton, has been accepted, amounting to £31,680 for the first division of the work, including carrying the western towers up to the aisle level, and £3,238 for the second division, which would carry the towers and the west front to the level of the nave roof, altogether £34,918. There were certain other expenses, such as architect's commission, heating, lighting, &c., which would raise the total cost to about £38,000. Already the walls averaged 6ft. 6in. in height, and the piers 9ft. 6in. Still more rapid progress was about to be made. About eighty workmen were employed at present, and probably the number would be raised to 100 before long. Mr. Price, who was appointed clerk of the works by the committee, on the recommendation of Mr. Pearson, reported that great care was being taken to see that all the materials were of the best quality, and that the workmanship was excellent. Before long it was hoped that a recumbent brass bearing the effigy of the late Archbishop, nearly identical with the Canterbury monument, would be placed in the vestibule of the baptistery.

Wolverhampton.—The foundation-stone of the new building which is being erected in Old Hall-street, Wolverhampton, as a centre for the education of pupil teachers, was laid on Friday. The building is estimated to cost £10,000. It will consist of a two-story block, to provide accommodation for 240 pupil teachers. There will also be a block at the rear to accommodate 240 children, but that is not included in the present contract. On the ground floor, the boys' entrance will be on the west side, and the girls' on the east, opening into a common corridor 8ft. wide, which will be placed behind three classrooms, facing the street, two for 42 and one for 36 students. On the other side of the corridor will be placed the gymnasium hall, 52ft. by 32ft.; also the headmaster's private-room, &c. The first floor will be assistant teachers' rooms, and the arrangements on the first floor will correspond with those on the ground floor. In addition to the three classrooms, there will be placed an examination hall over the gymnasium, and a common room for the use of the students. Externally the building will be of a very simple character, the walls being faced with red bricks. The roofs will be covered with green slates. The building is being erected by Messrs. Willcock and Co., Wolverhampton, from drawings prepared by Mr. Thomas H. Fleming, of the same town, the architect to the School Board.

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CHIPS.

Peebles Parish Church Halls were opened on Thursday evening in last week. The halls are Gothic in style, with whinstone and red freestone facings. The main hall is 85ft. long and 45ft. wide, and is capable of accommodating 800 adults, or over 1,000 children. The cost of the building has been £2,500.

Mr. W. A. Ducat, Local Government Board inspector, held an inquiry at the town-hall, Royton, Lancs, on Friday, into an application made by the Urban District Council for permission to borrow £30,870 for the improvement of certain main roads, and for works of public and private street improvement and sewerage. For improvement of a portion of Oldham-road and Rochdale-road £13,040 was asked for, and for the improvement of a portion of Shaw-road £5,230, whilst for works of public and private street improvement the amount asked for was £12,000.

The West Ham board of guardians adopted at their last meeting a report by the works committee recommending that the erection of eight cottages and an administrative block at Forest House be intrusted to their working foreman, who had estimated the probable cost at £3,787 11s. 6d.

The foundation-stone of the technical and secondary school was laid in the Cocklebury-road, Chippenham, on Saturday. The plans were prepared by Mr. Robert Brinkworth, of Chippenham. It will accommodate from 150 to 170 day scholars, with separate entrances, and offices for boys and girls. The total estimated cost is £6,100.

The order by the Light Railway Commissioners for the construction of a light railway from Ayr to Girvan has now been approved and passed by the Board of Trade, and the work will soon be begun. The line, about 19 miles in length, passes Alloway on to Dunure, goes through the Culzean policies to Maidens, and on to Turnberry to Girvan Mains, where it joins the Glasgow and South-Western main line.

The Manchester City Council have sanctioned application being made to the Local Government Board to borrow nearly a million sterling for municipal purposes. The proposed loans include £60,000 for a new small-pox hospital, £25,000 for the purchase of a plot of land in a crowded part of the city, and £860,000 in connection with the municipalisation of the tramways.

The funeral took place at West Hartlepool, on Monday, of Mr. John Hogg, late builder and contractor, of West Hartlepool, who died at Richmond, Yorkshire, last week, at the age of 60 years. Deceased was an old standard of West Hartlepool, where he had resided for 35 years; but about 18 months ago he retired from business, and went to live at Richmond. Deceased was a prominent builder in West Hartlepool, and from 1875 to 1878 he was a town commissioner. He was a native of Leyburn.

A meeting of the Bristol City Council was held, on Tuesday, when the Portishead Dock scheme—estimated cost of works £350,000—was affirmed by a majority of 40 votes to 27.

The R.C. abbey church and nuns' choir of St. Scholastica's Abbey, Teignmouth, have been recently restored and redecorated, and were solemnly reopened the Sunday before last. The Early Gothic church, originally designed by Mr. Goldie, has been enlarged and decorated. A new cloistral wing has been added, leading from the right side of the sanctuary to the inclosure door of the choir. All the ornamentation has been repainted, but the artistic designs have been strictly adhered to. The paintings have been carried out by the firm of Messrs. Murrin and Co., of Newton Abbot. The decorations were intrusted to Mr. Coe.

Engineering Notes.

Bristol and South Wales Direct Railway.—This undertaking of the Great Western Railway Company is being rapidly proceeded with, but from the nature of the undertaking a considerable time must elapse before the line is ready for traffic. Its object is to shorten and improve the route between Bristol and South Wales and London, and this it does by avoiding the great curve to the south made by the present main route through Bath and Chippenham. The new line starts from the South Wales Railway between Patchway and Filton, and, taking a course nearly due east, joins the present main line at Wootton Basset. The length of line will be 33½ miles, and compared with the route viâ Bristol and Bath, it will save 11 miles in the journey from Newport to London, while compared with the route viâ Gloucester it is 26 miles shorter. The saving from Bristol is not considerable in distance, but the new route will avoid the heavy gradients on the existing line at Box and at Wootton Basset. The undertaking will also have an important bearing on another new Great Western line—viz., that from Pilning to Avonmouth Dock, which is now nearly complete. The Bristol and South Wales Direct Railway involves the construction of three tunnels (one beneath the Cotswold Hills being 2½ miles in length), four large viaducts, and in addition no fewer than a hundred bridges. There will be seven new stations—viz., Winterbourne, Coalpit Heath, Chipping Sodbury, Badminton, Hullavington, Somerford, and Brinkworth.

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Memorial-stones of new board schools in Victoria-road, Morley, were laid on Saturday. The new buildings will provide accommodation for 500 boys and girls and 240 infants. The estimated cost of the building, exclusive of the site, is £9,500.

The partnership hitherto subsisting between J. Murray and F. Foster, architects and surveyors, Adelphi-terrace, John-street, Adelphi, W.C., under the style of Murray and Foster, has been dissolved, as has also the partnership heretofore existing between H. F. Phillips, J. Norfolk, and S. F. Prior, of Catford Bridge, architects, so far as regards H. F. Phillips.

Mr. Charles Perrin, of the Local Government Board, has held an inquiry at Holt, Norfolk, into the application of the Erpingham Rural District Council to borrow £2,500 for providing an auxiliary water supply for Holt. There was no opposition.

The Falmouth Corporation have resolved to approach the local water company with a view to purchasing the latter's property.

The rural district council of Hursley having applied for permission to borrow £600 to build the Quorn Bridge at Brambridge, a Local Government inquiry was held at the village club on Friday by Colonel C. H. Luard, R.E. Messrs. Lemon and Blizard, of Southampton, the engineers, explained the plans for the bridge, which will consist of iron girders resting on wooden piles.

The tramway committee of the Aberdeen Corporation have issued a report dealing with the proposed extensions of the system, for which Parliamentary powers are to be sought in the ensuing session. It is suggested that lines be laid to Ferryhill, to the bathing station, and to Torry. To accomplish this, and also to adapt the present track to the overhead electric method of haulage, the expenditure is estimated at £280,000. It is proposed, in conjunction with these works, to lay Union-street with wood-paving.

The foundation-stone of the Dudley municipal electric lighting and power station, which is in course of erection at Springsmire, was laid on Monday by the mayor. The new structure will be a plain brick building, and to the present plant will be added four more Westinghouse engines, dynamos, and boilers, with an enlarged indicating apparatus. Contracts for the permanent work and plant, amounting to £21,472, have been passed by the council. Mr. R. P. Wilson is the counselling electrical engineer, and Messrs. J. H. Whittaker and Co. are the builders.

Auchmithie Harbour, which suffered much damage from the storm in October of last year, is being reconstructed and improved. The rocks at the entrance have been blasted and removed, and the harbour is being deepened. The portion of the quay which was destroyed has also been reconstructed, and its height increased by 9ft., while the foundations have been strengthened. The northern wall has also been rebuilt. The contractor is Mr. James Simpson, Dunblane, and the operations are being carried out under the direction of Mr. Buchanan, Dundee.

COMPETITIONS.

Midlothian County Buildings, Edinburgh.—At a meeting of the county council of Midlothian, held at Edinburgh on Wednesday, the chairman, Sir J. Gibson-Craig, moved the approval of a report by a sub-committee on the proposed new County Council Buildings, which, he said, had now been practically unanimously agreed to by the committee. There had been differences at first, but these had been settled. The first thing the committee had had to consider was proper accommodation for themselves, their committees, and their officials. They were not pulling down their present building because it was ugly, but because it would not hold them. Their next duty was towards their neighbours, and they had to take care that their fronts to the east, west, and north were suitable. With regard to the annexation at the south, though they might not require it, some future county council might be able to avail themselves of it. They had also to take care not to injure their neighbours, and they had taken into consideration the Signet Library in the matter. The chairman explained how they had not agreed to accept the plans suggested by the assessor, Mr. W. Wybrow Robertson, and pointed out that the plan of Mr. McIntyre Henry, which had been accepted, was *appreciably cheaper than any of the others.* It would probably cost about £35,000. The report was adopted, and Mr. J. McIntyre Henry, of South Charlotte-street, Edinburgh, was appointed architect for the buildings, the first premium of £100 being awarded to Messrs. Scott and Campell, and the second, of £50, to Mr. H. J. Blanc, R.S.A. Twenty designs were received. We understand that the assessor placed the designs in order of merit as follows:—1st, that submitted by Messrs. Scott and Campbell, under the distinguishing motto "A Moi"; 2nd, "Pax," sent in by Mr. Hippolyte J. Blanc; and 3rd, "Midlothian," jointly prepared by Messrs. McArthur and Watson and Mr. George Watson; 4th, "Rab," Mr. J. MacIntyre Henry; and, 5th, "Law and Order," Messrs. Paterson and Horsburgh, all of Edinburgh. The committee of the County Council were, we are informed, of opinion that the assessor based the above awards purely on the architectural merits of the several designs submitted in competition, without taking sufficiently into consideration the practical requirements of the Council. They therefore forwarded the design "Rab" (that of Mr. Henry) to Messrs. Honeyman and Keppie, architects, of Glasgow, who reported favourably upon it, but their firm had not the opportunity of inspecting the other designs. In an early edition on Wednesday of the *Edinburgh Evening News*, it was stated that while the sub-committee recommended the adoption of Mr. Henry's design, the first premium was to be awarded to Mr. R. M. Cameron, of Edinburgh (who was employed to prepare sketches prior to a competition being arranged); but in later editions all mention of Mr. Cameron was omitted. The selected design is promised us, which we hope to reproduce.

PROFESSIONAL AND TRADE SOCIETIES.

Glasgow Architectural Association.—On the 3rd inst., in the Rooms, 187, Pitt-street, the president (Mr. John Fairweather, A.R.I.B A.) in the chair, Mr. W. J. Blain read a paper entitled the "Influence of Fashion on Architectural Taste." Reviewing the various styles from the Classic period onward, he pointed out that previous to the end of last century we found in the styles or fashion of architecture a continuous growth and tenacious purpose, extending over long periods and brought to decay by political changes and revolutions of thought, but that with the birth of the present century we observed but diminutive growths, lasting but for short periods: the reason for this, in the author's opinion, being the decentralisation of culture, the spread of literature, and the study of modern languages and people, &c. The author pointed out that these diminutive growths which had generally taken the form of revivals of various styles, as, for instance, the Classic Revival, early Gothic Revival, the Dutch and Spanish Revivals, and the modern Georgian, had not been without some lasting benefit to architecture; books having been written, buildings having been sketched, measured, and catalogued, and a vast storehouse of information accumulated of the various styles;—the very mistakes of the Revivalists having caused us deeper searching and insight into the spirit of old work, so that at last we possess the key to the ideal charm of these buildings, thus paving the way to a development of style on a broad basis. In conclusion, the author remarked that he had no sympathy with an art which recognised no tradition or style, and that a building without style appeared to him about as uninteresting as a man without character.

Sanitary Inspectors' Association.—The sixteenth annual meeting of the members of this association was held on Saturday at Carpenters' Hall, London-wall, Mr. T. J. Moss Flower, C.E., in the chair. The report of the council showed that 68 new members had joined the association during the past year; three had been lost through death, four associates had been elected during the past year, and one had been transferred from the associateship to full membership. The London County Council had been approached with a view to obtaining certain modifications in the new Public Health Bill for London which the Council proposed to present to the next Session of Parliament. The association now had a membership of upwards of 700, and comprised nearly the whole of the Metropolitan sanitary inspectors. They were of opinion that they should be put on the same level as medical officers of health so far as the tenure of their office was concerned. Medical officers could not be dismissed from their appointments without the consent of the Local Government Board, while sanitary inspectors could be removed by the local authorities alone. That injustice to their members should be removed, in order that they might the more efficiently and independently discharge their important duties. A Bill was to be presented next year to Parliament to remedy the unfairness. An examination board for sanitary inspectors had been inaugurated by the Board of Trade, and the first examination would be held in December next. The council had made every possible effort to secure representation on the board, but without success. Seeing that nearly all other associations and institutions claiming to be directly or indirectly connected with the teaching of sanitation were represented on the new board, the council considered that they had most justifiable grounds for complaint, and could only hope that the injustice under which they laboured would be removed. They were anxious to bring about a system by which the members could secure superannuation from the various local authorities employing them, aided by contributions from the members themselves, on the same principle as prevailed among Poor Law officers. A benevolent fund had been started, and all that was required to make it a success was the hearty co-operation of the members. The unification of all sanitary inspectors' associations had been discussed, and a working-plan suggested, which, if it could be adopted, would result in much lasting good being done in the interests of all the associations concerned. The report was adopted, and Mr. W. H. Grigg was appointed chairman of the council for the ensuing year.

Old Greyfriars' Church, Edinburgh, was reopened on Sunday after internal decoration in colour, carried out by Messrs. Thomas Bonnar and Sons, of Edinburgh. Mr. C. J. Brown carried out the structural works.

A new Central Primitive Methodist Church in Northumberland-road, Newcastle, was formally opened on Friday. The new church is to take the place of the old Primitive Methodist Chapel in Nelson-street, which, erected some sixty years ago, was abandoned the previous Sunday, and has been purchased for business purposes by a local plumber. It has been erected at a cost of over £12,000, and provides sitting accommodation for 800 people.

On Wednesday week, Colonel C. H. Luard, R.E., held an inquiry at Tunbridge Wells on behalf of the Local Government Board, into an application of the town council to borrow £4,500 for the purpose of public baths. The town clerk explained that sanction for £7,200 had already been obtained. The original estimate was £5,800. The lowest tender, however, was £7,985, and £11,377 had been spent.

The town council of Walsall, on Monday, accepted the resignation of his office as gasworks manager, after thirty years' service, by Mr. J. Tindall, and appointed him as consulting engineer, at a salary of £200 a year.

The Ilford District Council have adopted a proposal to acquire land for a new park at Barkingside. A letter was read from Mr. Cameron Corbett, M.P., offering to give the council eight acres of ground for a recreation-ground at Chadwell. The offer was thankfully accepted, and it was pointed out that Ilford will now possess four parks.

WATER SUPPLY AND SANITARY MATTERS.

Aberdeen Water Supply.—The report by Mr. William Dyack, borough surveyor, and Mr. G. G. Jenkins, C.E., on the best mode of obtaining a supply of water for the city of Aberdeen from the river Don, in Banffshire, has been issued to the town council. The reporters describe three different routes of aqueduct. The longest is 49½ miles, the next 48 miles, and the third 47¾ miles. The proposed starting-place in each case is a point above the Lion Burn, the water there ranking, in the opinion of Mr. Thomas Jamieson, public analyst for the city, who has chemically examined it, as in respect of purity the first in the kingdom. The gathering area in the Glen Avon deer forest, the property of the Duke of Richmond and Gordon, is about twelve miles long, on an average three miles broad, and extends to 22,540 acres, and is exceptionally free from matter which would discolour the water. The inhabitants, the reporters think, would be fortunate in obtaining such a pure supply. Turning their attention to the question of quantity, they have considered the present as well as the future requirements of the city, and they have, for an estimated population fifty years hence of 300,000, allowed a supply of not less than twenty million gallons daily. They are of opinion, however, that it would be sufficient to meet the present and future requirements for some time to come to provide a supply of ten million gallons in the mean time, and on that footing the estimates are based. Scheme No. 1 would cost £857,900; No. 2 scheme £950,000; and No. 3 £1,019,000. Route No. 3, the reporters consider, would be the best line, between Banchory and Aberdeen. In the estimates allowance is made for compensation works.

CHIPS.

A new Congregational church at Bow, Devon, was opened on Friday. It seats 170 persons, has cost £600, and has been built in Beer stone, from plans by Mr. W. Carter Pedler, the donor of the site.

The Rev. J. C. Cox, LL.D., in an article in this month's *Antiquary*, describes in terms of high commendation the work of repairs and rebuilding carried out to the fine 13th-century tower of Clare Church, West Suffolk, under the direction of Mr. Detmar J. Blow. The tower, some 80ft. in height, had shown signs of subsidence, but has been rendered vertical, and the mortar joints have been replaced with cement, at a total outlay of £1,300.

The business done at the Mart last week presented few features of interest. Investments in weekly tenancies at the East End sold as well as ever, and property of a kindred character elsewhere changed hands freely; but higher-priced securities fell flat, and withdrawals therein were consequently inevitable. The returns of £43,305, although exceeding those of the corresponding week of last year, were less than half the sum registered last week.

The sanction of the Local Government Board has been received to the borrowing by the city council of Liverpool of £10,000 for the purposes of the Liverpool Sanitary Amendment Act, 1864, and section 79 of the Liverpool Improvement Act, 1882; and at the last meeting of that council £10,000 was placed at the disposal of the insanitary property and artisans' dwellings committee for the purchase of insanitary property, pursuant to the provisions of the Acts mentioned.

Plans have been submitted to the London County Council this week for a new playhouse to be built off the Tottenham Court-road, on the site of the old Prince of Wales Theatre. The auditorium is to hold twelve hundred people. Mr. Greatbach is to be the architect.

The temporary bridge over the Thames at Kew, which is to serve during the construction of the new Kew Bridge, will be opened for traffic on Monday next. The new permanent bridge will be built of Aberdeen and Cornwall granite, from designs prepared by Sir J. Wolfe Barry.

The contract for the erection of the bridge across Breydon Water, near Southtown, to carry the new M. and G.N.R. joint line to Lowestoft, has been obtained by Messrs. Lovatt and Co., of Wolverhampton. Three pile-drivers have already been erected on the north side of Breydon, and a commencement of this work seems likely now to be taken in hand.

At Knowle parish church structural alterations are in progress. The chancel is being rearranged, and the organ and choir will be removed into the chancel, and the north chapel, with its traceried windows, opened out to the church. The plans for the new clergy and choir vestries and organ chamber have been prepared by Mr. J. A. Chatwin, of Birmingham, and the contractors are Messrs. Collins and Godfrey, of Tewkesbury, the cost of the work being estimated at £850.

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ILLUSTRATIONS.

FRIEZE FROM THE PRINCE'S RESTAURANT.—NEW HIGHER GRADE SCHOOL, ASTON.—IRONWORK FROM BEVERLEY MINSTER.—RESIDENCE AT BRUNDALL, NEAR NORWICH.—UNITED METHODIST FREE CHURCH, BACUP.—ST. BENET'S MINSTER, BECCLES.—THE OLD CHEQUERS INN, TONBRIDGE.—YEW TREE FARM, CHEETHAM HILL.—WHITE LION YARD, LONG MILLGATE.

Our Illustrations.

FRIEZE IN THE PRINCE'S RESTAURANT.

The frieze in the reception-room of the Prince's Restaurant represents the meeting of Henry VIII. and Francis I. It is divided into panels by constructional pilasters on which are painted arabesques. It is about 120ft. long by 5ft. 6in. high, and is painted in Gambier Parry's medium on a groundwork of gold raised in gesso. The scene depicted was carried out from the description of this meeting from the State papers of the reign of Henry VIII. compiled for the Government by the Rev. J. S. Brewer, M.A. The illustrated sketch was the first suggestion, and was much modified and altered in the executed frieze. This frieze is one of three painted in the new portion of the Prince's Restaurant, Piccadilly, by Mr. H. C. Brewer. The conversion of the building and rooms were carried out from the designs of Messrs. Wimperis and Arber, architects, of Sackville-street.

NEW HIGHER GRADE SCHOOLS, ASTON, NEAR BIRMINGHAM.

This school, which we illustrate from the Royal Academy drawing, is being built for the Aston School Board on a site situate at the corner of Whitehead-road, Ettington-road, and Prestbury-road, and consists, in addition to the accommodation for 560 higher-grade school scholars, of a pupil teachers' centre for 120, and a deaf school for male and female pupils. The general arrangements consist of a school for 280 senior boys and 280 senior girls in separate departments, with two teachers' rooms to each department. The assembly hall is only used for opening and closing and drill, all the scholars being taught in separate classrooms, with varying accommodation of from 40 to 60 each. This general department of the school is placed on the two upper floors. There is a deep fall at the back of the land, which has made it possible to plan a science department on the ground floor as approached from the playground, while the main block as approached from the front is practically at the street level. The special department consists of a chemical laboratory for 50 scholars, and a physical laboratory for the same number. A properly-equipped gymnasium is approached directly from the playground. The pupil teachers' centre, deaf school, and caretaker's house forms a block by itself. The building is of a very substantial character of Leicestershire sand bricks with buff terracotta dressings. The central hall, which is carried up two stories, is made the main feature of the design, being flanked on either side by entrances, staircases, and classrooms. This main block is flanked by the pupil teachers' centre and deaf school, by which a partial quadrangular effect is obtained. The cost of the building, exclusive of fittings and furniture, is £20,000. The architects are Messrs. Crouch and Butler, Newhall-street, Birmingham, whose designs were placed first in competition by the assessor, Mr. E. R. Robson, F.S.A. The contractor is Mr. John Bowen, of Balsall Heath. The terracotta is made by Messrs. Doulton and Co., of Lambeth. The mosaic is made by Messrs. Diespeker and Co., Holborn-viaduct, London.

IRON GATES IN THE CHOIR, BEVERLEY MINSTER.

This sheet of details forms part of the series of drawings with which Mr. Hervey Rutherford won the Pugin Travelling Studentship. The subject, here so thoroughly well delineated, needs but little description, and although the style illustrated may be familiar enough, so careful a study of so capital an example of real forged work can but be welcomed by those who value good design and honest workmanship. These gates need no recommendation, and in these days of tawdry metal-work their graceful lines and well-proportioned parts afford a lesson which some of those who spoil their productions by straining after mere novelty of effect will do well to emulate. To surpass the excellence of such designs as this is by no means likely; they serve as a standard for reference, though not exactly for literal imitation. We ought to have got beyond mere archæology in design.

HOUSE AT BRUNDALL.

The house was designed for Mr. Eddington, who has erected it on a rather exposed site, but having fine views over the Yare valley. Mr. J. Young, of Norwich, was the builder, and the architects were Messrs. George J. and F. W. Skipper, also of Norwich.

UNITED METHODIST FREE CHURCH, BACUP.

Waterside Chapel, Bacup, which is picturesquely situated on the slope of a hill, has been recently erected for the Trustees of the Methodist Free Church. The new building adjoins their old premises, which are to be utilised in future for school purposes. The new chapel, with an end gallery, accommodates 475 worshippers. A cloak-room, two vestries, and a recessed choir and organ-chamber are provided. The exterior of the new building is faced with Yorkshire stone. The floors are laid with tiles and wood blocks. The internal seats and fittings are of selected pitch-pine, whilst the rostrum is of oak, all designed in keeping with the exterior. The work has been carried out by Messrs. Hargreaves and Nuttall, local contractors, under the supervision of Mr. Geo. E. Bolshaw, architect, of Southport.

ST. BENET'S MINSTER, BECCLES, SUFFOLK.

This Roman Catholic church, now in course of building, will not be orientated, the present position of the buildings rendering this impossible. Consequently it will lie nearly north and south, the chancel being to the south. The material employed for the interior will be Bath stone, and for the outside Ancaster stone with Bath stone dressings. The Minster will consist of nave and aisles with west porch, a baptistery to the east, central tower and transepts, chancel and Lady-chapel beyond. The aisles will be continued round the chancel. Above the arches of the nave will be the triforium and clerestory. The confessionals will be at the south end of the west aisle, and the organ will be placed in the west transept. West of the choir aisle will be the sacristy, in which is an altar. The main entrance will be on the north from St. Mary-road, being 12ft. 6in. above the crown of that road, and will be approached by steps and terraces. The north porch is formed from the thickness of the wall, and will have a depth of 8ft. 6in. The extreme interior length from the Lady-chapel to north porch at the end of the nave will be 182ft. The dimensions of the nave will be 84ft. in length, consisting of seven bays, with a height of 40ft. and width of 21ft. The aisles, which are designed merely for processional purposes, will be 84ft. long by 7ft. wide, and 16ft. in height. The tower will be 25ft. square externally, and will rise to a height of 81ft. above St. Mary's-road. The floor of the chancel will be 3ft. above that of the nave, and there will be another rise of 3ft. to the Lady-chapel. Thus the floor of the Lady-chapel will be 18ft. 6in. above the road level. A doorway from the east aisle communicates at once with the Catholic cemetery. The roof will be a timber one, ceiled at the collar, with principals and collar 12in. by 9in., the rafters 6in. by 4in., showing below the boarding of the roof. Between the arches of the nave are massive shafts which rise to the spring of the clerestory windows, where they end in a cap. Here the principals of the roof begin, and to them are mortised ribs, which are carried over the nave, forming circular arches to each principal. The nave will not be benched, and the floor will probably be of stone slabs or Venetian mosaic, and the roof and vacant places on the walls will be eventually richly coloured. The style of architecture is that of the Norman period, shown in the massive piers of the nave 4ft. 6in. across, and the outer walls 2ft. 6in. At present the contract is for that portion of the minster which extends from the north entrance up to and including the first arch of the tower. The architect is Mr. F. E. Banham, of Beccles. The present temporary church at St. Benet's will be altered so as to form a portion of the north cloister, and the Guildhall for social and parochial purposes. The plan of nave and aisles is modelled after the beautiful Norman church of Blyth on the borders of Yorkshire. The north façade is intended to recall ideas of Kirkstall and Lindisfarne; while the transepts and south end are suggested by Romsey. Iffley, in Oxfordshire, has been brought into contribution in the tower, and Benedictine Glastonbury gives its support to the fabric in the buttresses of the Lady-chapel and baptistery.

YE OLDE CHEQUERS INN, TONBRIDGE.

This quaintly-gabled building in the old timber style is probably some 500 years old, and at one time was the only inn in the town. It was famous as a stopping station for the stage-coach, Tonbridge being on the direct road from London to the Continent. An old engraving, depicting Tonbridge in the "good old days," shows us hard by "the Olde Chequers" two institutions, both indicative of those genial times—namely, the whipping-post and town stocks. The house ranks among the possessions of the historic Colepepper family. C. Henzell Ascroft.

TWO ANCIENT MANCHESTER HOUSES.

These sketches sent us by Mr. H. Cheetham, of Manchester, are selected from a series of drawings made by him in illustration of existing remains in that great city. The Seven Stars tavern is said to be the oldest licensed house in the country, its first license dating from 1356 in the reign of Edward III. The White Lion, another old hostelry with a quaint back yard, of which a view is given, is situated in Long Millgate. Its front is plastered and painted so that its old character has gone; but the buildings round the yard display the old timber construction which gives such interest to the group. Among the landlords of this "public" rank the local celebrity Jim Holden, famous as a stakeholder in foot-racing, jumping, and wrestling. Yew Tree Farm at Cheetham Hill is one of those picturesque old places without any special historical record, or at least we have no particulars concerning it.

CHIPS.

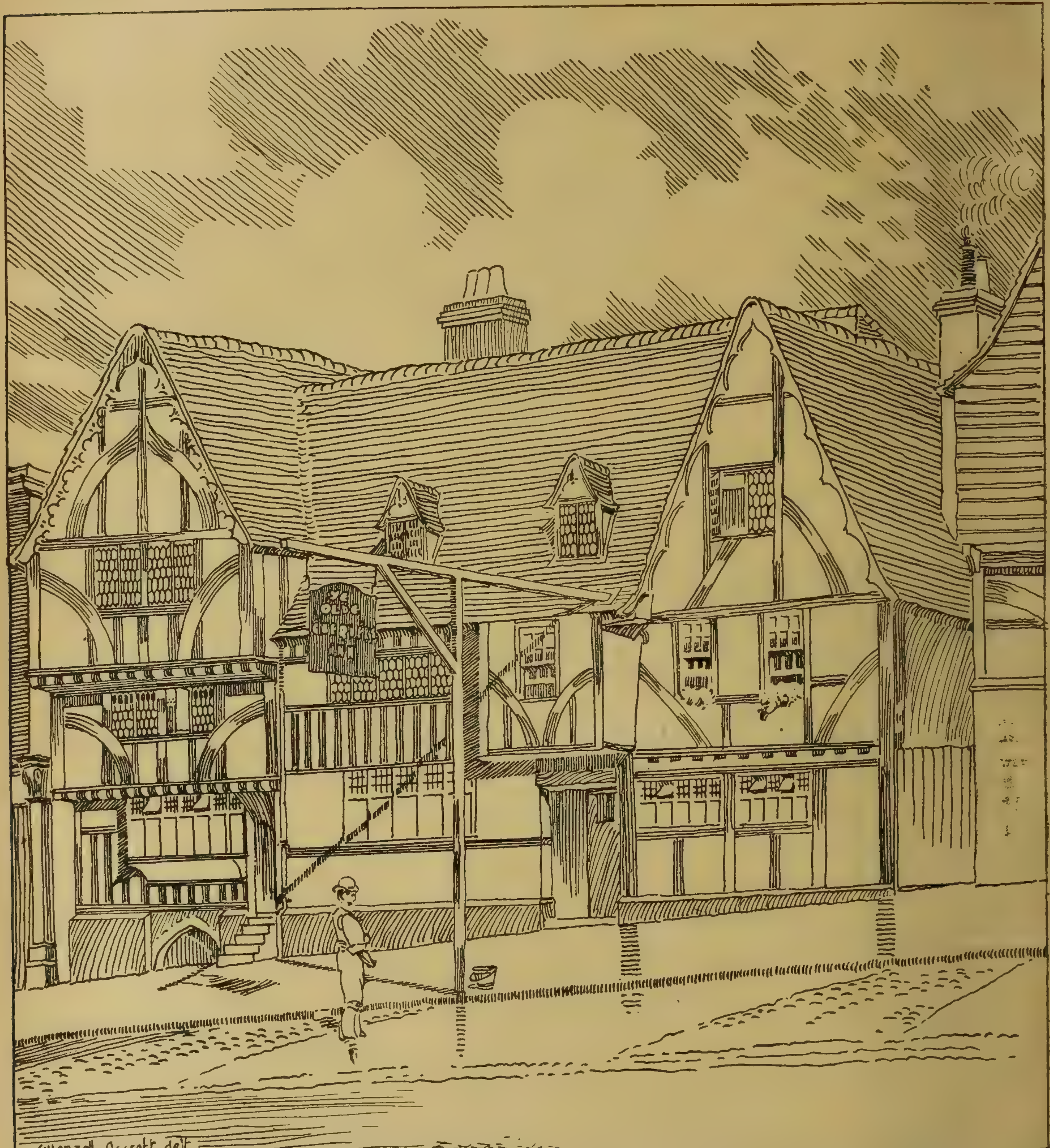
A telegram from Cairo on Monday announces that at the Temple of Karnak, on the eastern bank of the Nile, nine of the columns of the great hall there have fallen down.

The statue of Mr. Gladstone which is to be presented to Manchester in accordance with the terms of the bequest of the late Alderman Roberts has reached another stage. The plaster cast has now been modelled from the clay model. Signor Mario Raggi is the artist.

The Bishop of Winchester, on Saturday afternoon, consecrated St. Saviour's Church, Guildford, which has been built to accommodate 450 worshippers. The building has cost about £5,500.

In Dunning parish church, N.B., two memorial windows were dedicated on Sunday. One of the windows contains a figure of Our Lord as "The Good Shepherd," and the other a figure of Our Lord as "The Sower of the Good Seed." The work is from the studios of Messrs. A. Ballantine and Gardiner, Edinburgh.

At Monday's meeting of the Morecambe Urban District Council the surveyor was instructed to prepare draft plans for the widening of Marine-road and the Promenade west of the Midland Hotel. With reference to the sewerage scheme, an agreement was entered into appointing Messrs. Beesley, Son, and Nichols, engineers for the carrying out of the work, and an advertisement inviting tenders was approved. The Local Government Board wrote sanctioning a loan of £5,000 for the erection of a Beaman and Deas' refuse destructor, at the council's electricity works.



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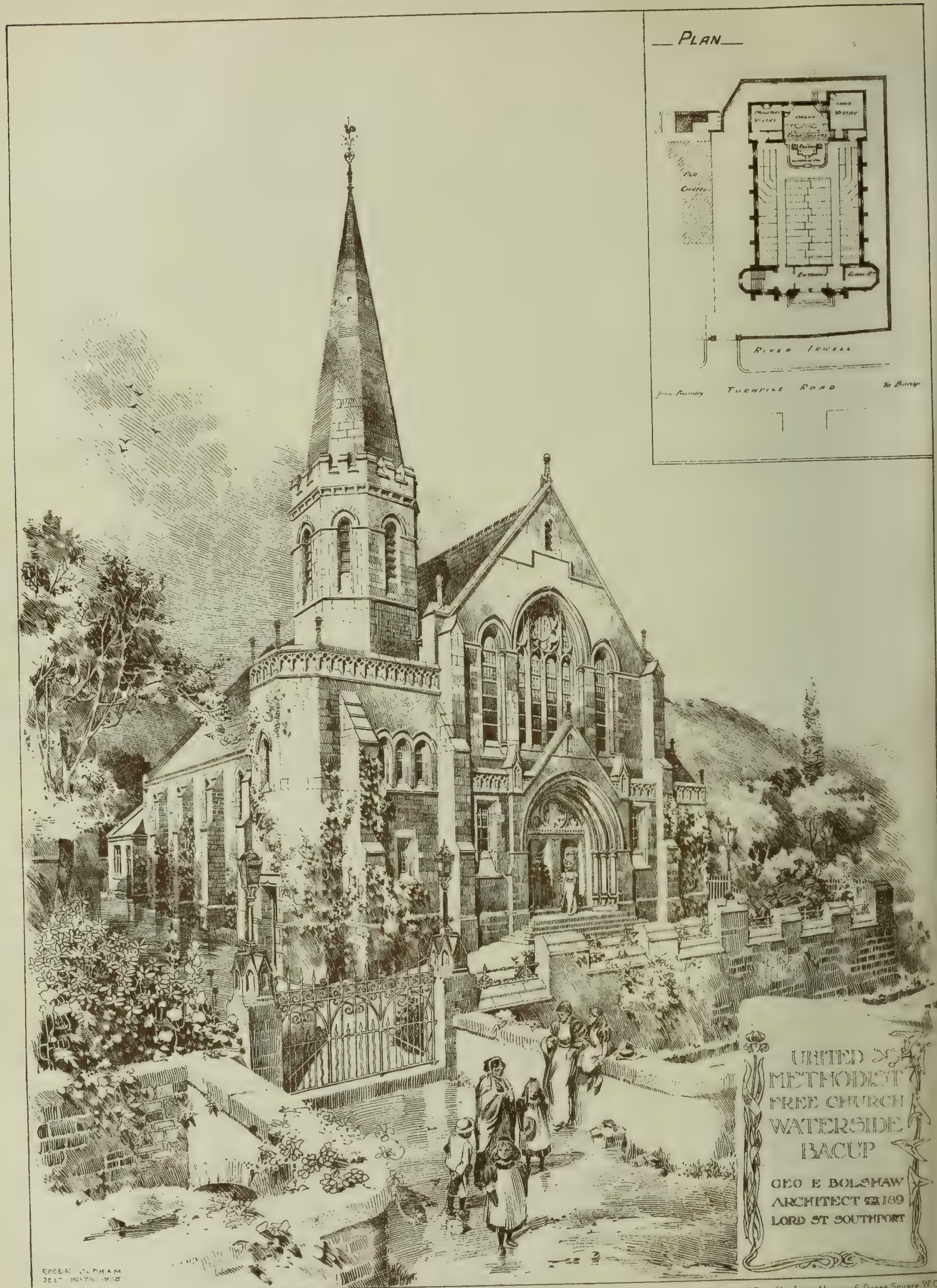
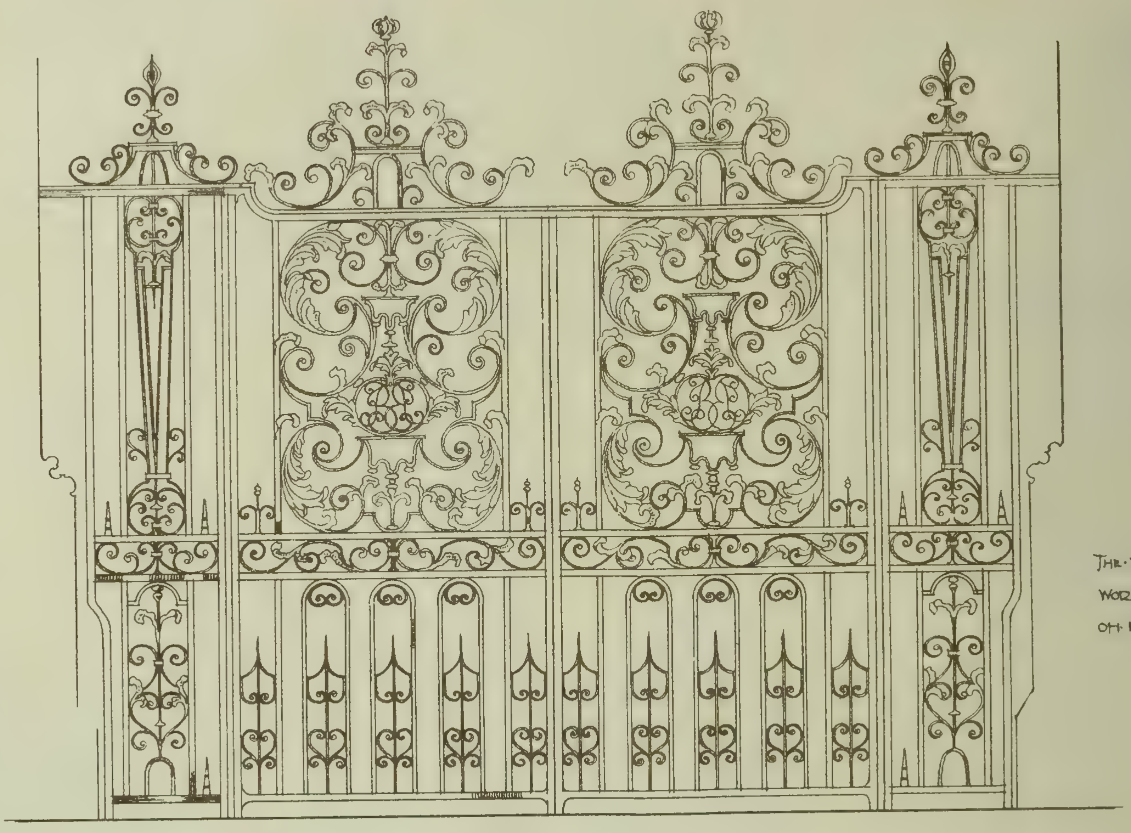


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

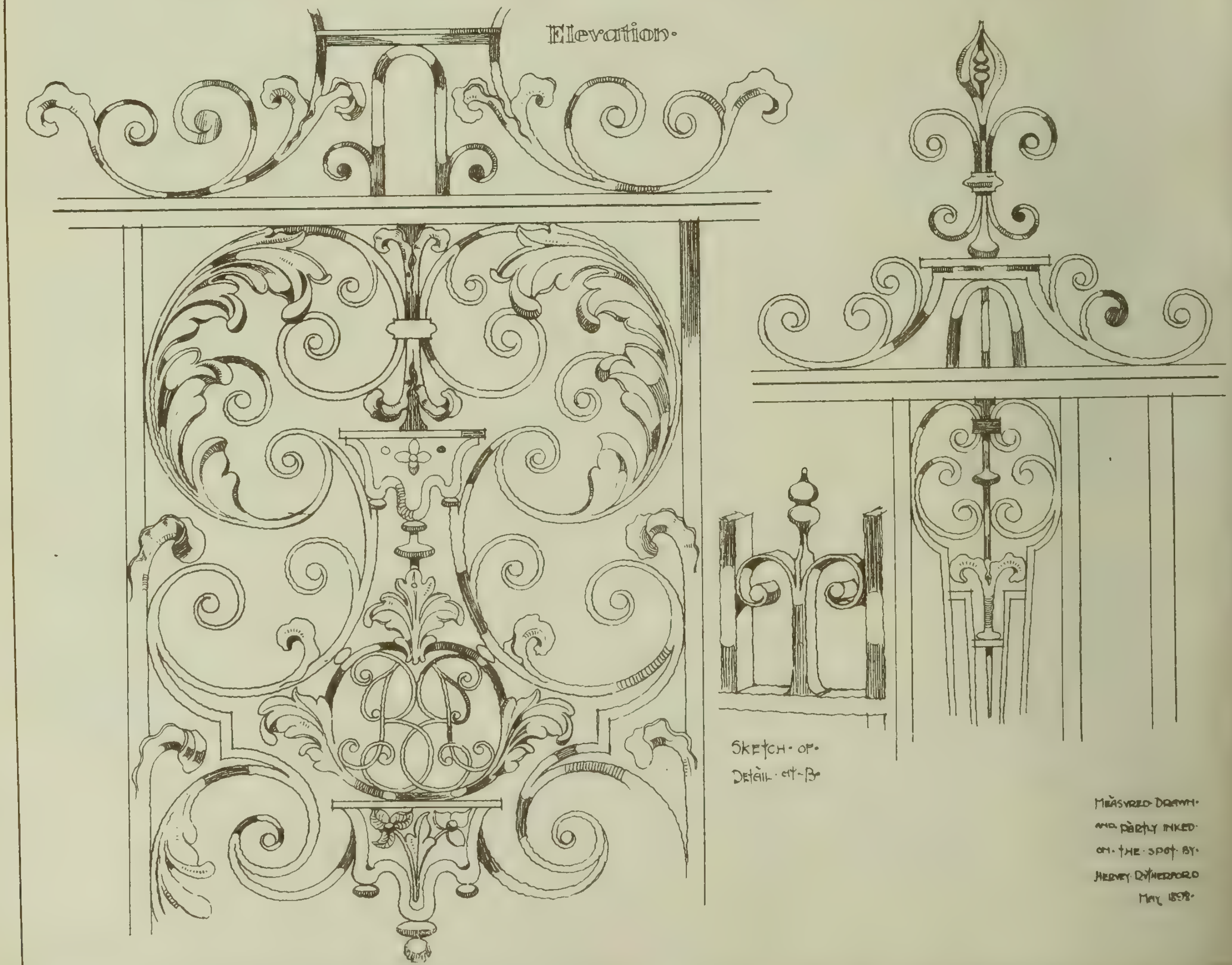
BEVERLEY·MINSTER

Iron·Gates·in·Choir·



THE·WROUGHT LEAF·· WORK· IS· THE SAME· ON· BOTH·SIDES·

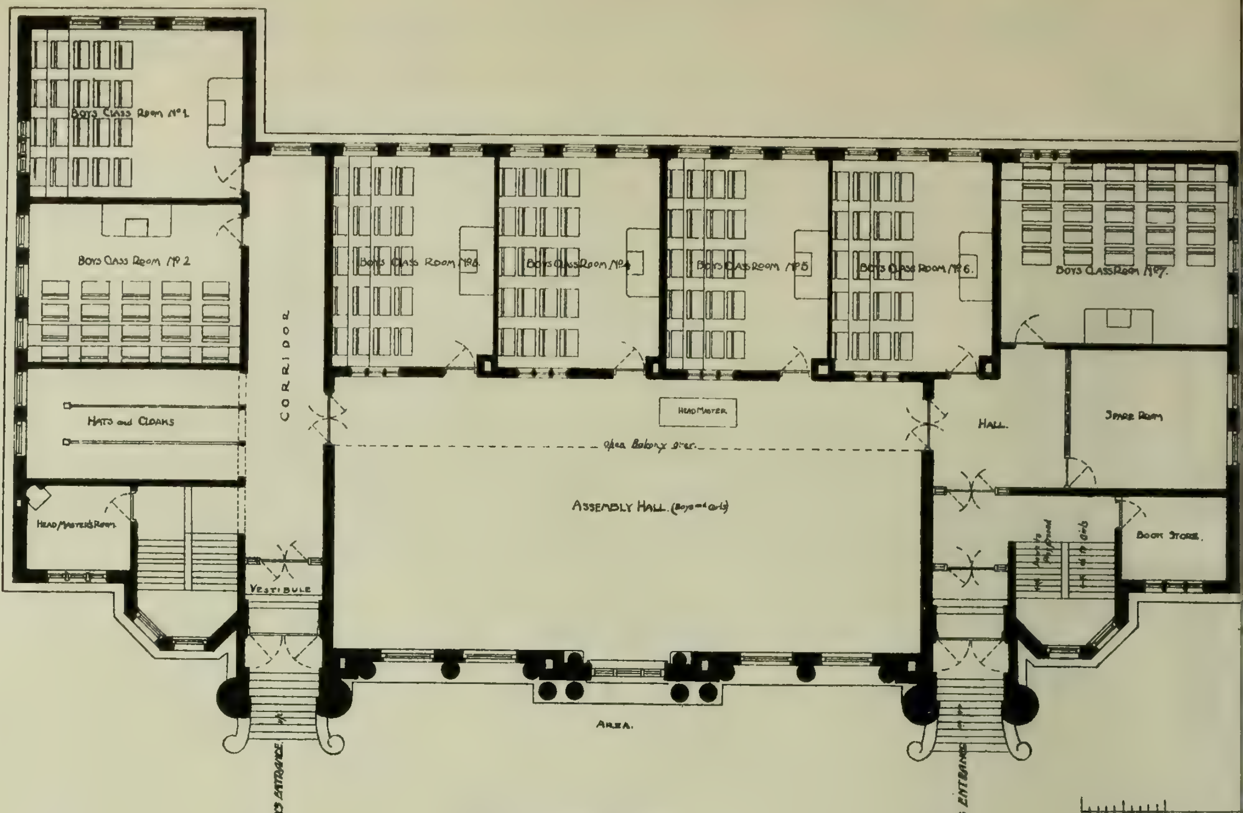
Elevation·



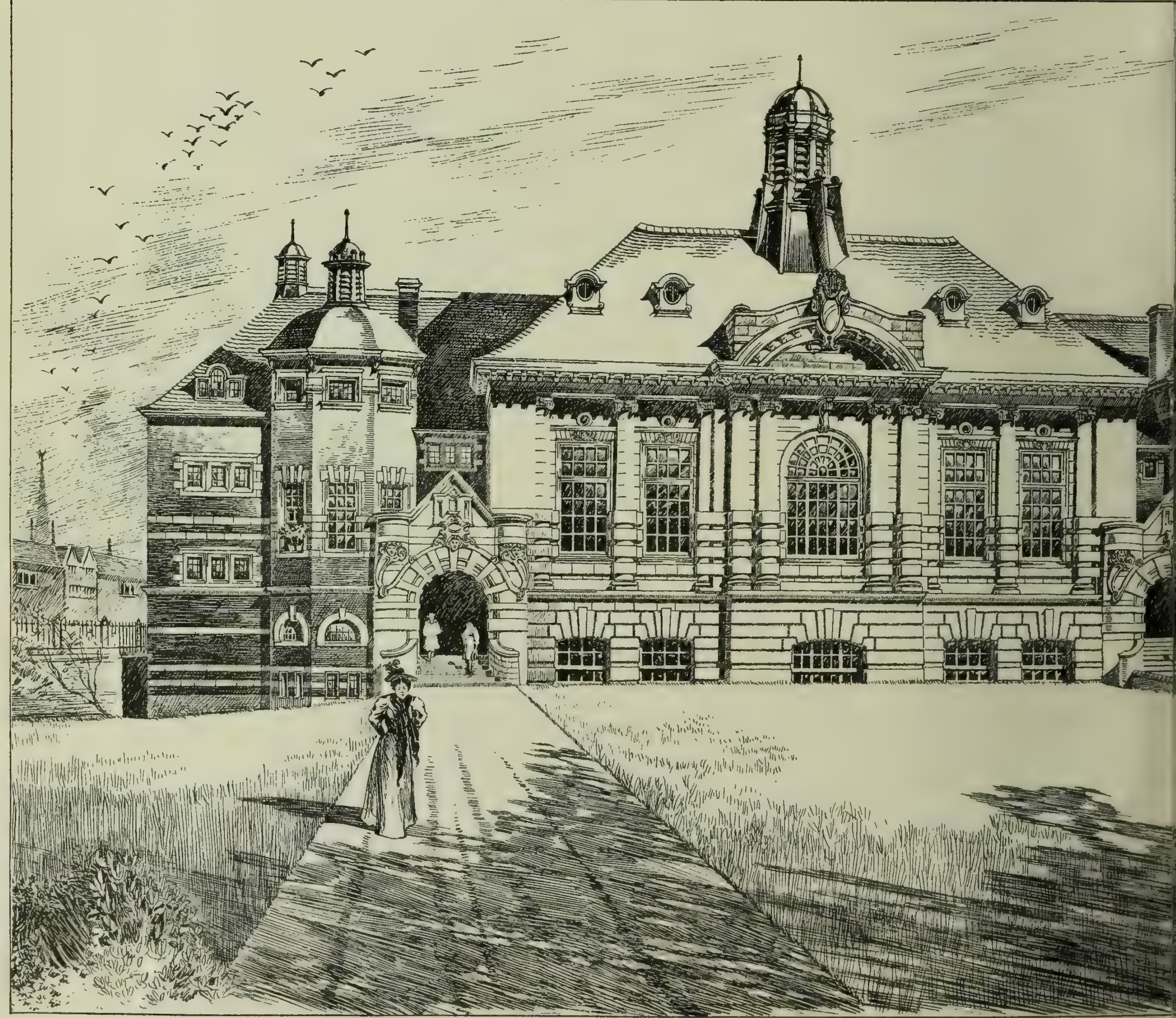
MEASURED· DRAWN· AND PARTLY INKED· ON· THE· SPOT· BY· HERVEY· RUTHERFORD MAY 1898·

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

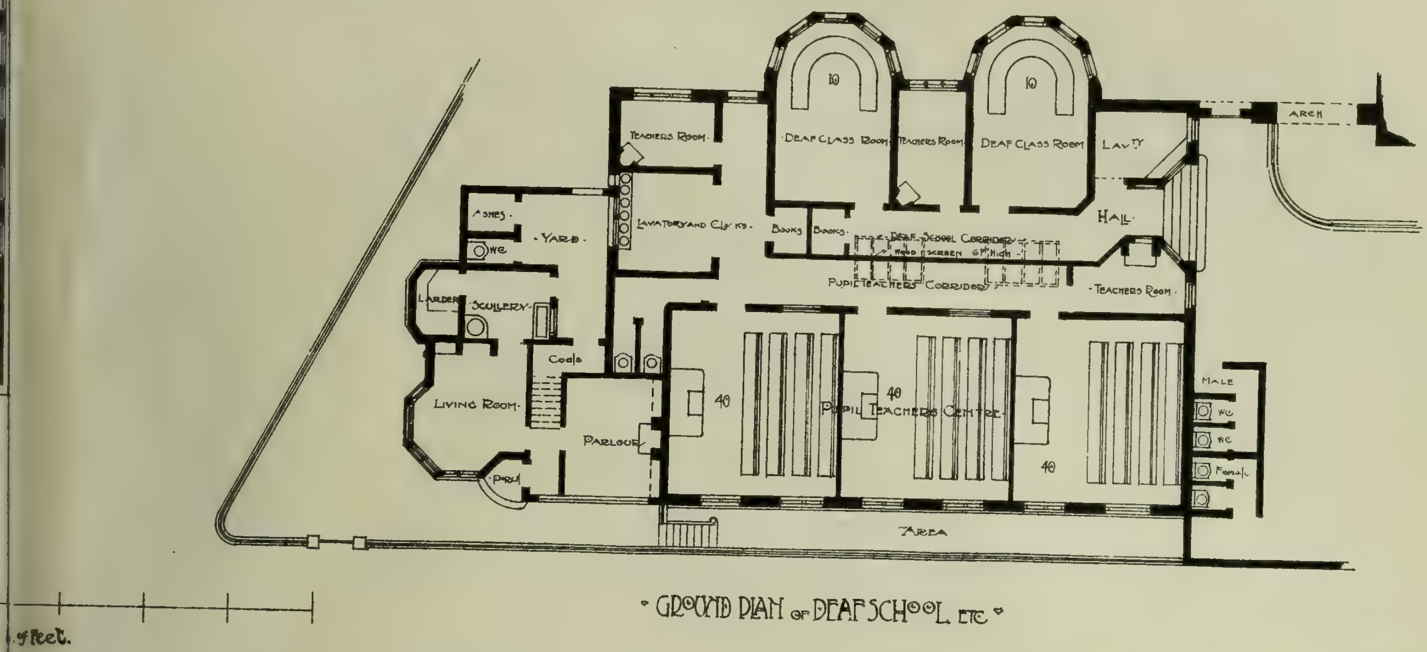
·PUGIN STUDENTSHIP PRIZE DRAWINGS·



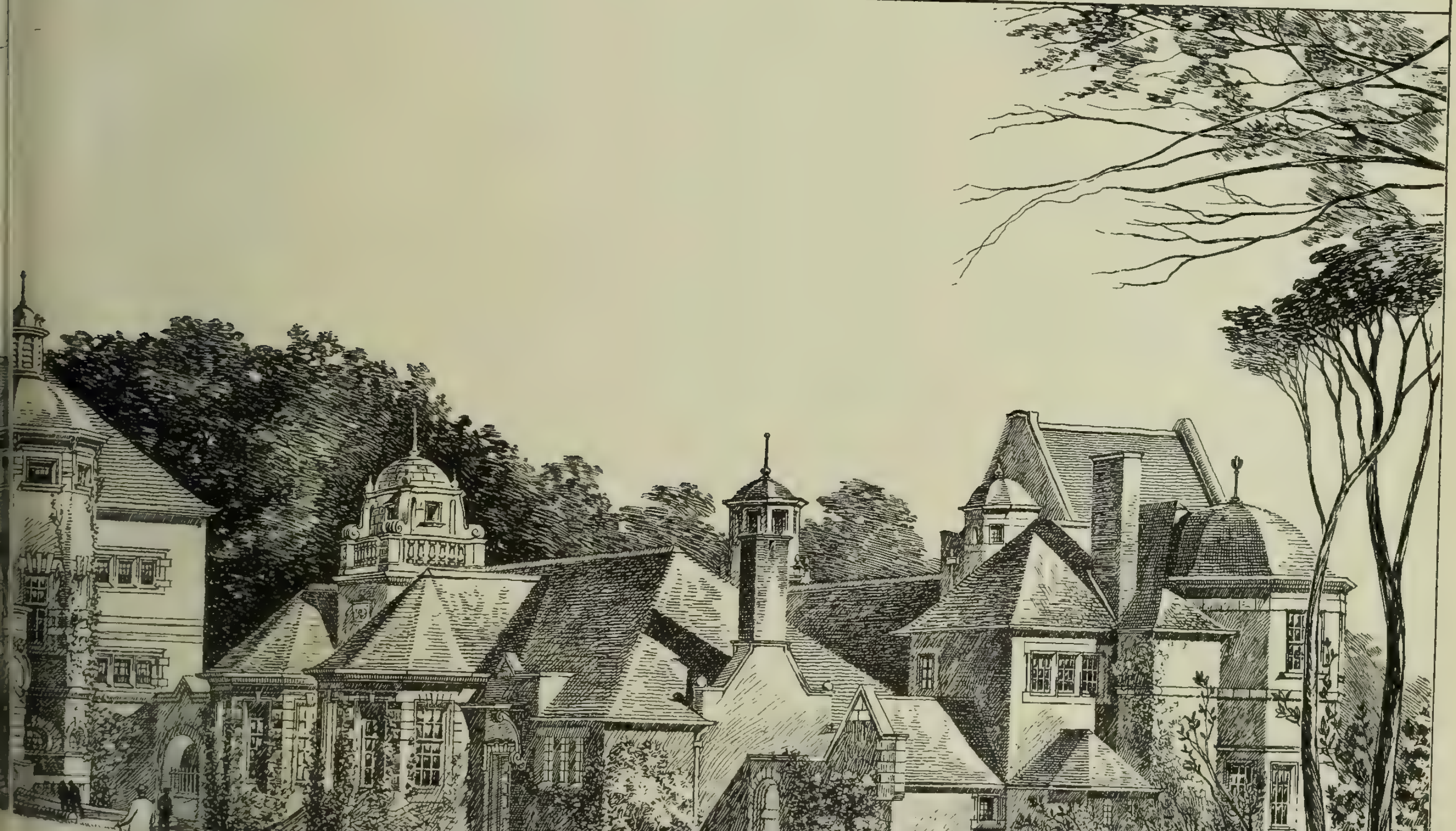
STREET FLOOR PLAN.



NEW HIGHER GRADE SCHOOL DE
ASTON BIRMIN



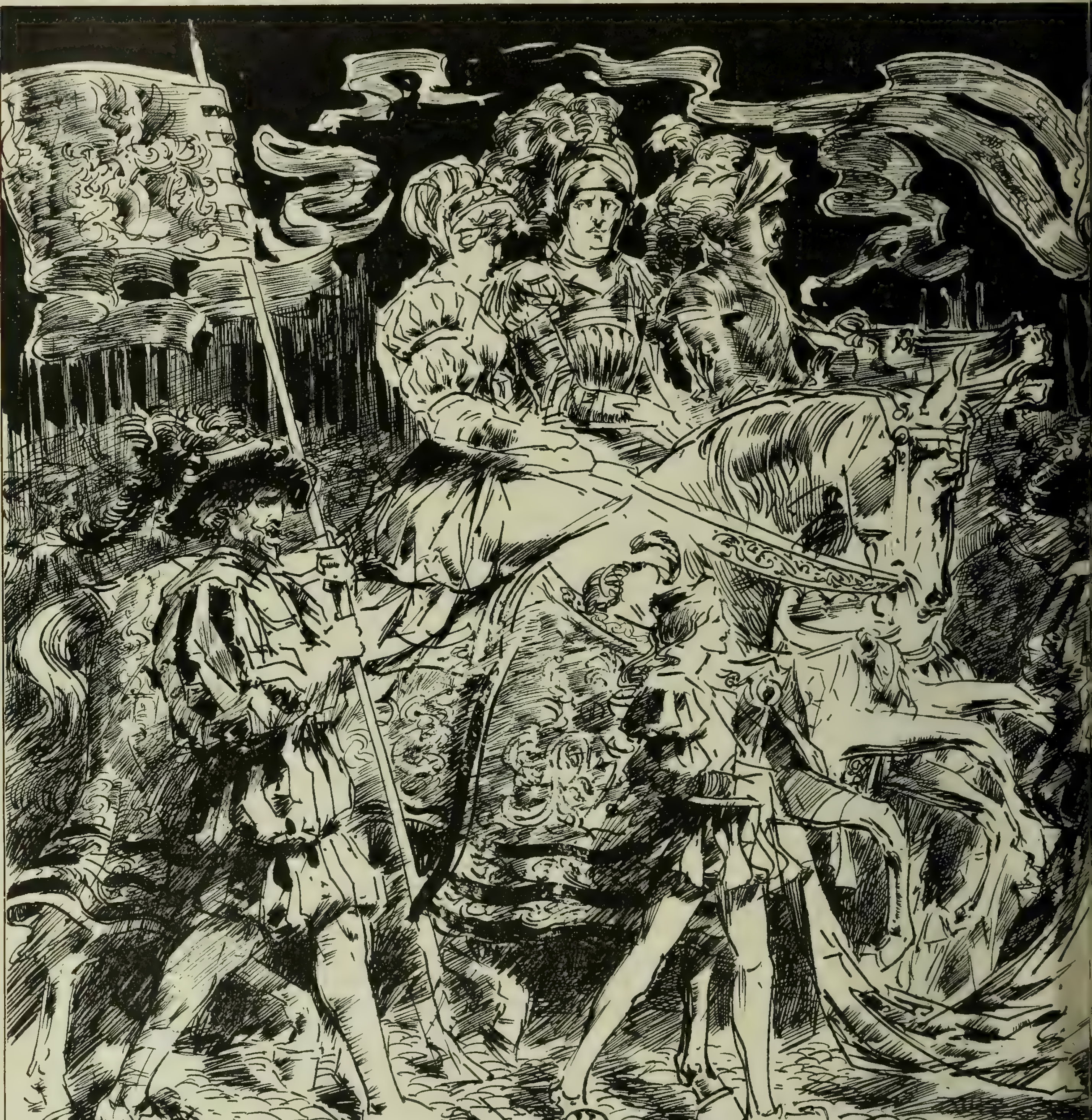
• GROUND PLAN OF DEAF SCHOOL, ETC •



CHOOL AND PUPIL TEACHERS CENTRE

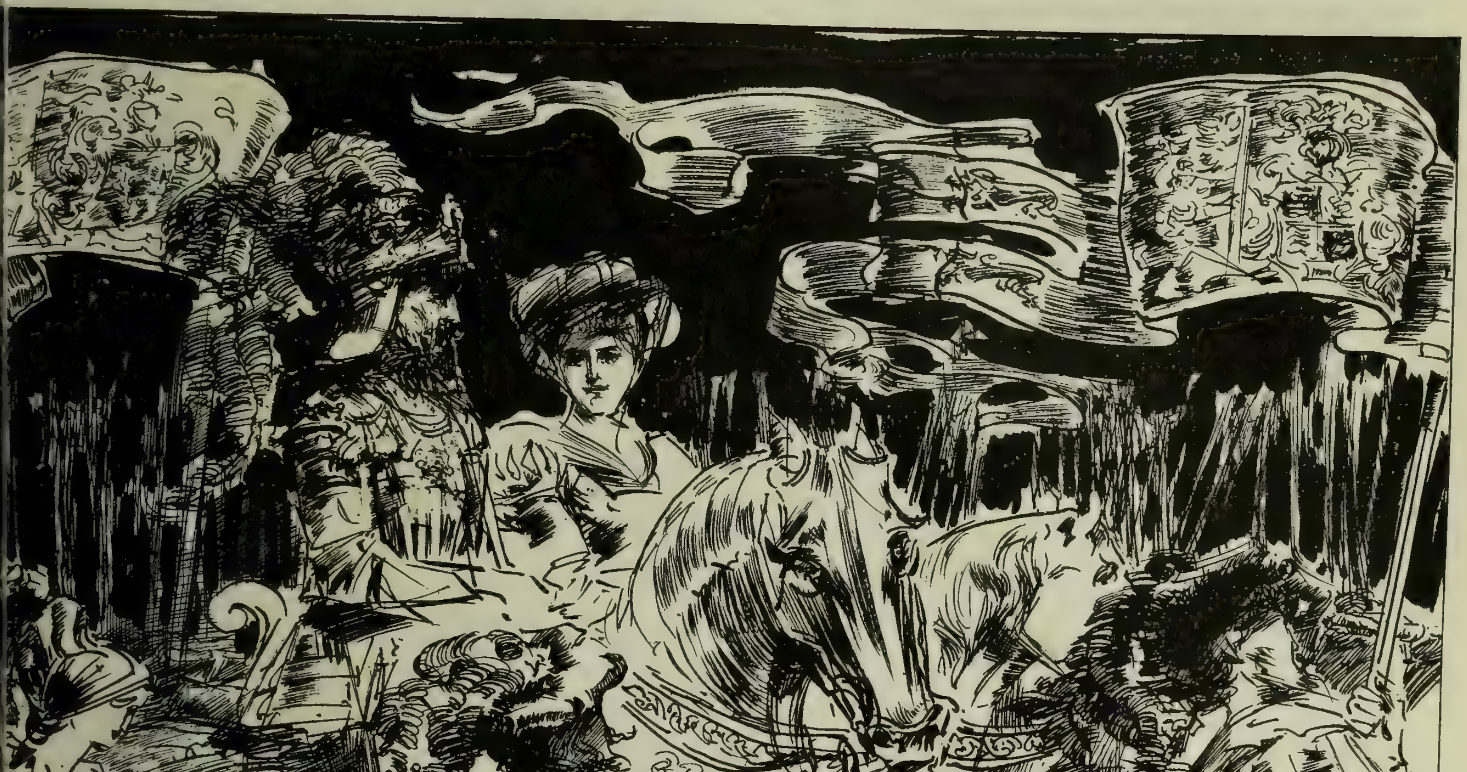
7M CROUCH AND BUTLER ARCHTS

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



PORTION OF FRIEZE PRINCESS

IS. OCT. 13, 1899.



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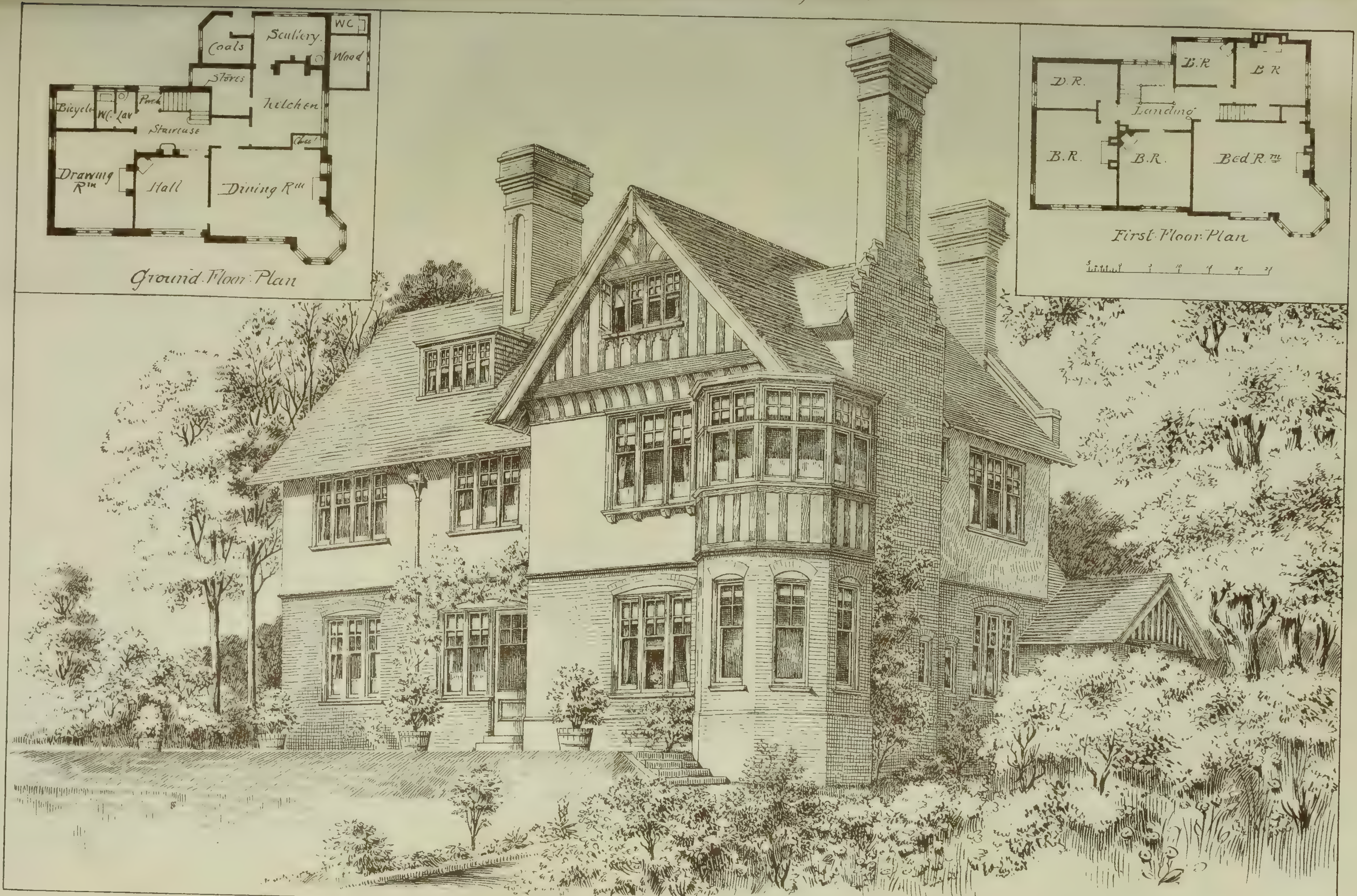
SAURANT PICCADILLY BY H·C BREWER·

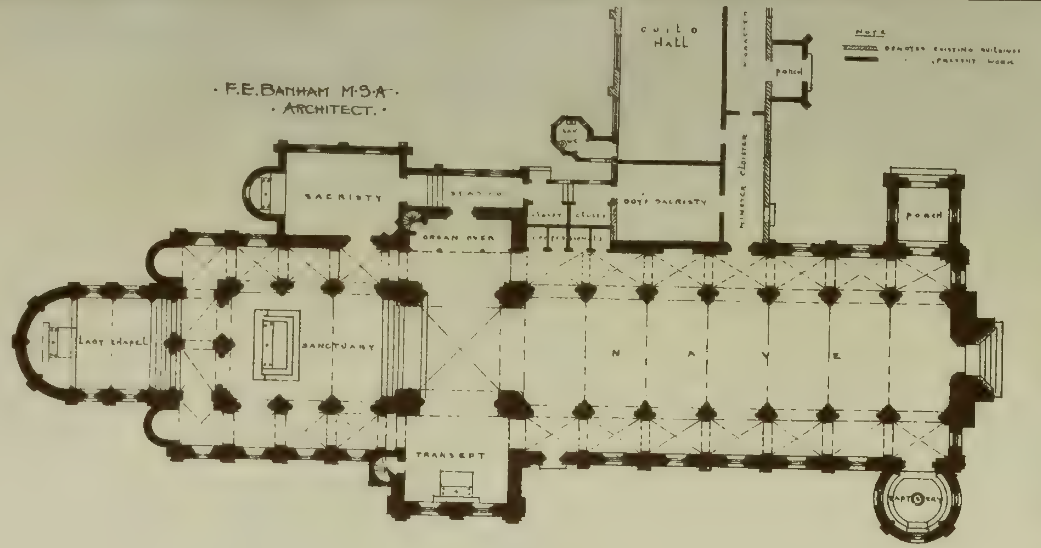


·RESIDENCE AT BRUNDALL NR NORWICH· G·J· AND F·W·SKIPPER ARCHTS

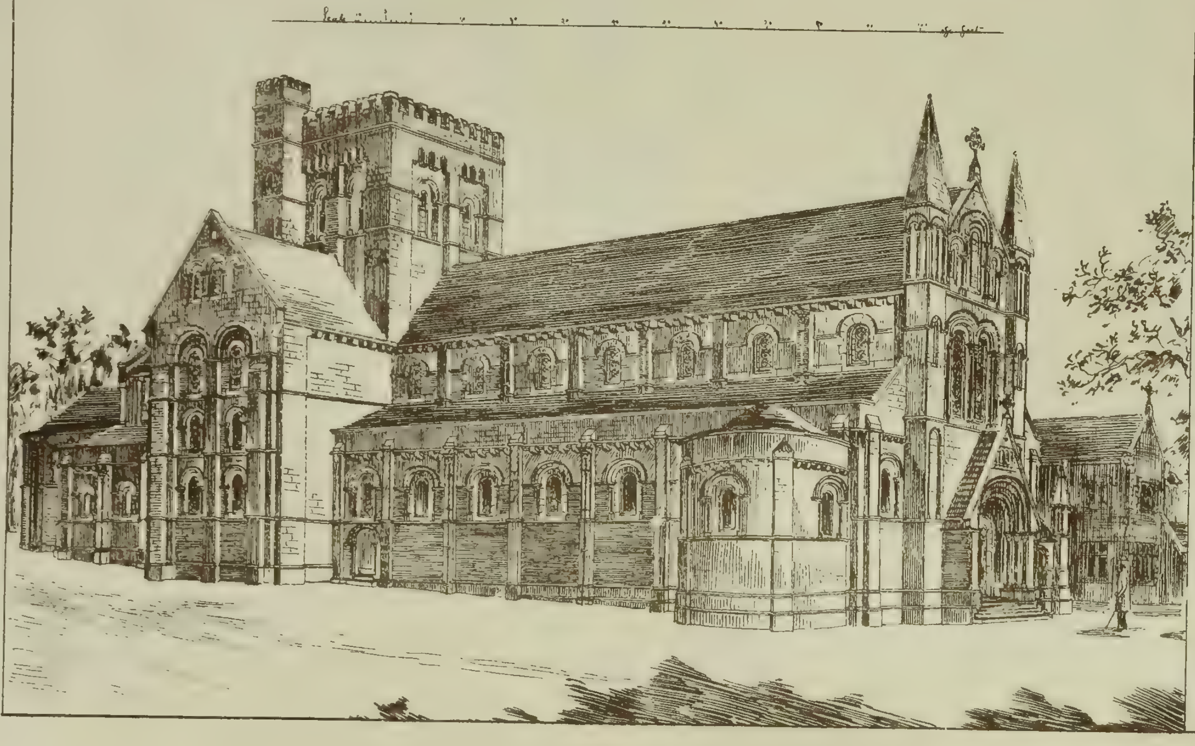
Photo Lith [illegible] Queen Square W.C.

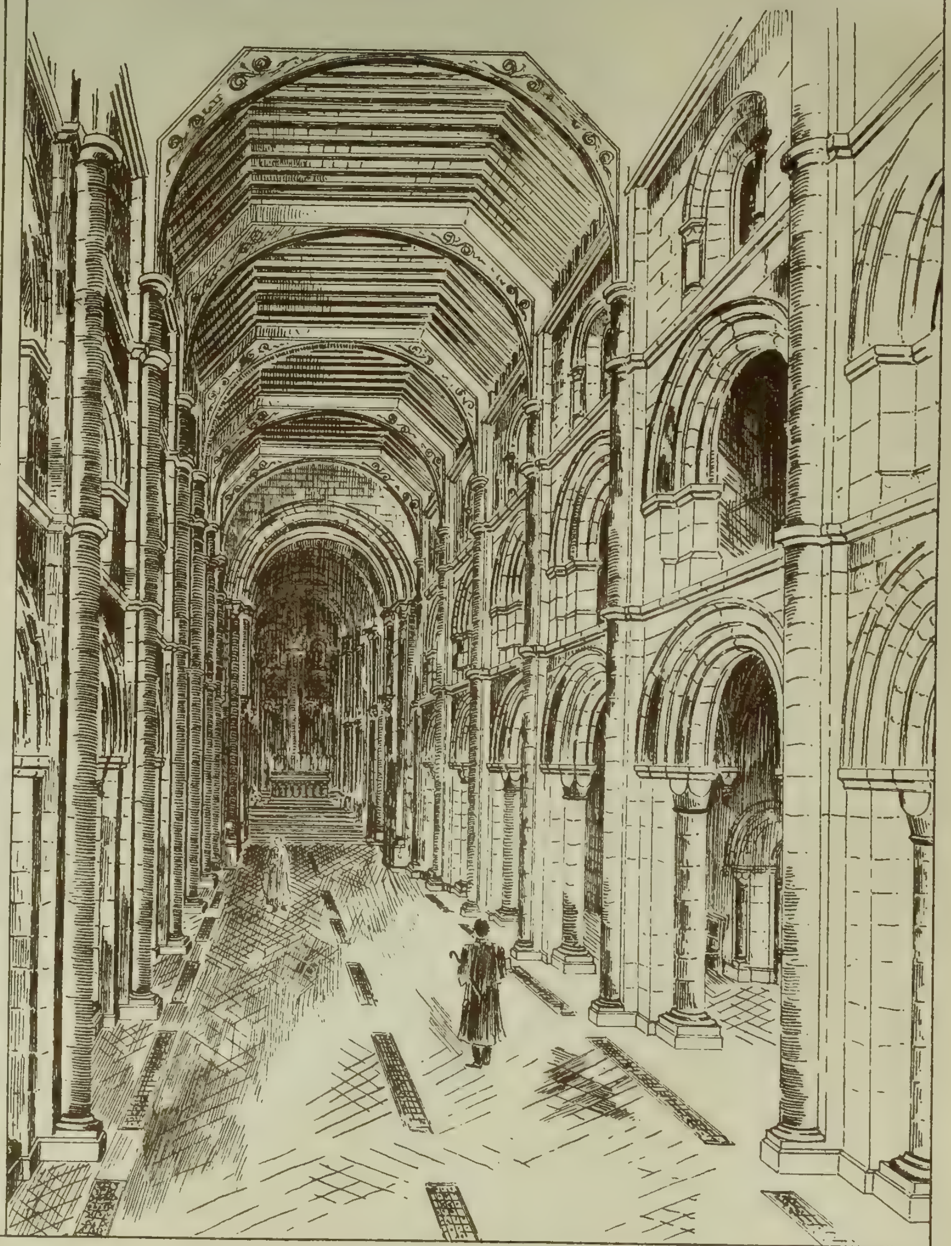
:: St. Benet's Minster ::
:: Beccles ::

· F.E. Banham M.S.A. ·
· Architect. ·



GROUND PLAN





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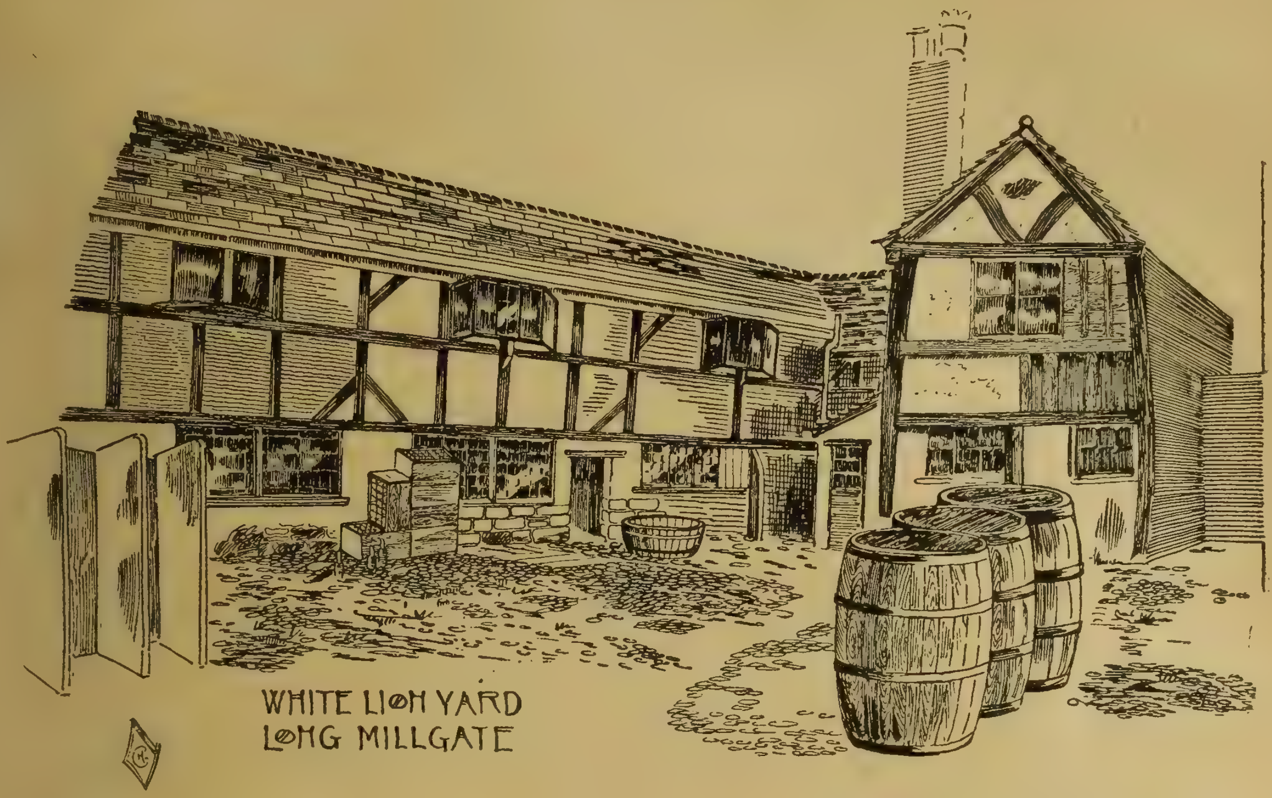
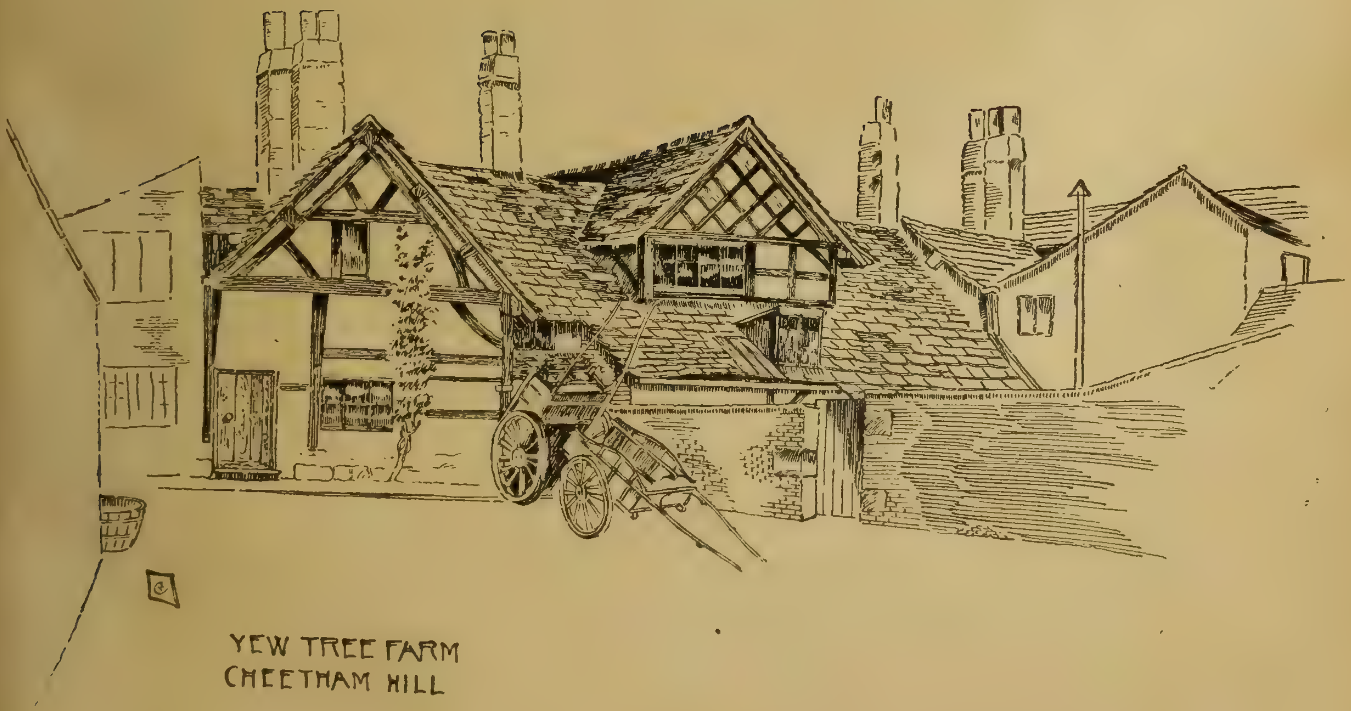


WHITE LION YARD
LONG MILLGATE



YEW TREE FARM
CHEETHAM HILL

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

RECEIVED.—J. A. and Co.—H. and M.—G. S. B.—J. F. and Co.—F. C. and Co.—J. L.—Menthol.—P.—An Exhibitor.—One Who Objects.—Turner.—March.—Docker's Mate.—S. S. Bros.—J. S. and Co.

S. A.—We see no use in discussing it in these pages. The thing is done, apparently with the consent of the majority.

PARENT.—We do not advise you to send your son to him. We do not care to say more, except that you are not likely to get value for your money.

OWNER.—A very good flooring, we believe, about 42s. to 46s. Write the makers, Damman and Washer and Co., 72, Finsbury-pavement, E.C.

IMPERMEABLE.—You don't want wall-ties with the "Hygeian Rock" composition. Write W. White, Great Western Works, Abergavenny.

DOUBTFUL.—We have generally had to take proceedings against them ourselves to get our money. We suppose that is the reason.

R. S. S.—Thoroughly reliable, and very intelligent and capable in their comprehension of an architect's wishes. Yes; the ironwork you mention was done by them.

A STUDENT.—A.'s claim entirely depends on the terms of the first agreement.

SCRIBE.—Yes, we published an illustration of design for writing desk or secretaire suitable for an architect's use in our issue of March 6, 1896.

"BUILDING NEWS" DESIGNING CLUB.

A. S. T. (Competitors may send an alternative design, but it is far better to concentrate your efforts on one good scheme and drawing.)—A. E. BAXTER. (The kitchen for the manager's house may be contrived in the basement. No kitchen is required for the staff, the clerks going out for lunch.)—NORTH SCOTLAND. (There is no objection to a Scotch rendering of the style named. The more diversity the better.)—R. S. YORK FITZJAMES. (Read the rules, which were published in last week's BUILDING NEWS.)

◆

The *Blackburn Weekly Telegraph* is publishing an illustrated series of articles on the "Improvement Problem" in that borough. The first division contains a scheme for town-hall, public-hall, and post-office; but the clever sketches are not signed by the architect who designed them.

Correspondence.

THE LATE MR. JOSEPH CLEVER.

To the Editor of the BUILDING NEWS.

SIR,—I knew the deceased, and am under the impression that he priced the estimates of the important works named, which he was well qualified to do, as in the "fifties" he carried out as builder several important works—one was a chapel in the Queen's-road, Dalston, of which Mr. J. Harrison was architect. Mr. Clever had a good presence, and good practical knowledge.—I am, &c., H. LOVEGROVE.

◆

CHIPS.

A new scheme for constructing an electric tramway from Hammersmith Bridge, by way of Barnes and Mortlake, to Richmond will shortly be submitted to the Richmond Town Council and the Barnes and Mortlake District Council. The promoters are the New Electric Traction Company, of 35, Parliament-street. They propose to construct, for the joint use of the tramways and the public, a new bridge over the railway at Barnes and a street opening up a new approach to the bridge across the river at Richmond.

Foundation-stones of a Primitive Methodist mission-hall were laid in Bristol-street, Birmingham, on Monday. Shops with basements will be built on the ground floor, and between them will be an entrance lobby. The space at the rear is to be occupied with school and classrooms, and up above, covering shops and school, will be the mission-hall. Messrs. James and Lister Lea and Sons are the architects, and Messrs. Gowing and Ingram the contractors. The outlay will be over £6,000.

Miss Dryden, the only daughter of the late Sir Henry Dryden, has confirmed the gift of her father to the town of Northampton of an immense collection of antiquarian manuscripts, drawings, and plans. A special room is to be built for the reception of the collection in connection with the municipal museum.

The Board of Agriculture notify that the Ordnance Survey are issuing a new series of special folding pocket maps for certain towns and country around on the scale of 1in. to the mile. The maps are printed on thin, tough paper, in a cover, price 1s. 6d. each. These maps are not only useful for general topographical purposes, but should also prove serviceable to cyclists and pedestrians, since they show all the roads in colour, indicating their character, and whether metalled or not; footpaths, hills, rivers, towns, villages, railway stations, and local boundaries.

Mr. G. W. Williams, an inspector under the Local Government Board, held an inquiry at the Salford Town Hall, on Friday, with reference to an application of the corporation for sanction to borrow £10,500 for electric-lighting purposes and £850 for improving Bank-lane, Irlams-o'-th'-Height. Mr. John Hall, the architect, gave a description of the proposed electric-lighting station buildings to be erected in Strawberry-road, Pendleton. The front elevation, he said, will be treated in a Free Classical style, with red bricks and stone dressings, and will cost £6,250. Mr. Corbett, borough engineer, and Mr. Whyatt, assistant engineer, gave particulars as to spending of £850 for the improvement of Bank-lane.

Extensive operations are going on for strengthening the western defences of the Isle of Wight. For months past a number of workmen have been engaged in enlarging, strengthening, and improving Warden Fort, situate close to Colwell Bay. The fort will be manned with much larger breech-loading guns of a heavier calibre. Thousands of yards of concrete have been laid by the contractors, Messrs. Denham and Jenvey, the work being done at schedule rates. It is estimated that the work will cost £16,000. It will be another three months before the alterations are completed. All the other forts at the western part of the Isle of Wight are to be similarly strengthened, Cliff End Fort being specially singled out for attention.

On Wednesday week the drinking-fountain erected at the east end of High-street, Chatham, by the Mayor of Chatham, in memory of his father, the late Councillor Joshua Driver, was unveiled by Sir Horatio D. Davies, M.P. The fountain, which measures 14ft. in height, with a base of 5ft. square, is built entirely of blue and red Aberdeen granite, alternately polished and hammer-dressed. In front and on the base is a granite trough for horses. There are four alcoves, with basins under them; three are fitted with drinking apparatus, while the fourth, which faces the High-street, bears an inscription. Four pillars support the projecting corners of the cornice and dome. The latter is a fluted hemisphere, terminated with a pedestal and finial. The builders were Messrs. Garden and Co., of Aberdeen.

Intercommunication.

QUESTIONS.

[11338.]—**Window Tracery.**—Can anyone tell me the publisher of Freeman's "Window Tracery," and if this is the best work on the subject?—PUPIL.

[11339.]—**Oak Floor**—Which is 4in. by 1in. T. and G., laid on counter floor. The oak was ten years old, but, owing to heat of heating pipes, some of the joints opened about 1-32nd to 1-16th inch.—SHRINKAGE.

[11340.]—**Plaster.**—If the width of a church, with inside walls plastered, is to be 37ft., and the walls are 3ft. thick, should not the total width be 43ft. 1½in., or ought the plaster to infringe on the true width?—STUDENT.

REPLIES.

[11336.]—**Architect's Duty to Pupil.**—I am an architect's pupil, and during the eighteen months that I have been articled I have had my principal's constant attention nearly every day. I plan, level, survey, specify, learn quantity surveying, and all other branches of study belonging to the profession. Certainly "Anxious" is being very unfairly dealt with; he is there as a gentleman, and is evidently being treated as an ordinary clerk. I am afraid this is not by any means the only case.—PUPIL.

[11335.]—**Damp.**—If the adjoining owner has built an independent wall, he has abandoned all right to the 4½in. wall, which is called a party-wall in the question; and "Northumbrian's" client should take steps to make his own premises secure. I am assuming that the adjoining owner has properly built his wall, and that the property is outside the London Building Act.—H. L.

[11336.]—**Architect's Duty to Pupil.**—Your correspondent "Anxious" is not the only neglected pupil; but he might politely mention the matter to his principal. In some offices pupils really learn; but generally it is better to attend classes at a college, and then get a situation as an improver.—H. LOVEGROVE.

[11337.]—**Wood-Block Floor.**—There are a great number of patents. Some blocks are set in tar, some with dowels. Why not write to a few firms?—H. L.

[11337.]—**Wood-Block Floor.**—In answer to the query of "Old Subscriber," I would strongly recommend him to have his blocks laid in a hard-setting asphalte, which I have found the only safe way; and of the very few systems, Ebner's patent is the best I have found in a large experience.—BRISTOLIAN.

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Two new churches will be opened at Exeter next month—that of Emmanuel on Nov. 1st, and that of St. David on the 30th.

The Congested Districts Board have intimated their willingness to contribute 75 per cent. of the cost of a new pier at Longhope, Orkney, and the district committee of the County Council have agreed to accept the offer, and comply with the conditions laid down. The pier is estimated to cost over £3,000.

The Mayor of Lichfield has inaugurated the first installation of the electric light which has been introduced to Lichfield. It has been provided by Messrs. Jones and Co., general furnishers, for the lighting of the premises recently acquired by them at the junction of Bore-street and Bird-street, in the centre of the city. The whole of the installation has been designed by Mr. T. Vaughan Hughes, A.R.S.M., of Birmingham, and the electrical work carried out by Mr. E. E. Pugh, contractor, Wolverhampton. Structural alterations to the building have been designed and superintended by Mr. W. Perry, architect, Lichfield. The electric energy is generated by means of an oil-engine burning Noble's petroleum. The engine supplied by Messrs. Tangye, they state, will consume one pint per horse-power per hour.

The new Wellfield U.P. Church, which was opened on Friday, is situated at the corner of Balgray Hill and Murdoch-street, in Springburn, near Glasgow. The building, which is Late Decorated in style, is of red sandstone, and has been erected from the designs of Mr. John B. Wilson, Bath-street, Glasgow. The church is divided into nave and side aisles by wide moulded arches, with organ-chamber at the east end, and seats 800 persons. Artificial light will be supplied by electricity. Behind the church is a hall to accommodate 350 persons, and also classrooms, cloak-rooms, vestry, and session-house. The principal contractors were:—Mason work, Hugh Nelson and Co.; joiner, Thos. Brown; slater, Thos. Muir; plasterers, J. and A. Williamson; plumber and gas-fitter, R. Munro; mosaic work, Mainzer and Co.

A memorial monument to Helen Faucit (Lady Martin) has been placed in Llantysilio Church, near Bryntysilio, in the Vale of Llangollen, where Lady Martin died in October last year. The monument consists of an alto-relievo, designed by the late Mr. J. H. Foley, and represents the subject seated with a half-open volume in her hand, a medallion of Shakespeare's head resting against the chair on which she is seated, and with masks of Tragedy and Comedy at the upper corners of the entablature. The work was designed by Mr. Foley a year or two before his death from sittings given him by Lady Martin, and it has been reproduced in white marble by Mr. J. Hughes, of Dublin.

LEGAL INTELLIGENCE.

A Dispute Between Keighley Builders —In the matter of Smith and Whitaker, contractors, Keighley, against William Ward, builder, Keighley, between whom a series of involved building transactions had taken place, it was reported at the county court on Friday that Mr. J. B. Bailey, architect, Keighley, to whom the dispute had been referred, had awarded the plaintiffs a net sum of £42 18s. 5d.

Important Building Dispute.—Application in the Vacation Court.—Injunction Granted.—The case of Leveson-Gower v. Sewell came before Mr. Justice Darling, sitting as Vacation Judge, on Wednesday, on an application by the plaintiff, the owner of a building estate at Limpsfield, Surrey, for an interim injunction restraining the defendant until the trial from building on the estate in alleged contravention of a covenant contained in a contract. Mr. Mulligan, Q C., appeared in support of the motion, and Mr. Alexander, Q.C., for the defendant. Mr. Mulligan said that the object of the action was to restrain the defendant from building without the approval of the plans by the plaintiff's architect, Mr. Stenning. The plaintiff was the owner of an extensive estate of 7,000 acres at Limpsfield, which had been laid out for building, and, as was usual in such cases, the plaintiff stipulated that the estate should be built upon according to his directions, and inserted in the contracts a covenant that the plans, elevations, and specifications and other matters should be submitted for the approval of his architect, and in the present case the defendant entered into a covenant in that respect. The covenant, as set out in the plaintiff's affidavit provided, shortly stated that the defendant, as purchaser, was to build, within one year from the date of the contract, at his own expense, a messuage or dwelling-house, and all necessary outhouses according to plans, elevations, and specifications, which were to be submitted to and approved by Mr. Stenning, the architect of the plaintiff, as vendor, or other the architect for the time being of the plaintiff. It was also provided by the contract that the defendant should spend about the buildings £1,000 at least. What happened was this: plans, &c., were submitted to Mr. Stenning, but that gentleman, thinking that such a building as was proposed to be erected would be injurious to the estate, pointed out the defects to the architect of the defendant. The defendants' architect, however, wrote a letter in which he declined to modify the plans, and said that his reputation was at stake, and so forth, and he refused to make plans in accordance with the suggestions of Mr. Stenning. What Mr. Stenning said was that the house proposed to be erected by the defendant would be an eyesore to the place, and would be injurious to the whole of the estate. Rightly or wrongly, the defendant had agreed to make Mr. Stenning the sole judge in the matter. The plaintiff and the defendant had entered into an express contract whereby the plans were to be submitted for the approval of Mr. Stenning, and counsel would submit, if necessary, that the building proposed to be erected would be a hideous structure. His Lordship: I do not think I could go into that, because it is a matter of taste. I might prefer one style of architecture and Mr. Alexander's client another. Mr. Mulligan: Yes, but here there is a positive covenant, and the defendant refuses to comply with it, and I ask for the interlocutory injunction. Mr. Alexander, for the defendant, said that he based his defence on two grounds. First, he said that the plaintiff himself had frustrated the performance of the covenant by the defendant by unreasonably withholding his consent to the plans. The right of approval must be exercised reasonably, not capriciously or arbitrarily. His Lordship would see, on looking at the covenant, that the defendant was bound to spend £1,000 on the building at least, and, therefore, he was not bound to spend more than £1,000. Having regard to that, it was acting unreasonably to prevent the defendant building with the handsome elevation he proposed. He (counsel) thought he should be able to show his Lordship that the plaintiff's right of approval had been capriciously and arbitrarily withheld, and that, therefore, the defendant was released from the obligation of the covenant. His second point was that the plaintiff could not, having regard to what had taken place, get an interlocutory injunction in this matter. On August 9, after the defendant had submitted his plans and modified them as far as possible to meet the plantiff's objections, the defendant was advised that the plaintiff's approval of the plans was unreasonably withheld, and he commenced his building, giving the plaintiff distinct notice that he would accept the service of any process he might like to issue. The plaintiff saw the defendant's building rise and rise until the elevation had been made, and it was not until Sept. 19 that he issued his writ. Having regard to the delay that had taken place, he submitted that the plaintiff was not entitled to an interlocutory injunction. His Lordship: Are there objections to the first and second floors, or to the roof? Mr. Alexander said that they did not object to the plans of the house, but they objected to the elevation on the ground that it was not countrified enough. His Lordship: What is countrified near London? Mr. Alexander: They say the house is too much of a suburban character, and that they want a much more countrified-looking house. They say they want a handsome country house of a refined character. His Lordship: Something like Haddon Hall? What does Mr. Stenning say? Mr. Alexander: He says that the house we propose to erect is ugly and common, and injurious to the estate. He wants half-timbered gables, amongst other things. The learned counsel went on to state that the defendant was spending some £3,200 on his building, which he required for the accommodation of his family. One of the things which Mr. Stenning objected to was a lantern which was to be erected on the top of the house. His Lordship: Is your client much attached to the lantern? Mr. Alexander said that he was, and submitted that, owing to the delay which had taken place in commencing proceedings, no case had been made out for an interlocutory injunction. Mr. Mulligan having replied, his Lordship, in giving judgment, said he quite agreed that Mr. Stenning ought not to act unreasonably in withholding his consent to the plans, but on the materials before him he could not say that he had acted unreasonably. He felt bound to say he could not see that Mr. Stenning's objections to the plans were either unreasonable or vexatious objections. He did not go the length of saying that Mr. Stenning would have the right to insist on every one of his objections on discussion of them; but as the case stood at present it was perfectly clear that the defendant had not complied with the covenant, but had gone on building at his own risk, and if he suffered any inconvenience through it, it was the result of his own action. He should grant the injunction in the terms of the notice of motion, excluding the mandatory part, and make the costs costs in the action. Order accordingly.

CHIPS.

Mr. C. G. Hyde, a member of the firm of Pearson and Son, Ltd., contractors, has been adopted as the second Liberal candidate for Southampton at the next General Election.

The Jubilee picture painted by Mr. Andrew Gow, R.A., for the City Guildhall Art Gallery, will be presented by the donor, Mr. Henry Clarke, on Wednesday next, the 18th inst. The Lord Mayor will receive the picture on behalf of the corporation.

A new organ by Messrs. Ingram and Co., Hereford and London, which has been placed in Buccleuch parish church, Edinburgh, was formally opened on Friday.

A new building for the Chartered Bank at Bombay will be commenced immediately from the designs prepared by Mr. F. W. Stevens, C.I.E., of that city.

Mr. J. B. Williams, of the Decoy Farm, Borough Fen, surveyor to the Soke of Peterborough County Council, died on Wednesday week, having attained the advanced age of 79 years. The cause of death was senile decay.

It is proposed to erect an hotel at Cairn Gloose, St. Just, near Cape Cornwall. The hotel will contain coffee rooms, dining, billiard room, and drawing room, and on the first floor are to be 22 bedrooms, with flat asphalte roof above to be laid out as a promenade. The architect is Mr. Henry Maddern, of Clarence-street, Penzance.

Mr. P. C. Cowan, M.I.C.E., one of the Local Government Board inspectors, held an inquiry at Cork last week as to the application of the corporation for sanction to a loan of £6,100 for the purpose of the erection of public baths. Mr. H. A. Cutler, the city engineer, stated that it was proposed to construct two swimming baths, 75ft. by 30ft. each, with a depth of water of from 3ft. 6in. to 6ft. 6in., on a site in Elington-street at the rear of the municipal buildings.

Another church is about to be demolished in Liverpool—that of St. Andrew, Renshaw-street, which is about to disappear, having been purchased by the Cheshire Lines Committee.

At a meeting, on Tuesday, of the London County Council, the Asylums Committee brought up a report with regard to the necessity for additional asylum accommodation, recommending an expenditure of £1,000 for inquiries and preparation of preliminary designs, the estimate to include the cost, if any, of visiting foreign asylums. After a long discussion the recommendation was agreed to.

On the Feast of St. Michael and All Angels, the new almshouses and chapel, recently built for the poor of St. George's parish, Ramsgate, were formally opened by the Bishop of Dover. The whole cost of construction and endowment is provided for under the will of the late Mrs. Barber, of the Vale, Ramsgate, who bequeathed her residuary estate, exceeding £15,000 in value, for that purpose.

Our Office Table.

A special meeting of the London County Council will be held on Tuesday next, when resolutions will be submitted in favour of an application being made to the Board of Trade for an order authorising the construction of four light railways to be worked by electric traction in the county of London, chiefly to carry the existing tramways to the county boundary. Their total estimated cost is £635,100, whilst the cost of the acquisition of property for the necessary street widenings is estimated at £130,900. Only one new line is contemplated north of the Thames. This will run from the present tramway terminus near the Archway Tavern, *viâ* Archway-road, Islington, to the county boundary, to form a connecting link between the Council's northern tramways and the light railways in Middlesex, with regard to which applications are now before the Light Railway Commissioners. South of the Thames there are proposals for three new lines. The first will run from the present tramways at Clapham Common, south side, *viâ* Battersea Rise, Wandsworth Common, north side, and East-hill to West-hill, and from West-hill, *viâ* Kingston-lane, to the county boundary. Another line will start from the present lines at Deptford and travel, *viâ* Blackheath-road and hill and Shooter's Hill-road, to the Herbert Hospital; thence, *viâ* Woolwich Common-road, Thomas-street, and Green's-end, to Beresford-square, Woolwich; returning along New-road, Mill-lane, and Woolwich Common-road to the hospital. The fourth proposal is for a new line from the present tramways at New Cross-road, *viâ* Lewisham High-road, Loampit-hill and vale, Lee High-road, and Eltham-road, to a point near Wellhall-lane and Eltham.

Writing in the editorial columns of the *Exeter Flying Post*, "Touchstone" says:—The technical world is up in arms at the prospect of the restoration of our Guildhall being intrusted to the supervision of Mr. Cameron, "a sewage expert." The *British Architect* has its chief leader on the subject, and the *Builder* and Building News are also much agitated over the matter. A good deal of this disturbance of mind arises from misconception. Mr. Cameron is a surveyor, and has had a good deal to do with the preservation of the Guildhall. It is also to be remembered that the Society for the Preservation of Ancient Buildings has sent its architectural expert to see into the matter, and the work will be carried out in accordance with suggestions made by him. I suppose an architect would be the right man to direct operations, but no architect, I think, has such a close acquaintance with the Guildhall as Mr. Cameron, and the restoration is not to be a rebuilding.

The town council of Ayr, like many other corporate bodies, delights when in committee in suggesting to architects that further reports and detailed plans would be appreciated; but when the bill of charges for the extra services is submitted, the national characteristic disinclination to part with the bawbees is manifested. At their meeting on Monday the members of the Ayr Corporation discussed at great length an account from Mr. Hippolyte J. Blanc, R.S.A., Edinburgh, amounting to forty-five guineas, of which thirty guineas was the fee agreed upon for preparation of plans, and a report on sites for the new town hall, and fifteen guineas for "supplementary" plans and a report. The finance committee recommended that only £31 10s. be paid for the original report, the other work not having been, it was alleged, formally authorised. In the stormy discussion which followed, it was contended that as four members of the committee instructed Mr. Blanc to prepare the further plans they ought personally to pay the extra charge, and the Dean of Guild, although a member of the committee, disclaimed all liability for the additional fee. Other members said that instructions were given, and Mr. Blanc ought in fairness to be paid; but after some debate it was decided by 13 votes to 5 to repudiate the committee's instructions, and pay only the thirty guineas. So the guid people of Ayr rejoice, having cannily saved their saxpences, and obtained plans free of charge from a brither Scot.

Every Thursday and Saturday afternoon, says a correspondent of a Nottingham journal, there is a curious spectacle to be seen in one of the outlying districts of Northampton. The congregation of Christ Church is building a new Sunday-school and parish-room. That in itself is nothing extraordinary, one may say. But the church-workers are erecting the buildings with their own hands. Christ Church is a new edifice situated in a new parish. It was only opened twelve months ago; but the work has so developed that it has been found necessary to considerably extend the parochial buildings. There was no money in the treasury, but the church council were equal to the occasion. They decided to erect the much-needed building themselves, with the assistance of volunteer labour. The firm of contractors which built the church offered to supply the materials at cost price, and a portion of the fund required to pay for them was guaranteed by the vicar. The plans were prepared for nothing by a member of the congregation, who is an architect. A few days ago the work was taken in hand, when a small army of volunteers attended and dug out the foundations. The work is now proceeding merrily. Bricklayers belonging to the church are doing such labour as can only be done by skilled artisans, and the hods of mortar are carried to them by gentlemen well known in the business circles of Northampton. Two of the most conspicuous workers are the vicar and the master of the grammar-school.

Mr. F. R. C. Hutton writes describing the results of the recent excavations by the Austrians at Ayasolouk, the site of Ephesus: "The great theatre has been excavated, the whole of the columns of the proscenium and the passage and ante-room with mosaic pavements have been opened up, and work is going on still in the upper portions of the theatre. In front is the street, with the marks of chariot wheels all along the pavements. There are also the whole series of buildings behind and underneath the gymnasium, including some marble water-troughs with oxen and oak wreaths, and some fine marble doorways all *in situ*. But perhaps the most interesting thing is that which is now being excavated—the semicircular marble portico with its steps, which occupied the whole east side of the harbour. What there is now is most beautiful and interesting, and each week discloses something new."

"The Earliest Period of Man's History in Egypt" is the subject of a course of lectures by Professor E. Flinders Petrie at University College, inaugurated on Thursday in last week. The questions of the early condition of the land when first occupied by man were first dealt with. The depth of the gorge of the Nile is such that the cliffs rise considerably above the level of Khartoum, which is many hundreds of miles further south. The whole of the gorge has been excavated by the Nile. After the carving of the country into its present shape, but with a gorge 50ft. or 100ft. deeper, now filled by the Nile mud, the whole country was submerged, probably to 500ft. lower than now. During this age of submergence man can first be dated in Egypt, as rolled palæolithic flints have been found at high levels. The same class of ability of palæolithic man continued until the land was as desert and dry as at present, as large washed flints are found left behind at low levels. The incoming of the civilisation which we can trace through into historic times does not belong really to the "neolithic" age, as strictly defined, because copper was used in the earliest graves yet found. What started civilisation at this particular time, about 6,000 B.C., in the Nile valley is not yet clear. But it is significant that the depth of Nile mud deposits—which are known to accumulate at one mètre in a thousand years—is about seven or eight mètres. This would imply that there was no fertile mud soil in Egypt until about the age of the beginning of the civilisation. And thus it would be fruitless to expect that any but a few nomad hunters could live in a valley of sand and stones where a few trees would be the only vegetation. The stages of man's history in Egypt therefore are:—(1) During the submersion of the valley; (2) during the age of rainfall and fertile highlands; (3) during the deposit of the Nile gravels, when the beginning of neolithic work appears; (4) during the drying up of the Nile, when fertile mud was deposited, making agriculture possible—at this time copper was in use, and the civilisation is continuous to the present day.

Glasgow Corporation held a further special meeting on Monday to consider the building regulations which it is proposed to bring before Parliament in the shape of a Bill. Mr. Paterson called attention to clause 40, which, he said, would shut up half of the sunk flats in Glasgow. Half of the self-contained houses in the West End had apartments for servants under the level of the street. Mr. Primrose, convener of the special committee, replied that the clause did not apply to self-contained dwelling-houses. It was explained, in answer to questions, that the Act was not retrospective. The discussion on the various clauses turned for the most part on matters of phraseology, and after a sitting of an hour and a half the Corporation adjourned until to-day (Friday).

A syndicate of foreign capitalists is said to be about to invest a large sum of money in building apartment and tenement houses in New York. The operations of the syndicate will be on a large scale, the buildings being of such a size that interior courts, 100ft. square, can be provided for every house. The first house to be built is for wealthy tenants, and is to occupy a whole block, between Fifth and Madison Avenues. If this proves successful, one of similar dimensions, but in a less fashionable location, will follow; and last of all, tenement-houses, for working people, are to be erected. It is asserted that unlimited capital is at the disposal of the syndicate, and that architects in Paris and New York are now at work perfecting the plans of the new buildings.

A conference of trade unionists and co-operators, at which between 60,000 and 70,000 workers were represented, was held at Birmingham, on Saturday, to consider the question of the housing of the working classes and kindred subjects. A resolution was passed urging local authorities to use the power, they possess under the Better Housing of Working Classes Act, and by this means bring good houses at low rents into competition with insanitary houses at exorbitant rents. The principle was also affirmed of complete public control of the land as a remedy for overcrowding in towns.

At Plymouth Town Council meeting, on Monday, a long discussion arose relative to the main drainage scheme, in connection with which it was proposed to spend £87,000 upon a portion of the work, the tenders for the whole being very much in excess of the £100,000 which the corporation had obtained sanction to borrow. It was decided to refer the matter back with an instruction to the committee to present further information at the next meeting. A feature of the meeting was that Mr. Mansergh, C.E., reported that there were astounding blunders in some of the seven tenders sent in. The lowest one, from J. Dawson, which appeared as £106,300, contained errors in the cast-up amounting to over £17,000, and should have been totalled at £125,369; the next lowest, from W. C. Shaddock, stated at £107,123, should similarly have been £124,357; and the next, from J. Shaddock (recommended for acceptance after omitting certain streets) showed an error of £7 only, £111,307 instead of £111,300.

The highest tower in the world is presently to be built as one of the great attractions of Buffalo during the Pan-American Exhibition, which is to be held in the city in 1901. It is to be 1,152ft. high and 400ft. square at the base, and will be served by no fewer than 33 electrical elevators, 16 of which will run only to the first landing, 225ft. above the level of the ground. The whole journey from the bottom to the top will necessitate four changes of elevators, and will take about six minutes, while the elevators will have a carrying capacity of 10,000 an hour. The estimated cost of this tower, which will be built of steel, is £160,000, or about twice as much as that which was involved by the erection of the Eiffel Tower.

An interesting architectural and decorative experiment is being tried in connection with St. Margaret's Mission Church, South Coburg-street, Glasgow. The exterior of the building is to be adorned with coloured panels depicting religious subjects. It has been found that the usual class of tile paintings, when exposed to a city atmosphere, were not always satisfactory from their want of permanence, the somewhat soft material of which the tile was manufactured and the comparatively low heat at which the decorations were baked both combining to lead to defects which became more and more apparent as time went on. As regards ceramic materials, none but those that had received the severest firings would, it is clear, have much chance of permanence. Messrs. Doulton and Co. have sought to carry out on a stoneware basis the method of decoration known as majolica painting. As carried out by Della Robbia and other Mediæval potters, the process consisted in covering a slab of terracotta with a thin coat of an opaque white enamel. Upon this coating the paintings were executed, and, on being subjected to a second firing, the painting and the enamel surface were fused into one. Majolica, however, does not admit of being fired to such a degree of hardness as is desirable for exterior decoration in these climates, and Messrs. Doulton's experiments have led to the preparation of a hard stoneware body and an enamel covering which can be fired at the same stoneware heat as the body itself and in the same kilns. Paintings fused at such an intense heat as this are not likely to be attacked by the deleterious acids found in town atmospheres, and the decorative scheme once decided upon will remain permanently enshrined.

According to the *Scientific American*, Philadelphia can boast of the longest asphalted street in the word. Broad-street has that unique distion. First, as already stated, it is the longest asphalted street in the world; secondly, it is the only street which is of even width for 11 miles, and this width is the greatest ever attained by any street for a course of 11 miles. It is also the straightest street, for from League Island to the county line it does not vary an inch, except where the great City Building causes the street to turn around it. Seven miles of the street are asphalted, but the remainder is provided with a roadbed of fine macadam, which is continued by the old York-road, which extends for about 20 miles farther on. A carriage can drive on this street and road and make only one turn in 31 miles. Broad-street is 113ft. wide and measures 69ft. from curb to curb, and 35 men can walk abreast on it.

An ingenious and simple method of fixing metal screws into stone walls has been devised. Wooden dowels, beside the tendency to weaken the walls, do not afford security and permanence. A wire of suitable thickness is coiled on the screws so as to follow the threads of the same, and form a kind of screw nut. The coiling may commence near the head of the bolts and proceed towards the point by laying the wire into the grooves. After arriving at the point of the screw the wire may be wound backward over the helix already wound on, but with a steeper pitch, so as to leave wider interstices between consecutive convolutions of the wire. This wire coil or nut is introduced into the hole formed in the wall for this purpose, being slightly wider in diameter than the outer layers of wire, after which the surrounding spaces are filled up with plaster of Paris, cement, or similar binding material in a plastic condition.

MEETINGS FOR THE ENSUING WEEK.

Friday.—Architectural Association. Conversazione at King's Hall, Holborn Restaurant. 8 p m.

Saturday, Oct. 21st. — Architectural Association of Ireland. Visit to Richmond Surgical Hospital, North Brunswick-street, Dublin (Messrs. Carroll and Batchelor, Architects). 2.45 p.m.

The new schools of science and art, Newark, are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

It is reported from Washington that the committee of architects appointed to adjudicate upon the plans for the new Custom-house in New York has selected those of Messrs. Carrère and Hastings and Mr. Cass Gilbert.

The annual dinner of the Hastings and St. Leonards Borough Association, on Wednesday night, was attended by Mr. Akers-Douglas, M.P., who, in replying to a toast, referred to the amalgamation of the South-Eastern and Chatham and Dover Railway Companies, and announced that at Hastings station large works had been authorised. The directors also proposed to increase the width of the railway from four to six lines at Tonbridge, and to eight at Ashford Junction; also, to make a junction at Sissinghurst between the two lines, which would save fifteen or twenty minutes between Hastings and Victoria. They were engaged, too, in widening the line to four sets of metals from London to Orpington. Altogether, the improvements contemplated would involve an expenditure of three millions.

LIST OF COMPETITIONS OPEN.

Paignton—Pavilion and Stand for 400 Persons (limit £800)	£15, £5	G. Barnston, Clerk, Town Hall, Paignton	Oct. 16
Blackpool—Revoe Board School (1,000), Central-road		T. Loftus, Clerk to School Board, Town Hall, Blackpool	,, 17
Elland—Baths on South House Estate	No first ; £20, £10	The Clerk, U.D. Council Offices, Elland	,, 28
Horley—Fire-Engine Station	£10	Robert L. Love, Solicitor, Clerk to Parish Council, Horley, Surrey	Nov. 1
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	,, 30
Bury, Lancs—Infectious Diseases Hospital, Bolton-road (limit £12,500 ; Assessor)	£100, £50, £25	The Borough Engineer, Corporation Offices, Bank-street, Bury	Dec. 1
Broughton Moor—Institute and Twenty Cottages		The Flimby Colliery Company, Maryport	—
North Cave, Wallingfen, and Broomfleet—Water Supply	£10 10s.	Henry Green, R.D.C. Clerk, Howden	—
Leicester—Workhouse Infirmary (360 patients) and Imbeciles' Home (150 patients)	£100, £50, £25	The Clerk to Board of Guardians, Leicester	—

LIST OF TENDERS OPEN.

BUILDINGS.

Bootham—New Gymnasium Wing, &c., at Friends' Boys' School		W. H. Thorpe, F.R.I.B.A., Architect, 61, Albion-street, Leeds	Oct. 14
Winchcombe—Police Station	Gloucester Joint Committee	M. H. Medland, F.R.I.B.A., 15, Clarence-street, Gloucester	,, 14
Bradford—Eleven Shops in Manchester-road		Samuel Robinson, Architect, 15, Cheapside, Bradford	,, 14
Castleford—Catholic Presbytery in Pontefract-road	Rev. Father Hewison	Arthur Hartley, Architect, Carlton Chambers, Castleford	,, 14
Talybont—Farmhouse at Tynewydd Farm		E. Jenkin Williams, M.S.A., 31, High-street, Cardiff	,, 14
Yeovil—Repairs to Cottages in the Avenue	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	,, 14
Bristol—Parish Room, St. Anne, Greenbank		George H. Oatley, Architect, Bristol	,, 14
Banbury—Alterations to Cowhouses at Sewage Farm	Corporation	N. H. Dawson, C.E., Borough Surveyor, Town Hall, Banbury	,, 14
Watford—School (1,072), Judge-street and Ridge-street	School Board	W. H. Syme, F.R.I.B.A. 4, High-street, Watford	,, 14
Bootham—Science Block, &c., at Friends' Boys' School		W. H. Thorpe, F.R I.B.A., Architect, 61, Albion-street, Leeds	,, 14
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C E , Engineer, The Broadway, Wimbledon	,, 16
Bickington—Dwelling-House at Water	J. Honywill	S. Segar, F.I.A.S., Architect, Union-street, Newton Abbot	,, 16
Mellis—Additional Buildings to Schoolroom	Mellis Parochial School Managers	R. Stammers, White Lion Hotel, Mellis, Suffolk	,, 16
Stranorlar—Alterations in Infirmary of Workhouse	Guardians	Geo. M'Laughlin, Clerk, Poor-Law Office, Stranorlar	,, 16
Kingswood Hill—Engine-House at Pumping Station	West Gloucestershire Water Co.	E. D. Marten, M.I.C.E , The Birches, Codsall, Wolverhampton	,, 16
Beverley—Three Houses in Highgate	Minster Old Fund Trustees	Botterill, Son, and Bilson, Architects, 23, Parliament-street, Hull	,, 16
Rawmarsh—Brick Gasholder Tank	Urban District Council	E. O. Watson, Gasworks, Parkgate	,, 16
Morecambe—Two Residences, Victoria-esplanade	Brumfitt and Co.	Newton, Son, and Lawson, Archts., Euston-road, Morecambe	,, 16
Newry—Twenty-One Artisans' Dwelling-Houses	Urban District Council	Robert H. Doherty, Clerk, Town Hall, Newry, Ireland	,, 16
Taunton—Additions to Co-operative Society's Bakery	Committee of Management	F. W. Roberts, Architect, 2, Hammet-street, Taunton	,, 16
Barking—Six Classrooms to Gascoigne-road School	School Board	C. J. Dawson, F.R.I.B.A., Architect, East-street, Barking	,, 16
Wimbledon—Ten Workmen's Dwellings, Durnsford-road	Urban District Council	C. H. Cooper, M.I.C.E., Engineer, Broadway, Wimbledon	,, 16
Totnes—Cottage Hospital		Edward Richards, Architect, Manor Office, Torquay	,, 16
Kingsteignton—Dwelling-House at Sandy's Gate	William Raymont	Samuel Segar, Architect, Union-street, Newton Abbot	,, 16
Morecambe—Excavating, Bricklaying, and Concreting Works	Morecambe Tower Co.	W. H. and A. Sugden, Architects, Keighley	,, 16
Sedgley—Classroom, &c., Hurst Hill School	School Board	S. H. Eachus, Architect, North-street, Wolverhampton	,, 16
Birkenshaw—Six Scullery-Houses, Shirley-road	Industrial Society	The Society's Office, Birkenshaw	,, 16
Honor Oak, S.E.—Greenhouse at Cemetery, Forest Hill-road	Camberwell Vestry	W. Oxtoby, Engineer, Vestry Hall, Camberwell	,, 16
Wolverhampton—Reslating, &c , Market Hall	Markets Committee	J. W. Bradley, C.E., Borough Engineer, Town Hall, Wolverhampton	,, 16
Belfast—Completing the Workhouse Mortuary	Guardians	Young and Mackenzie, Engineers, &c., Donegall-sq., East Belfast	,, 17
Portsmouth—Premises in Stanley-street		J. D. Morant and Co., Limited, Palmerston-road, Southsea	,, 17
Thurles—Disinfecting-Chamber at Fever Hospital	Union Guardians	J. J. Coppinger, Clerk, Workhouse, Thurles, Ireland	,, 17
Robin Hill—Destructive Buildings, &c.	Oldham Corporation	S. A. Pickering, Borough Surveyor, Town Hall, Oldham	,, 17
Southwark, S.E.—Additions to Workhouse, Parish-street	St. Olaves Union Guardians	Newman and Newman, Architects, Tooley-street, S.E.	,, 17
Rotherham—Storerooms, &c.	Guardians	H. L. Tacon, Architect, 11, Westgate, Rotherham	,, 17
Hollinwood—Destructor Buildings, &c.	Oldham Corporation	S. A. Pickering, A.M.I.C.E., Boro' Surveyor, Town Hall, Oldham	,, 17
Alverstoke—Alterations to Workhouse	Guardians	H. F. A. Smith, Architect, Star Chambers, High-street, Gosport	,, 17
Isleworth—New Mortuary at Infirmary	Brentford Union Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 18
Banbury—Shop and Warehouse	Co-operative Society	The Society's Offices, Broad-street, Banbury	,, 18
North Shields—Padded Rooms at Workhouse	Tynemouth Union Guardians	Henry Gibson, Architect, Saville-streets, North Shields	,, 18
Burnley—Manufacturing Premises	Gas Committee	J. P. Leather, Gasworks, Burnley	,, 18
King's Lynn—Hospital & Administrative Block, Horsley's Chase	Sanitary Committee	H. J. Weaver, C.E., Town Hall, King's Lynn	,, 18
Brentford—Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 18
Westbury—Additions to Tinhead School	Edlington and East Coulston S.B.	W. W. Snailum, Architect, Church-street, Trowbridge	,, 18
St. Pancras, N.W.—Goods Office and Mess-Room	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	,, 19
Sheffield—Showrooms, Offices, &c., Savile-street	T. W. Ward	Edmund Winder, Jun., Architect, Wharf-street, Sheffield	,, 19
Great Horton—Three Through Houses, Horton Bank		Sam Spencer, Architect, 344, Great Horton-road, Bradford	,, 19
Nottingham—Hydraulic and Electric-Light Buildings	Midland Railway Co.	The Company's Architect, Cavendish House, Derby	,, 19
Edinburgh—Workshop at St. Bernard's Public School	School Board	Robert Wilson, Architect, 3, Queen-street, Edinburgh	,, 20
Lisnaskea—National School		Rev. John Coulter, Newtownbutler	,, 20
Beverley—Board-Room at Workhouse	Guardians	Botterill, Son, and Bilson, Architects, 23, Parliament-street, Hull	,, 20
Farnborough—Police Cottages		W. J. Taylor, County Surveyor, The Castle, Winchester	,, 21
Armagh—Post-Office		The Office of Public Works, Dublin	,, 21
Leamington—Free Library, School of Art, &c.	Corporation	J. Mitchell Bottomley, Architect, 13, Bond-street, Leeds	,, 23
Nottingham—Eighty-Six Cottages	Estates Committee	Arthur Brown, M.I.C.E., City Engineer, Guildhall, Nottingham	,, 23
Leeds—Clothing Factory, Wellington-street	R. B. Brown and Sons	Chorley, Connon, and Chorley, Architects, 15, Park-row, Leeds	,, 23
Bingley—Infants' School in Belgrave-road	School Board	Wm. Rhodes Nunns, Architect, Market-street, Bingley	,, 23
Romford—Isolation Wards, Administrative Block, &c.	Joint Hospital Board	W. Whitmore, Architect, 17, Duke-street, Chelmsford	,, 24
Manchester—Warehouses, &c., Rose-grove	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	,, 24
Dovercourt—Additions to Central Board Schools	Harwich School Board	Chas. E. Butcher, Architect, 3, Queen-street, Colchester	,, 25
Stoke-upon-Trent—Cottage Homes, &c.	Guardians	C. Lynam, Architect, Stoke-upon-Trent	,, 25
Ruabon—Alterations at Ponkey Board Schools	School Board	J. Morison and Son, Architects, King-street, Wrexham	,, 25
Canterbury—Asylum Buildings	Town Council	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	,, 26
Whitehall, S.W.—Foundations, &c., for New War Office	H.M. Commissioners of Works	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.	,, 27
Sandown—Higher Grade Board School	Brading School Board	James Newman, Architect, Thornton, Sandown	,, 31
Fletton Rural—Schools (600)	School Board	Wm. Boyer, Architect, 10A, Cowgate, Peterborough	,, 31
Myton-on-Swale—School		W. Ward, Myton Hall, Helperby	Nov. 1
Halifax—Primitive Methodist Chapel, St. Thomas-street		Medley Hall, Architect and Surveyor, 29, Northgate, Halifax	,, 2
Banff, N.B.—Coastguard Buildings	Admiralty	The Coastguard Station, Banff, N.B.	,, 3
Padstow—Coastguard Buildings	Admiralty	The Coastguard Station, Padstow	,, 3
Walthamstow—Blackhorse-road School (1,500)	School Board	W. Longmore, F.R.I.B.A., Bridge Chmbs., Hoe-st., Walthamstow	,, 7
Enfield—Alterations and Additions to Alma-road School	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	,, 7
West Brompton—Additions to Infirmary, Fulham-road	St. George's Union Guardians	E. T. Hall, F.R.I.B.A., Architect, 57, Moorgate-street, E.C.	,, 7
Cricklade—County Police-Station	Wilts Standing Joint Committee	Charles S. Adye, County Surveyor, County Offices, Trowbridge	,, 22
Billesley—Farmhouse		G. H. Hinton, Architect, 11, Church-street, Stratford-on-Avon	—
Little Lever—New Nob Inn	Chadwick's Walmersley Brewery Co.	D. Hardman, Architect, Silver-street, Bury	—
Brighouse—Rebuilding the Grove Inn, Elland-road		J. Lane Fox, Bond-street, Dewsbury	—
Stone—One Hundred Cottages	Co-operative Land Society, Ltd.	The Society's Offices, 14 and 16, Coleman-street, E.C.	—
Wyke—Stabling for the Red Lion Inn		J. Lane Fox, Architect, Bond-street, Dewsbury	—
North Shields—Rising Sun Inn	Tyne Improvement Commission	W. H. Knowles, F.S.A., 37, Grainger-street, Newcastle	—
Loughborough—Converting Dormitory into Ward		W. T. Hampton, F.S.I., Architect, Swan-street, Loughborough	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Isle of Walney—Two Hundred Workmen's Dwellings	Vicars, Sons, and Martin	The Isle of Walney Estates Co., Ltd., Walney	—
Poole—Two Cottages, Stable, Coach-House, &c.		F. Butler, Carriage Works, Poole	—
Northbourne—Repairs to Church		The Rector or Churchwardens, Northbourne, Deal	—
Stockton—Rebuilding 71, High-street	S. S. Eades	T. W. T. Richardson, Architect, 57, High-street, Stockton	—
Ashton-under-Lyne—Houses (17 to 40)		Samuel Lomas, 5, Stockport-road, Ashton-under-Lyne	—
Prestatyn—Villa		Burton & Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Barry—New Buildings off Park-crescent	W. J. Rogers, Ltd.	J. P. Jones, Richards, and Budgen, Archts, 18, St. Mary-st., Cardiff	—
Rawtenstall—House, Warehouse, and Stable at Holme Bank		John Taylor, 6, Ormerod-street, Rawtenstall, Lancs	—
Bexley Heath—Six Tenement Houses		Hawkins & Edgecombe, Architects, 22, Henrietta-st., Covent Garden	—
Lochmaddy—School and Teachers' House at Kylis Flodda	South Uist School Board	A. MacElfrish, Clerk, Lochmaddy	—
East Ham—Congregational Church		J. D. and S. J. Mould, Architects, 53, Queen Victoria-street, E.C.	—
Utley—Additions to the Roebuck Inn		John Judson and Moore, Architects, York Chambers, Keighley	—
Consett—Two Engine Houses	Iron Co., Ltd.	The Engineer's Office, Consett, Durham	—
Lulworth—Restoring Buttresses of East Lulworth Tower		The Rev. R. Usher, East Lulworth Vicarage, Wareham	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Leigh—Warehouse at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Wombwell—Chimney (40 yards) at Main Colliery		The Colliery Offices, Wombwell, Yorks	—
Leeds—Warehouse		W. Rusby, 25-27, Meadow-lane, Leeds	—

BUILDINGS—*continued.*

Buxton—Two Detached Villas	B. Waidle	Garlick and Flint, Architects, Terrace-road, Buxton	—
Ulverston—Bank, County-square		Settle and Farmer, Architects, Ulverston	—
Castleford—Six Houses, Ambler-street		Garside and Pennington, Architects, Central Chambers, Castleford	—
Warsaw—Freezing-Chambers, &c., in Market Halls	Municipality	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	—
Great Yarmouth—Engineer's Shops, Foundry, and Stores		Crabtree and Co., Engineers, Great Yarmouth	—
Preesall—House		John Lawrenson, 41, London-street, Fleetwood	—
Leeds—Frame Schoolhouse, Cardigan-road	St. Margaret's Church Trustees	Corson and Jones, Architects, 25, Cook-street, Leeds	—
Shipley—Club Premises		John Jackson, M.S.A., Architect, Barry-street, Bradford	—
Rothbury—Houses		Thomas Muckle, Rothbury	—
Carlisle—Converting 30, Lowther-street, into Business Premises	Clark Bros. and Co.	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	—
Ilford—Congregational Church		J. D. and S. J. Mould, Architects, 52, Queen Victoria-street, E.C.	—
Broughton-in-Furness—Washhouses and W.C.'s at Cinder Hill		John Clark, Solicitor, Broughton	—
Leeds—Business Premises and Manager's House, Claypit-lane	Henry Clarkson	Butler, Wilson, and Oglesby, Architects, 12, East Parade, Leeds	—
Richmond—Fifty Houses		J. Pennington, F.A.I., Surveyor, Richmond	—
Abergavenny—Additions to National Schools, Hereford-road		E. A. Johnson, F.R.I.B.A., Abergavenny	—
Gorton—Extensions to Stables	Urban District Council	The Council Office, Hyde-road, Gorton	—
Tottenham—Six-Roomed Houses in Bruce-grove		S. Ford, A.R.I.B.A., F.S.I., Archt., 3, South-sq., Gray's Inn, W.C.	—
Ballyclare—Rebuilding Dye-House, &c.		The Whitepark Finishing Company, Ballyclare	—
Radyr—Wesleyan Chapel	Chapel Trustees	J. P. Jones, Richards, and Budgen, Archts., St. Mary-street, Cardiff	—
Easington—Cottages		The Easington Coal Company, Limited, Sunderland	—
Clowne—Sixty Houses		Frank Cook, Architect, 22, Leeming-street, Mansfield	—
Stafford—Alteration to Premises in Lichfield-road	Laundry Co.	J. Goodchild, Hazeldene, Stafford	—
Bradford—Alteration to Premises, All Saints'-road		G. C. Ross, Architect, Morley-street, Bradford	—
Morecambe—Concert Hall, West End Market		H. Howarth, Architect, 7, Regent-road, Morecambe, W.	—
Barrow—Alterations to Albion Hotel	Henry Spencer and Co.	E. M. Young, Architect, 90, Duke-street, Barrow	—
Earl's Barton—Games Rooms, &c., at Institute		Mosley & Anderson, Architects, Fish-st., Northampton	

ENGINEERING.

Milford—Sinking Well and Erecting Pump at Carrowkeel	Rural District Council	S. Watters, Clerk, The Workhouse, Milford, Ireland	Oct. 14
Tiflis—Tramways	Town Council	The Managing Dept., Town Council, Tiflis, Transcaucasus	,, 14
Chard—New C.I. Tanks, and Water Arrangements at Brewery	Mitchell, Toms, and Co., Ltd.	Arthur W. Yeomans, Architect, Chard	,, 14
Warrington—Two Sets of Steam-Engines	Corporation	James Deas, C.E., M.I.M.E., Bank House, Warrington	,, 14
Farnham—Additions to Tank, &c., at the Gasworks	Gas Co.	G. McDonald, 104, West-street, Farnham	,, 14
Guildford—Bacteria Beds	Town Council	C. G. Mason, C.E., Borough Surveyor, Tuns-gate, Guildford	,, 16
Bilston—Water-Main	Urban District Council	C. L. N. Wilson, Surveyor, Town Hall, Bilston	,, 16
Aberdeen—Water and Sewerage Works	District Committee	John D. Watson, County Engineer, County Buildings, Aberdeen	,, 16
Seisdon—Steam-Roller	Rural District Council	E. W. Cozens-Hardy, Penn Fields, Wolverhampton	,, 16
Rochford—Well on Site of Isolation Hospital	Rural District Council	C. Pertwee, Architect, Chelmsford	,, 16
Great Torrington—Waterworks	Corporation	Baldwin Latham, M.I.C.E., 13, Victoria-street, S.W.	,, 16
Keighley—Bridge at Queen's-road	Corporation	W. H. Hopkinson, A.M.I.C.E., Borough Engineer, Keighley	,, 17
Southowram—Sinking Two Stone Shafts at Law Farm		R. Berry, Mineral Surv., Arcade Chmbrs., Commercial-st., Halifax	,, 17
Doneraile—Waterworks	Rural District Council	Maurice Regan, Clerk, Mallow	,, 17
Kirby Misperton—Widening Stone Bridge		Walker Stead, M.I.C.E., County Surveyor, Northallerton	,, 17
Poplar, E.—Lancashire Boilers, Water-Pressure Drums & Tanks	Guardians	F. J. Warden Stevens, Connaught Mansions, 34, Victoria-st., S.W.	,, 18
Purton—Waterworks	Cricklade & Wootton Bassett R.D.C.	F. Redman, Engineer, Newport-street, Swindon	,, 18
Blackpool—Spen Dyke Brick Barrel	Corporation	J. Wolstenholme, C.E., Boro' Eng., Market Buildings, Blackpool	,, 18
Leeds—Fifty Electric Tramcars	City Council	Thomas Hewson, M.I.C.E., City Eng., Muncipal Buildings, Leeds	,, 18
Plumstead—Two Willacy's Sanding Machines	Vestry	Edwin Hughes, Vestry Clerk, Vestry Hall, Maxey-road, Plumstead	,, 18
Poplar, E.—Steam-Jet Plant and Auxiliary Pumping Plant	Guardians	F. J. Warden Stevens, Connaught Mansions, 34, Victoria-st., S.W.	,, 19
Innellan—Extension of Pier		D. and C. Stevenson, Civil Engineers, 84, George-street, Edinburgh	,, 19
Hampstead, N.W.—Two Boilers at Public Baths, Finchley-road	Vestry of St. John	The Surveyor, Vestry Hall, Hampstead	,, 19
Middlesbrough—Steel Ring Web Girder		David Terrace, Manager, Corporation Gasworks, Middlesbrough	,, 20
Oxton—Waterworks		Robert Patterson, C.E., 3, Williams Bank, Earlston	,, 21
Luton—Electric Lighting Plant	Town Council	Albion T. Snell, Engineer, Suffolk House, Cannon-street, E.C.	,, 22
Swinton—Sinking Well	Urban District Council	R. Fowler, C.E., Engineer, Swinton, near Rotherham	,, 24
Hastings—Service Reservoir and Filter-House, West Hill	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	,, 24
Gloucester—Refuse Destructor, &c.	Electricity Supply Committee	Richard Read, A.M.I.C.E., City Surveyor, Gloucester	,, 24
Barking—Light Railway Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen-street-place, London, E.C.	,, 24
Llanelly—Locomotives, Weighbridges, and Turntables	Navigation Commissioners	Colin P. Fowler, A.M.I.C.E., Harbour Office, Llanelly	,, 25
Wigan—Electric-Lighting Plant	Corporation	H. Collings Bishop, Borough Electrical Engineer, Wigan	,, [illegible]
Islington, N.—Secondary Battery	Vestry of St. Mary	The Electrical Engineer, 50, Eden-grove, Holloway, London, N.	,, 25
Stonehaven—Harbour Extension	Harbour Trustees	Jas. Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen	,, [illegible]
Port Elizabeth to Humansdorp, Capetown—Railway (70 miles)		The General Manager of Railways, Capetown	,, 30
Aylesbury—Machinery at Sewage Disposal Works	Urban District Council	J. H. Bradford, Surveyor, 2, Rickford's Hill, Aylesbury	,, 31
Chipping Campden—Waterworks	Rural District Council	Nicholson Lailey, A.M.I.C.E., 16, George-street, Westminster	,, 31
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	Nov. 3
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Colonial Secretary, Colombo	Jan. 4
Ilford—Portable Steel Crane (3-ton)	Gas Co.	The Engineer's Office, Gasworks, Ilford	—
Uddington—Electric Lighting Plant		J. Watson, Builder, Uddinston, Scotland	—
Stepney—Cooking and Heating Apparatus, Ratcliffe Workhouse	Guardians	R. Banks Martin, Architect, 103, Plashet-grove, East Ham	—
Chetwynd Aston—Waterworks	Newport Rural District Council	W. Wyatt, Engineer, Bryndwr, All Saints, Shrewsbury	—

FENCING AND WALLS.

Shincliffe—Fencing (190 yards)	Parish Council	R. Smith, Overseer, Shincliffe Village	Oct. 14
Morthoe—Fencing and Laying-out Burial Ground	Parish Council	E. Henshall, A.M.I.C.E., Woolacombe, North Devon	,, 16
Stafford—Pine Wood Fencing (1,100 yards) and Gates	Committee of Management	G. H. Smallman, Treasurer, 29, Gaolgate-street, Stafford	,, 17
Cranleigh—Fencing and Laying-out Burial Ground	Parish Council	Edward L. Lunn, Surveyor, 36, High-street, Guildford	,, 17
York—Wrought-Iron Fencing at Workhouse	Guardians	Penty and Penty, Architects, Lendal Chambers, York	,, 18
Gransha, Co. Derry—Galvanised Iron Fence	Asylum Committee	M. A. Robinson, C.E., M.R.I.A.I., Richmond-street, Londonderry.	,, 19
Salford—Retaining Wall, Strawberry-road	Corporation	John Holt, C.E., 6, St. Mary's Gate, Manchester	,, 20
London, W.—Fencing Materials	Great Western Railway Co.	The Stores Superintendent's Office, Swindon	,, 23

FURNITURE AND FITTINGS.

Ayr—Twenty-Three Dual Desks in Oak	School Board	Quint. Blane, Deputy Clerk, National Bank, Ayr	Oct. 14
Lancaster—Bedsteads, &c., for Lodging-House, Marton-street.	Corporation	The Borough Surveyor's Office, Market-square, Lancaster	,, 14
North Berwick—Furnishings to Infectious Diseases Hospital		A. D. Wallace, Town Clerk, North Berwick	,, 14
Sligo—Sixty Windsor Chairs	Corporation	The Town Clerk's Office, Town Hall, Sligo	,, 18
London, E.—Renovating Furniture in Vestry Hall	St. George-in-the-East Vestry	The Surveyor, Vestry Hall, Cable-street, London, E.	,, 19

PAINTING.

Wrexham—General Market, Henblas-street		The Borough Surveyor, Wrexham	Oct. 16
Heaton Norris—Two Recreation Grounds	Urban District Council	Jno. Green Banks, Clerk, 79, Heaton Moor-road	,, 16
Wolverhampton—Market Hall	Markets Committee	J. W. Bradley, A.M.I.C.E., Boro' Eng., Town Hall, Wolverhampton	,, 16
Rochester—Guildhall and Municipal Offices, Technical Institute, Police Station, and Corn Exchange	Corporation	W. Banks, A.M.I.C.E., City Surveyor, Guildhall, Rochester	,, 18
London, N.E.—Interior Workhouse Dining Hall, Kingsland-rd.	St. Leonard Guardians	J. Smith, F.R.I.B.A., Parliament Mansions, Victoria-street, S.W.	,, 18
Lindfield—Exterior of Board Schools	School Board	Edward Waugh, Clerk, Haywards Heath	,, 18
Carlisle—Police Stations at Bowness-on-Solway, Wigton, Longtown, Whitehaven, Silloth, and Earl-street		Geo. Dale Oliver, County Architect, Carlisle	,, 20
Winchester—Workhouse	Guardians	Cancellor and Hill, 12, Jewry-street, Winchester	,, 20

PLUMBING AND GLAZING.

Belfast—Plumbing Works for Public Buildings		The Office of Public Works, Dublin	Oct. 16

ROADS AND STREETS.

Barry—Street Improvement Works	Urban District Council	J. C. Pardoe, A.M.I.C.E., Surveyor, Holton-road, Barry	Oct. 16
Wimbledon—Making-up Cecil-road and Balfour-road	Urban District Council	The Surveyor's Office, The Broadway, Wimbledon	,, 16
Blackburn—Street Works	Highway Committee	W. Stubbs, A.M.I.C.E., Boro' Eng., Municipal Offices, Blackburn	,, 16
Swindon—Works to Private Back Roads	Swindon New Town U.D.C.	H. J. Hamp, Surveyor, Regent-circus, Swindon	,, 16
Guildford—Paving Approach to Pannell's-terrace	Town Council	C. G. Mason, C.E., Borough Surveyor, Tuns-gate, Guildford	,, 16
Chiswick, W.—Paved Footpath	Urban District Council	Arthur Ramsden, Surveyor, Vestry Hall, Chiswick	,, 18
Woodhall Spa—Road Works	Urban District Council	Brocklesby Crookes, Surveyor, Woodhall Spa	,, 18
Balby-with-Hexthorpe—Forming and Sewering Back Streets	Urban District Council	G. Gledhill, Surveyor, High-road, Balby	,, 18
Selly Oak—Street Works	King's Norton & Northfield U.D.C.	A. W. Cross, A.M.I.C.E., 23, Valentine-road, King's Heath	,, 18
Watford—Road Works	Urban District Council	The Engineer's Office, 14, High-street, Watford	,, 18
Gillingham—Paving	Urban District Council	F. C. Broacher, Clerk, New Brompton	,, 19
Grimsby—Road Formation and Drainage Works	G. S. Stephenson	William Waller, 243, Freeman-street, Grimsby	,, 21
Finchley, N.—Repairs to Roads at St. Pancras Cemetery	St. Pancras Vestry	C. H. F. Barrett, Vestry Clerk, Vestry Hall, Pancras-road, N.W.	,, 23
Dover—Australian Hardwood Paving, Granite Kerb, &c.	Town Council	Henry E. Stilgoe, A.M.I.C.E., Boro' Eng., Town Hall, Dover	,, 24
Withington—Street Works	Urban District Council	A. H. Mountain, A.M.I.C.E., Surveyor, Town Hall, Withington	,, 26
Silloth, Cumberland—Flagging, &c.	Holme Cultram U.D.C.	George Armstrong, Architect, 24, Bank-street, Carlisle	,, 31
Armley—Flagging Sixteen Houses near Carr Crofts		B. Anderson, Prospect House, Littlemoor-road, Pudsey	—
London, E.C.—Concreting (1,700 yards)		P. K., c/o Street and Co., 30, Cornhill, E.C.	—

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SUPERFICIAL ART.

WHETHER it is better to "decorate construction" or to "construct decoration" is a question to be answered by those who have been reared in the earlier decades of this century. We have somewhat advanced beyond this conception of architecture. We recognise no decoration that is worthy of the name that does not arise out of construction as the basis, so that either of the above ways of putting the case is misleading as making decoration something separated and distinguishable from construction; and yet we suppose there are a large number of architects who are ready to accept the above dictum, and to apply their decoration to their buildings. It is an easy and expeditious mode of making architecture; one that falls in wonderfully well with our facilities of execution and manufactured materials of decoration, and also one which the public or the average man and woman can appreciate, who like to pay for something tangible, for so much of "art decoration" or so little of it as they think fit. They look upon it as something that can be applied to any building in quantity great or small, and therefore it has a money price. This view of architecture lends itself to commercial considerations and to the superficial. Buildings can be covered with plain or costly garments; they can be decorated more or less according to the amount of money to be expended, quite irrespective of their design or construction. No doubt such an interpretation of architecture has been in vogue ever since the Revival, and architects still cling to it as being the popular one, and it has also been extended to the various allied arts. Carving, metalwork, stained-glass, keramic decoration, furniture have all suffered more or less by this idea of applying ornament to objects of use, for they have all been taken to mean something superficial that can be applied to buildings and furniture. Arising out of this notion is another quite as objectionable: that the decoration can be in any style. The makers of fashionable furniture, plastic decoration, and metalwork manufacture the same articles in various styles. They rejoice in the appellation of "Renaissance," "Louis Seize," "The Empire," "Gothic," "Stuart," "Japanese," &c.—a practice that has done more to degrade so-called art than anything else; but there is no differentiation for differing uses. For how can the same ornament be used for a shop that is used in a town-hall, or applied to a door-hinge that is used on a coal-scuttle? We can understand the principles of ornamentation that underlie the different styles being applied, but not the ornament itself.

Our modern architecture—especially of the commercial kind—is a realisation of this confused thought; it fairly interprets the idea that "art" and any given style can be applied to the most commonplace building just as we can decorate a cake in any style with sugar and confectionery. Apply a certain form of feature, or ornament, to a building, and it is henceforth made Renaissance, or Gothic, or "Queen Anne." The application can all be arranged after the plan has been prepared or in the elevation. It does not matter one iota whether the plan has been devised to give prominence to certain features, or the parts be dictated by any motive; it is sufficient to put a break here, a bay window or turret there, and the design is henceforth Gothic.

The art exhibitions that were opened last week represent the new life and impulse that has been given to those departments of art, one relating chiefly to domestic and home life, and the other to church work. The Arts and Crafts Exhibition illustrates practical examples of design and workmanship;—how consistency and honesty of purpose can be made the basis of all art effort. In it we see those valuable principles initiated and promulgated by such men as William Morris in various departments of industrial labour, who was one of the first to remove the trammels of labour, and make it subserve the highest ends of the individual workman. The Church Congress exhibition of Ecclesiastical Art also was interesting as illustrating an improved type of metalwork, stained glass, and embroidery, and the Clergy and Artists' Association, to which we referred last week, shows a remarkable advance in church decoration and metalwork, under the leadership of our best architects and craftsmen—all in their way directed to overcome the baneful influences of custom, and the superficial treatment of art as applied to our buildings.

The superficiality of which we speak is noticed largely in our commercial buildings, our shops, and dwelling-houses. It is manifested in three particulars:—(1) Defective plan, (2) thinness of detail, and (3) poor fittings. In each of these the architect appears to do his work hurriedly. If there are two or more possible ways of doing a thing, the easiest and most direct is taken. The "short-cut" is the watchword of the commercial architect. The position of a doorway is a small matter to thousands of people; but it may make all the difference in the world to the man who occupies a set of offices, or a house, if he has to walk a few feet further than necessary in his passage from one office or room to another every day; or his comfort and freedom from draughty currents of cold air may be secured if a door is placed a few feet or inches further one way or another. But the superficial and hurried planner of buildings takes no trouble about such matters: he places his doorways as they are planned in thousands of houses;—they are placed in line —it is easier to draw the plan so—regardless of the comfort of the tenants or occupants. Several hundreds of houses have to be built, and if the plans can be multiplied from the same design, the better it is for the builder. Windows are planned on the same principle: they are placed where they look best, and one over the other; light and ventilation are questions that do not trouble the designer, so the evil of having a window in the wrong place at one corner of the room is repeated. So with the size and proportion of rooms—matters which very few people consider;—that which divides the easiest is adopted, and hundreds of people have to endure a small badly-shaped room in which they can hardly get round the table comfortably, or derive any warmth from the fire in winter. Take, again, the staircase. How many houses have convenient stairs or entrances? It is the superficial designer that is to blame, for he likes a straight flight starting from the entrance, and a straight flight down the cellar and over to every story. Yet everyone knows now this is the worst arrangement, the most dangerous, and the most uncomfortable. But it is simplest and cheapest; the labour is less in this form, and the cost is therefore less. Then there is what may be called the "cooked" staircase—two or more flights squeezed into a space that is inadequate—very tiring to ascend, and dangerous to come down; it is a kind of "dog-legged" arrangement, only with the second flight at right angles to the first, which latter consists of only a few steps; it has a dangerously high rise and small tread, and often has winders. This plan is often seen in small villas; it involves the necessity of hoisting up all the large and heavier pieces of furniture through the windows, and taking out the sashes for wardrobes and pianos. To turn the corners of such a staircase with a large sideboard or bookcase would be impossible without injury to the walls or furniture. A few more inches in width, and a foot or two more in length of "going" as it is technically termed, would have made an easy and effective arrangement. Questions about the position of furniture, sideboards, bookcases, wardrobes, pianofortes, and even chairs, of fireplaces, of wall-space for hanging pictures, &c., seldom enter the head of the speculative architect.

The details of the buildings of this class are meagre and thin. Cornices, the mouldings round doors and windows, panelling are all characterised by this quality of thinness; there is a want of solidity in them. The designer has only thought of putting all on his surfaces in the least expensive form: "bracketing out" cornices entails labour; mouldings worked out of the solid are out of the question when mouldings can be so readily "planted" on. The old woodwork was solid; the mouldings formed part of the substance of the wood. The tie-beams and rafters of old church roofs have often mouldings worked along the edges, but we do not work so now; the tie-beam is simply chamfered or beaded. We represent a beam formed of grooved and tongued boards fixed to brackets, with machine run mouldings nailed along the edge. Our framed partitions and panelled woodwork are turned out by the machine. We cannot mistake them by the side of an old piece of panelling or wainscoting: the one is an example of the superficial mode of working, the other is hand-wrought and solid, the mouldings forming part of the framing. Machine-made mouldings are now "planted" on, a stock capping put along the top. We know the flimsy character of ordinary framed woodwork, especially when machine-made mouldings are used. It is a relief to the eye to see a plain bold quarter-round and fillet round our panels or architraves, or a bold ovolo in a cornice, instead of the everlasting quirked moulding of the mills.

Applied ornament is largely used in plaster work. It can be applied easily to large surfaces, to the enrichment of cornices, friezes, panels, and the like, and there is a fatal tendency to put it on thick. The plasterer can defy ordinary structural lines and rules, and the nature of his material allows him to exceed the limits which other tradesmen have to keep. The decorative fabrics in the market encourage the superficialist, because he can apply them lavishly and at comparatively little cost. A dado can be covered with elaborate relief ornament that would have cost in carved wood or plaster a prohibitive sum; a ceiling can be covered with an intricate pattern in "Anaglypta," or in any of the new fibrous plasters, that would have defied our best plasterers and modellers early in the present century; columns and square piers are lined with Lincrusta or some embossed material, leaving hardly a square yard of plain surface anywhere. We are speaking now of some of our recently-built restaurant interiors, or theatre lounges and vestibules. It is all applied ornament, good or bad in design, but so profuse and unintermittent that there is no relief for the eye. Perhaps we see an intricate-patterned ceiling bagging down here and there, as if in wilful satire, showing at once what the decoration is; or we see a flat abacus sprawling upon the rich pattern of the ceiling without the slightest reference to the ornament which has been cut round it. These are some of the vagaries of the lavish use of applied decoration. In the iron and metal finishings of our houses, articles like stoves, locks, and door furniture, the superficial is also rampant. Manufacturers vie with one another in producing these articles with the most prolific display of cast ornament. It is a matter only of first expense in the pattern. Can we honestly say these florid cast-iron grates are as substantial as they should be? And is not this plethora of ornament tiresome and obtrusive in our fireplaces, where we look for quietness and rest? So at least many think, and we can refer our sympathising readers to the present Arts and Crafts Exhibition now open in Regent-street, where that useful and important feature of our homes may be seen treated in not only a sensible method, but in a manner at once decorative and restful. We do not say that these models are all that can be desired; in one or two examples of fireplace treatment these merits have been a little exaggerated, and the desire for quaintness has exceeded the motives for honesty. But we take them as a healthful indication of better things—an attempt to bring our homely arts to the tribunal of common sense.

* * *

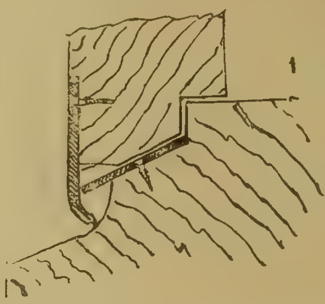
ESTIMATES.—XXVI.

IRONMONGERY—GENERAL FITTINGS.

For certain special goods, provisional prices or p.c. should be stated. It prevents many errors in estimating doubtful fittings or those of a special or patented class. Take, for instance, casement fastenings or espagnolette bolts. There are several patents, some of which we have priced, for which a quotation should be obtained. Fanlight and skylight openers are also numerous, and a sum should be stated. The patents known as Leggott's, Beanland's, Cartland's "Imperial," &c., are used. The first named has a good reputation, and ranges in price from about 3s. 6d. in iron to 7s. 6d. in gunmetal for small skylights (see manufacturers' lists). Hill and Co.'s patent fanlight openers are suitable for lights hung any way, and are made with rod action and with brass screws, or with cord, and lock the lights in any desired position. For fanlights (inward opening) the price ranges for iron fittings from 7s. 6d. with 15in. length of screw; for 2ft. light, 10s. 6d.; in brass the price is nearly half again as much; for the skylight openers, the cost for 15in. length of screw or light is 12s. 6d. iron and 17s. 6d. brass, and for 24in. light 17s. 6d. in iron and 23s. 6d. in brass. These prices are for ⅝in. brass screws. A ¾in. or 1in. screw would cost more.

It is usual to place such things as rainwater goods, stoves, and ranges under the "Founder," notwithstanding these fittings are supplied often by the wholesale ironmonger. In a strict sense, the ironmonger's bill is a collection of numbered items such as those we have given, while the founder and smith deal with cast and wrought ironwork of a larger kind, such as stoves, rainwater pipes and guttering, iron casements; also the ironwork required in carpentry, such as king and queen heads, bolts and screws, stirrups, straps, heads and nuts, gibs and cotters, &c., the smith's work being all of wrought iron.

Under the present heading we deal chiefly with those castings, such as rainwater goods, stoves, &c., which are required in ordinary buildings. These things are taken at per foot or yard run, or are weighted out like girders, columns, stanchions, including in the price cost of preparing patterns, &c. For fittings like rainwater pipes, heads and shoes, it is desirable to describe them according to pattern in a manufacturer's catalogue, or state a p.c. value. The same remark applies to stoves and ranges. It is better to provide No. — stoves at the p.c. value of ———, to be approved by the architect, or supplied by a firm to be approved. The trade discount is 20 to 25 per cent. Rainwater goods come under the founder, and are billed at per foot run for pipes and guttering, but are measured by the yard. Angles, bends, heads, &c., are numbered. As the cost of iron fluctuates, the prices of moulded and plain guttering should be obtained from manufacturers such as Macfarlane and Co., Glasgow, as they vary much according to size, weight, section, &c. R.W. pipes are made in 6ft. and 3ft. lengths, and guttering in 6ft., 4ft., and 3ft. lengths. Iron casements are of various qualities, and such firms as the Crittall Manufacturing Co., Ltd., Braintree; and Burt and Potts, Westminster, make very superior casements in iron, steel, bronze, &c.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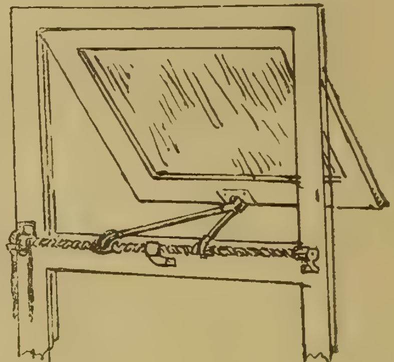

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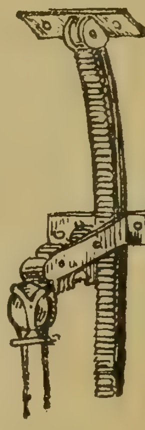

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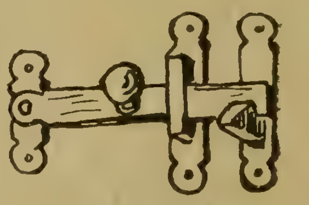

Our sketches last week represented a few of the articles priced. Sketches 1 to 4 illustrated a few casement fasteners. No. 1 is a cockspur fastener of malleable iron, priced in one catalogue at 12s. per dozen. No. 2, with square arm 4in. in brass, is 26s. per dozen. No. 3, hinged to suit either hand, 4in., is 24s. per dozen. No. 4, of brass, polished, is 3s. 6d.

The accompanying sketches explain themselves. No. 1 is a simple metal water bar, consisting of two plates of brass, the vertical on lower rail of casement, forming a check when engaged with the sill-plate. The price is 3s. per foot (see Hill's catalogue). No. 2 is the same firm's fanlight opener as applied to a fanlight opening outwards. The price for 18in. opening in iron is 9s., for brass 14s. No. 3 illustrates an adjustment (Leggott's system) for opening and closing skylights, the best in the market. The form shown is called the "New Silens." Price 4s. 10½d. in malleable iron, and 7s. 6d. in brass for 10in. opening.

CASEMENT AND SKYLIGHT FASTENINGS, ETC.

No. 6. Strong brass casement fasteners.

See previous items. A strong, common kind may be priced at 1s. to 2s., and fixing and screws, say, 4½d., say 1s. 6d. altogether.

No. 2. 87in. brass espagnolette fastenings for casements, say—

	£	s.	d.
Cost of bolt	1	15	0
Screws and labour fixing	0	3	6
	1	18	6

This price would include profit. (See other previous items.)

No. 4. Wrought-iron quadrants, brass pulleys, lines, and pins for opening skylights, complete.

Here a p.c. sum should be stated, as these vary. We have priced an item of this kind before. Several patented skylight openers are in the market as Leggott's, "Silens," made of malleable iron, bronzed iron, brass, and gunmetal, and the prices of any of these can be ascertained of any large maker or ironmongers. The following is a calculation for an ordinary kind to open 10in. Cost of quadrant, cogged with screw-action, as in Leggott's system.

	£	s.	d.
Malleable iron opener	0	3	9
Screws	0	0	2
8 yards line	0	0	4
Fixing, say, 2½ hours, at 10d., say	0	2	0
Including profit	0	6	3

Brass would be half again as much.

Gunmetal, polished, the price is about double that of malleable iron.

Common iron quadrant openers and fixing may be calculated as follows:—

	£	s.	d.
Cost of quadrant	0	1	6
Two pulleys	0	0	10
Brass eye, say	0	0	1
Brass cleat hook for cord	0	0	6
8 yards of line, say	0	1	0
Screws and fixing	0	2	0
	0	5	11

Including profit, say, 6s.

The above prices are for small skylights opening about 10in. to 15in. For large skylights, say 6ft. by 4ft., which open about 18in., the prices given above would be more—for malleable iron about 7s. to 12s. each, and for gunmetal double.

No. 1. Improved "Silens" (Leggott's) skylight opener, made of brass.

These do not require a pulley, and the cord hangs straight down. (See sketch 3.)

	£	s.	d.
Cost of "Silens" (brass) for 10in. opening	0	7	6
Screws and fixing, say	0	2	0
Cord (14ft.)	0	1	0
Cost, including profit	0	10	6

For larger skylights, say 5ft. by 3ft, a gunmetal opener would cost about 24s. on this system.

Allow 30ft. of endless cord for skylights.

This cord is made double, and 30ft. of cord would be 15ft. long, and the price would be about 1s. 3d.

No. 6. Double brass pulleys.

These would cost about 2s. 6d. each.

No. 4. Brozned iron fanlight openers for lights opening inwards, 12in.

These consist of hinged quadrants, cogged and actuated by cord over pulley.

	£	s.	d.
Cost of bronzed iron	0	1	6
Cord (12ft.)	0	0	7½
Screws and fixing	0	1	6
Cleat	0	0	6
Including profit	0	4	1½

Brass openers cost about 5s. each.

No. 2. Stout iron openers for lantern lights to open 15in.

These would be quadrants to work with stick or cord, and may be put down as follows:—

	£	s.	d.
Cost of opener, each	0	1	3
Two pulleys, say	0	2	6
Cord	0	1	0
Fixing, &c.	0	2	0
Including profit	0	6	9

No. 12. Brass sash lifts and fixing.

Price from 10d. to 1s. 6d. each, and add for screws and fixing 6d.—say 1s. 6d. each. These lifts should be let in flush with sash-rail.

Two dozen brass dresser hooks 1¼in.

These are sold by the dozen, from 1s. to 2s.

	£	s.	d.
Say 2 dozen brass hooks at 1s. 6d.	0	3	0
Fixing and screws at 1s. per dozen	0	2	0
Cost of 2 dozen	0	5	0

No. 4. Leggott's patent "Silens" skylight openers for skylights, 4ft. by 6ft., of malleable iron. (See sketch 3.)

The quoted price for No. 7, suitable for skylights, 4ft. by 3ft., is 9s. For these longer lights, say 12s., fixing screws, &c., 3s. In gunmetal the cost is 22s. each. Obtain price from maker.

No. 2. Leggott's patent fanlight opener, iron and gunmetal.

The particulars are not given; to obtain a correct estimate consult maker's list.

The price in one list for single fanlight is 25s.; for a range of lights it would be rather less in proportion.

Provide and fix Messenger and Co.'s (Loughborough) sets of apparatus for opening and closing windows, and ventilating tackle, 24ft. long.

Consult list of prices. Laxton gives for sets of tackle, 24ft. long, £2 4s. 6d. Each set includes one spring lever connecting-rod, one knuckle-lever to each 4ft. light, one carrier to each muntin or rafter, one strong lever and horizontal rod.

DOOR-HANDLES AND LATCHES.

No. 18. 9in. brass door-handles, to be approved by architect.

How is this item to be priced? Brass door-handles are of all sizes and shapes, and may cost from 18s. per dozen to 20s. or more per pair. We may put these down at 4s. 6d. per pair, if plain, and add for screws and fixing 4d., including profit.

No. 6. Pair 12in. brass grip door-handles, p.c. 16s. per pair, and fixing.

	£	s.	d.
Brass handles, per pair	0	16	0
Fixing	0	1	6
	0	17	6
Profit	0	1	9
Per pair	0	19	3

No. 4. Brass door-latch furniture, 9in.

Good brass grip handles would run from 2s. 6d. each to 4s. 6d. for plain designs.

No. 4. Japanned Norfolk latches of strong quality, 8in. plates, and fixing.

These may be priced at 8½d. each, or 6s. 6d. per dozen.

No. 2. Best Suffolk iron japanned latches, 9in. long.

These would cost about 9d. to 1s. each. Fixing 3d., say 1s. 3d., including profit.

No. 2. Best iron Gothic thumb latches, 9in. long, according to sketch (4).

A malleable iron latch of this description will cost about 1s. 9d. to 2s. each.

No. 2. Pair Gothic hinge fronts of malleable iron, according to design (21in. by 8in.)

A price can only be fixed by referring to the design. For hinge fronts of this size and of simple design, the cost would be about 5s. to 9s. per pair. In most illustrated catalogues designs and prices are given. (See Young and Marten's list.) If the architect's design is to be worked to, the cost would be much more.

CAST IRON.—RAINWATER PIPES, ETC.

150ft. run. 4in. half-round eaves-guttering, and wrought-iron brackets screwed to feet of rafters.

Laxton prices 4in. half-round guttering at 8d. per yard, and o.g. gutters at 10d. per yard. Say—

	£	s.	d.
Cost of guttering per foot	0	0	3
Brackets, bolts, and screws, red-lead, &c., per foot	0	0	1½
Fixing per foot, say	0	0	2
Per foot	0	0	6½

Some estimators allow 2d. per foot up to 4in. for fixing r.w. pipes and gutters, and 3d. per foot above 4in. Half-round gutters weigh 6lb. per yard, or 2lb. per foot for 4in. gutters, and for o.g. 7lb. for 4in. gutters.

50ft. run. 4½in. by 3in. moulded eaves guttering, jointed and bolted in red-lead cement, and fixed with screws.

The price will depend on the section. Moulded gutters of this size are quoted at 9d. per foot delivered on works.

	£	s.	d.
Say, cost per foot delivered	0	0	8
Brackets, 9d. each, 6ft. apart	0	0	1½
Fixing, including fitting bolts, &c., say	0	0	3½
Per foot	0	1	1

If in any great length.

26ft. run. Ditto 5in. by 4½in.

This is priced at 1s. 1d. per foot, fixing 3½d., say 1s. 4½d. per foot. This is the price given in W. Macfarlane and Co.'s catalogue.

No. 4. Angles to 4in. guttering.

These are priced about 10d. each.

No. 4. Nozzle pieces.

Price same at 10d. each.

No. 2. Angles to 4½in. by 3in. moulded eaves-guttering.

These may be priced at 1s. extra. An angle includes 1ft. length each way, which have to be deducted from cost of casting the angle.

No. 2. Outlets to ditto.

These would cost about 1s. 6d. each, including fixing and bolts.

No. 4. Stopped ends to ditto.

Cost about 4d. each. Fixing with red-lead, bolts, &c., about 3d. more, say 7d.

90ft. run. MacFarlane's (Glasgow) 4½in. by 3¼in. No. — eaves gutter, bolted and jointed, with red-lead cement, and fixed with screws to fascia.

For price, quote number in catalogue.

	£	s.	d.
Say, per foot	0	0	9½
Fixing, including fitting bolts, &c.	0	0	3½
Iron brackets fixed to fascia 6ft. apart.	0	0	1
Per foot	0	1	2

No. 3. Angles.

Say 1s. 6d. each.

No. 1. Outlet.

Price this at 1s. 6d.

AN AMENDED IMPROVEMENT SCHEME FOR WESTMINSTER.

IN July last, on the recommendation of its Improvements Committee, the London County Council decided, subject to being relieved from widening Abingdon-street and to a contribution of £100,000 from the local authority, to apply to Parliament in the ensuing Session for powers to embank the Thames from Victoria Tower-garden to Lambeth Bridge; to widen Millbank-street, and to acquire and deal with the property between Millbank-street and Tufton-street in accordance with an improved scheme. The committee now report slightly amending the original plan. The committee obtained the approval of the Government to the scheme, and an undertaking on their part to assist with the Abingdon-street portion. The amended plan involves the acquisition, for the purpose of addition to the public way, of a narrow strip of the existing Victoria Tower-gardens; and it is also necessary that portions of the sites of five houses in Abingdon-street, four of which belong to the Government, should be given up. The Lords Commissioners of the Treasury have undertaken to give up the portion of the Victoria Tower-garden needed for the widening of Abingdon-street, subject to the Council's providing a satisfactory substitute for the stone yard belonging to the Government, which at present lies to the south of the garden; and they further promise that, upon the completion of the Council's portion of the scheme, they will ask Parliament to give up, subject to the existing leases, so much of the sites of the four houses in Abingdon-street as will be needed for the widening of that thoroughfare, and to purchase for that purpose the remaining fifth house. The amended plan will prevent the necessity for the acquisition of certain property which was included in the original scheme, and the saving to the Council altogether will be about £50,000. The vestry of St. Margaret and St. John have now given their consent to a contribution of £100,000 being made towards the cost of the scheme, subject to its being arrranged by a clause in the Council's Bill that the charge should fall on the new area of Westminster, as constituted by the London Government Act, and also subject to the land between the river and Millbank-street being laid out as a garden.

THE CATHEDRAL BUILDERS.*

THE author of "The Renaissance of Art in Italy," Mr. Leader Scott, has brought out lately another learned and interesting contribution to the history of art. The author of this handsomely got-up volume tries to fill up the gap between the decline of Roman art and the rise of art in the 12th century. Historians of art proceed from the decadence of Classic Rome to deal with the subsequent development of art in the 12th century. There is, as Mr. Leader Scott says, a vast hiatus of several centuries to account for, when Art was supposed to be "dead and buried, its corpse, in Byzantine dress, lying embalmed in its tomb at Ravenna"; but, the fact is, Art was not dead: it bore seed, just as the Romance languages of Provence and Languedoc form the link between the decay of classic Latin and the rise of modern languages. In art, Mr. Scott says, we find this link on the borderland of Lombardy, "where the *Magistri Comacini*, a mediæval guild of *Muratore Liberi* (Freemasons) kept alive in their traditions the seed of Classic art slowly training it through Romanesque forms up to the Gothic, and hence to the full Renaissance." This obscure period of art is also called the Provençal or Romance style. The author thinks in these Comacine Masters we shall find the connecting link between the two better-known periods. This guild of sculptor-builders nursed the seed of Roman art till they bore fruit; various styles were developed therefrom, as the Lombardo-Byzantine at Ravenna and Venice, the Romanesque at Pisa, at Milan Lombardo-Gothic, and so on. All that was good between 500 and 1200 A.D. is attributed to these Comacine builders, and to them or their influence the fine Lombard basilicas, such as St. Ambrogio at Milan and San Michele at Pavia, San Vitale at Ravenna, the cathedrals of Pisa, Lucca, &c., are to be traced. They also carried architecture and sculpture into France, Spain, Germany, and

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* The Cathedral Builders: The Story of a Great Masonic Guild. By Leader Scott, Hon. Mem. of the Accademia delle Belle Arti, Florence, &c. London; Sampson Low, Marston, and Co., Ltd.

England. With the transplantation of the Romanesque flat roofs and low arches these features were changed into the Gothic. It was these Freemasons who were sent by Gregory the Great to England with St. Augustine to build our churches. Mr. Scott says it is strange that art historians have made so little of the Comacine Masters; he was led to study this Masonic Guild by Professor Merzario's work, and in this volume he has given the result of much learning and research, and has collated many authorities who have thrown light on this obscure period.

Mr. Leader Scott first explains how all our great and noble churches of the 12th century were built with round arches, and were, in fact, in one style, and that the Lombard. We have our own Canterbury and other round-arched cathedrals, which sprang up simultaneously with others in Italy, like churches at Verona, Como, &c., and in Germany as in those at Bonn and Mayence; and in the next century we find the same mixture of pointed and round arches occur in Italy, and contemporaneously in other countries. So in the 14th century all were in pure Gothic. It seems impossible, it is said, that single architects in the different countries would all have the same ideas at the same time; the churches argue a plurality of workers. Once recognise a guild, and all becomes easy. What was the origin of the name Comacine Masters? Some think it referred to the island of Comacina, on Lake Como; others that it meant the whole province of Como. Grotius thought that the word came from a Teutonic word, meaning house builders. The author seems to favour the first supposition, and that the Comacine Masters had a nucleus in the island of Comacina, which, with Como, resisted the Lombards in the 6th century, but were afterwards subjugated by the Longobards; the masters worked for their new lords as paid architects, not as serfs. Hope, in his "Historical Essay on Architecture," decribes the great Lombard Guild. These corporations were always in league with the Church, which, in those times of war and feudal slavery, was the only asylum for the arts of peace. Ecclesiastics of high rank, abbots, prelates, &c., joined the guild. They gave designs for their own churches, overlooked the building, and employed their own monks as workmen. The Comacines were a link between the Roman Collegia and the other art and trade guilds of the middle ages; they were called Freemasons, because they were builders of a privileged class absolved from taxes and servitude. The author says there is no proof that they are the same stock from which the pseudo-Freemasons of the present day sprang. Mr. Scott's interesting and elaborate investigation as to the origin of the Comacines and their rules is too long to follow. There is no doubt the Magistri Comacini were a powerful guild in the 7th century, and were fully organised and had different ranks. The higher orders, Magistri, could design or undertake a work, or act as architects, and the Colligantes worked under or with them. Later they had lodges throughout Italy.

Mr. Scott next notices the Comacines under the Longobards. He gives the dates of the masters, and describes the plan and features of the Lombard churches. The Comacine were the only architects employed, and the Lombard churches of the 8th century show the work of the first Romano-Lombard style. The Roman basilica was the type of the earlier churches; but there were differences between the Eastern and Western forms—the former had the cupola added. Several photographic illustrations show the Byzantine influence, as in the frescoes in the subterranean church of San Clementi, Rome, of 4th century; church of Sta Costanza, Rome. San Michele at Pavia is a good example of Classic form adapted by the Comacines to Christian use; the façade is Oriental in character and detail. A very fine example of a Comacine capital is in San Zeno, Verona. It is sculptured with dragons interlaced, a good specimen of symbolical art. Many of the churches exhibit a mixture of Classic and Byzantic forms. The Civil architecture forms the subject of another chapter. The Lombards were great fortress builders, as their solid and imposing towers testify, and all Mediæval cities had them; the ecclesiastical type was square and unbroken, with corbel-supported summits, and the windows are larger as they rise. The Civil towers were chiefly circular, with narrow lights. The Comacine masters were essentially sculptor-architects; there was a sculptural and symbolic meaning in the work—it was not mere ornament. The plan of their churches was symbolic in meaning—the two-light windows symbolised the two lights of the Law and the Gospel, the rounded apse the emblem of the head of Christ. Many beautiful illustrations are given, among them the Byzantine altar of the church of St. Ambrogio, Milan; the frescoes in the Spanish chapel of St. Maria Novella, Florence; doors of the church of San Michele, Pavia, the latter Byzantine in detail and ornament. The Comacine believed in the mystic knot, hence the intricate interlaced panels. The author describes many beautiful examples of the ornamentation of this period, so full of poetic interest. The Masters under Charlemagne made progress; but we have no space left to enter into this chapter, nor the Norman link, which describes the first emigration of the Comacines. We must also leave the "Origin of Saxon Architecture," a suggestion by the Rev. W. Miles Barnes, and the chapter on "The Towers and Crosses of Ireland," which shows the influence of the Guild. The Irish Cross was exactly of the Byzantine type and ornamentation. The contact between Ireland and Italy is clear, and the saints and early missions explain much that has been a puzzle to antiquaries as to these remains. We have not been able to notice more than half this interesting volume, so full of research and suggestion. The author thus succeeds in tracing the missing links of architectural history to the Guild, and their active share in all European countries. The illustrations, numbering 83, are very beautiful examples of Italian Lombardian architecture. Mr. Scott's work is an instructive, if not quite convincing, attempt to prove the connection of this Lombard Guild with the early cathedral builders of the 11th and 12th centuries. That there are strong affinities in the form and ornamentation of their works none will question; also in the similarity of the organisation between the Roman Collegio and the Lombard Magistri. The fraternity grew and multiplied as the church building era developed, and as they approached the Renaissance era, certain families of the Guild formed lodges in the chief Italian cities, till they were finally extinguished by the Medici, when individual genius arose and the tie between art and the Church was at length broken, and art fell an evil days.

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THE DEMARCATION OF JOINERS' WORK.

ONE of the most difficult matters as regards the adjustment of work in the building industry is, says a correspondent of the *Manchester Guardian*, the apportionment of the details of employment as between carpenters and joiners and cabinet-makers. This question has been the subject of dispute in several important centres, and a conference was recently arranged between the representatives of the six principal trade-unions in the joinery and cabinet-making branches of the building industry to devise, if possible, means for the prevention of future difficulties. The trade-unions represented at this conference were the Amalgamated Society of Carpenters and Joiners, the General Union of Carpenters and Joiners, the Associated Joiners' Society, the Alliance Association of Cabinet Makers, the Amalgamated Union of Cabinet Makers, and the Scottish Union of Cabinet Makers. The conference, after discussion, adopted the two following resolutions:—(1) "That this joint conference of the representatives of the Cabinet Makers' and Carpenters' and Joiners' Trade Societies, after a prolonged discussion on the question of the constantly recurring friction between the members of the respective societies on the various classes of work upon which they may be engaged, consider that the attempt to define what work should be done by the members of the respective societies is impossible. But in order to put an end to these deplorable disputes, the only solution of the difficulty in our opinion is that in all cases where joinery or cabinet and house-furnishing firms tender for and obtain such work as ship, bar, bank, office, hotel, and the interior fittings of houses, that the members of the respective societies working for such firms should on no account accept other than the highest rate of wages, and conform to the conditions and privileges that may be established by the unions engaged in the wood-working trades in that particular district." (2) "In the event of any dispute arising between the members of the Carpenters' and Joiners' and Cabinet Makers' Trade Societies who may be working together, if not settled locally, the matter in dispute shall be laid before the respective executive committees, the men to remain at work until investigation is made into the cause of the dispute. Further, the executive committees of the above societies, pledge themselves to deal with such cases within seven days from the time notice of such has been brought to their attention. Investigations into the causes of complaint is to be made on the spot if necessary." The conference, it will be seen, suggested by the resolutions that the establishment of a practically uniform rate of wages was better than an attempt to draw up a plan of demarcation of work. The latter is, in fact, regarded by some of the members as impossible. Disputes were to be settled at conferences between the several executive committees. It was decided by the conference that a vote should be taken of the members of the six trade-unions represented in the conference on the question whether the two resolutions, as drawn, should be finally accepted. The result of the voting, which has been tabulated by the secretary to the joint conference, shows that, unfortunately, the scheme proposed in the resolutions cannot be adopted. Five of the trade-unions have voted in its favour, but the members of the Amalgamated Society of Carpenters and Joiners, the largest of the six unions, have rejected it. The votes are as follow:—Amalgamated Society of Carpenters and Joiners, for the first resolution, 5,352, against 7,648; for the second resolution, 6,103, against 6,471. General Union of Carpenters and Joiners, for the first resolution, 1,319; against 706; for the second resolution, 1,377, against 605. Alliance Cabinet Makers' Association, for the first resolution, 1,566, against 77; for the second resolution, 1,605, against 39. Amalgamated Union of Cabinet Makers, for the first resolution, 691, against 106; for the second resolution, 743, against 61. Scottish Cabinet Makers' Union, for the first resolution, 446, against 1; for the second resolution, 434, against 11. The scheme cannot therefore be put into operation, but it is hoped that further discussion may lead to the adoption of some similar method by means of which disputes may in the future be avoided.

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TRAFALGAR DAY.

THE design selected by the Navy League for the decoration of the Nelson Column on Trafalgar Day, Oct. 21, is by Mr. George W. Bellgrove, F.R.H.S., outdoor manager of the Junior Army and Navy Stores Floral Department. The decoration combines floral and electrical effects, and bids fair to exceed anything ever attempted in this way before. The steeplejacks, Messrs. J. W. Gray and Co., commenced climbing the column on Friday, Oct. 13, and reached the capital on the following day—a record for this work. The laurel wreathing used is 3ft. wide, and encircles the column four times. The electric lamps, some 300 in number, are arranged to encircle the column between the wreathing. The four tablets—representing the Battles of the Nile, Copenhagen, Trafalgar, and St. Vincent—will be framed with laurel, and electric lamps and festoons of laurel garlanding will be hung from the top of the entablature to the lions' mouths, festooned over the four tablets, and then carried from lion to lion, entirely surrounding the column. Palms and foliage and flowering plants to the value of £1,000 will be grouped on the red baize covering the base.

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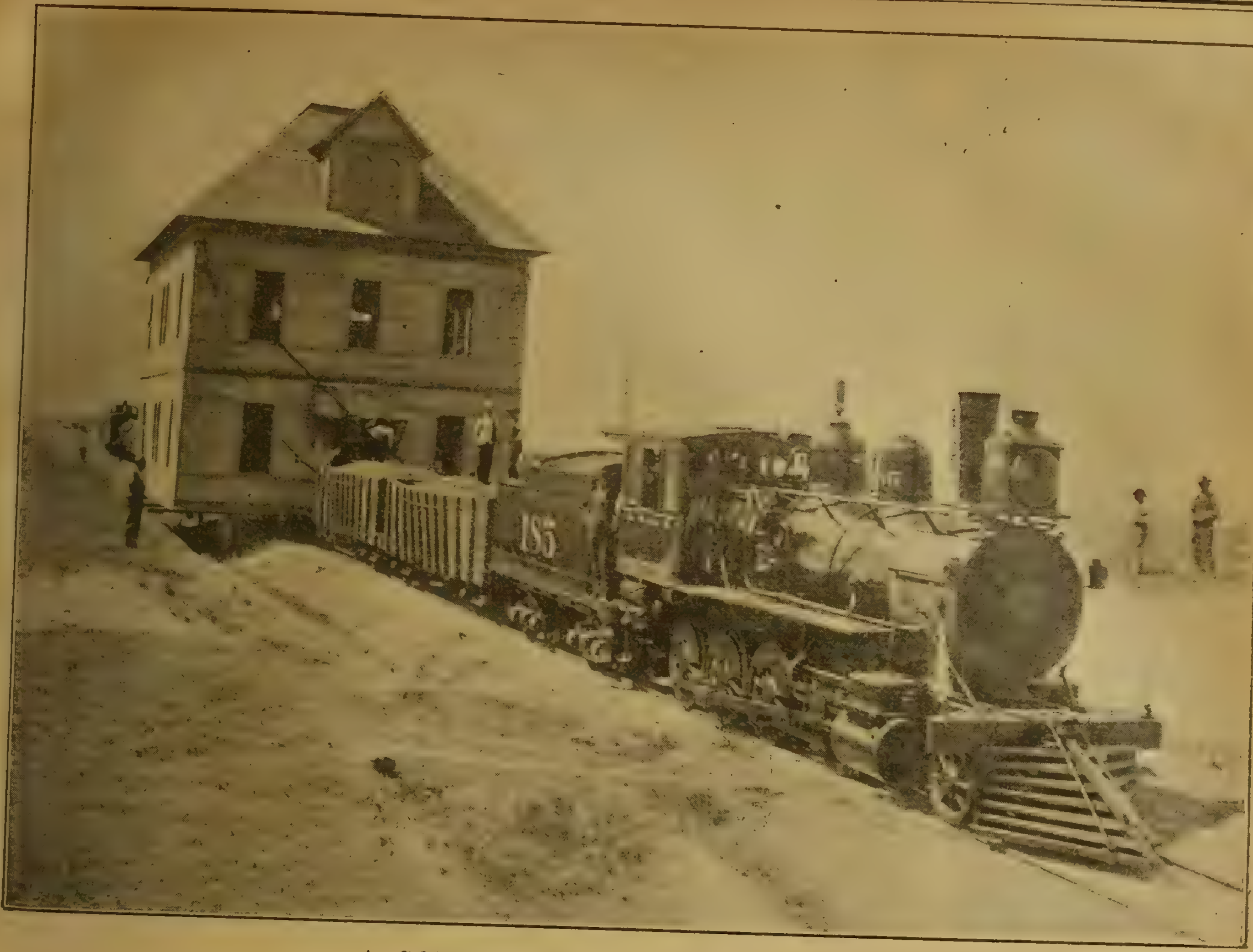
WOODWORKING MACHINES AND TOOLS.

MESSRS. MELHUISH, SONS, AND CO., 84-87, Fetter-lane, Holborn Circus, have issued a new and enlarged edition of their catalogue of woodworkers' tools and appliances, in which every conceivable tool used in woodworking is described and illustrated. As an illustrated guide to tools used by the carpenter, joiner, carver, and woodworker generally, Messrs. Melhuish's catalogue is invaluable for its completeness. The latest improvements in labour-saving appliances are included, so that the building contractor, desirous of availing himself of labour-saving tools for his workshops, will find a perusal of this section necessary. The latest improvements, best quality of tools, and the lowest prices will be found combined. Wood-working in all its branches is dealt with. Amongst the articles illustrated, far too numerous to mention here, we notice Melhuish's patent self-adjusting brass bit



A COURTHOUSE GOING TO COURT.

clips for holding brace-bits, and a capital steel tool rack, a very useful appliance, and so cheap that every tool-user should have it. Several pages are devoted to the many kinds of planes, such as jack planes, smoothing planes, trying planes, rebate and mitre planes. The "adjustable jointer gauge" is a most useful tool that can be adjusted for squaring or to any required bevel. Several American improvements are shown. The illustrations of chamfer planes include Melhuish's very ingenious tool that can chamfer or bevel any width down to ¼in. An assortment of plane irons and fittings, steel and wrought-iron planes, and a very useful router plane are shown.

Not only the tradesman, but the amateur carpenter, wood-carver, and cabinet-maker, will find many things here to add to his kit. The firm supplies a selection of well-seasoned woods for cabinet-makers and amateurs. The list of chisels and gauges, carving tools, chip tools for ladies' use as well as for technical schools, is very comprehensive, and every price is marked. The Disston celebrated American saws are specially made for this firm, and we notice a few labour-saving machines, scroll-saw, fret-saws, and other necessaries for cabinet-makers and amateurs; tool-chests for carpenters, sets of tool-drawers admirably fitted for technical schools and private students, in addition to several other machines for planing, thicknessing, and moulding. Messrs. Melhuish, Sons, and Co.'s latest catalogue should be in the hands of all the wood-working trades. There is a capital index which renders the catalogue easy of reference.

A COURTHOUSE GOING TO COURT.

THE citizens of Boxbutte County, in the State of Nebraska, recently took a vote upon the question of moving the county seat from Hemingford, where it was then located, to Alliance. Both of these towns are, of course, in the county of Boxbutte, and the circumstances which rendered the move desirable were certain changes of population, &c., which rendered Alliance the more desirable location. But while a change of location was desirable there was no necessity for a change of courthouse, as the existing building at Hemingford contained ample accommodations for the business of the county; moreover, the distance from Hemingford to Alliance was only 19 miles, and the level country between the two was singularly propitious for a feat of house-moving.

Accordingly, a contract was let to a "house-mover" at Lincoln, Nebraska, who, however, after jacking the building up and getting it on its trucks, found that his hauling machinery was not equal to the task, and cancelled the contract. The citizens were thus again confronted with the alternative of voting 30,000dols. bonds for the construction of a new courthouse or making a further effort to move the old building. It is probable that the structure would have stayed at Hemingford but for the fact that the Burlington and Missouri Railroad runs through the county, and being a heavy taxpayer would have had to bear in the taxes levied the major portion of the cost of a new house. The company conceived the bold and certainly original idea of acting as a common carrier for the courthouse itself, and transporting it as so much freight over the 19 miles of track between the two towns in question. Accordingly the building, which measured 38ft. by 50ft. and towered 51ft. above the rails, was placed upon four 60,000lb. capacity trucks, heavy bridge timbers being interposed between the bottom sills of the building and the trucks to secure an even bearing, and properly distribute the load.

Now, as the width between rails is only 4ft. 8½in. and the building was 38ft. wide, it was necessary to steady the structure to prevent it from rolling into the ditch. This was ingeniously done by placing two loaded 60,000lb. coal-cars immediately in front and behind the building and guying it with ropes, as shown in our illustration, which shows the strange procession under way.

The trip was made without any mishap at a speed which varied from five to eight miles an hour, according to the grades. The only obstacle encountered were some small cuts which had to be reduced to allow the floor of the building to clear them. We are informed by Mr. J. R. Phelan, the superintendent of the road, to whom we are indebted for our particulars, that the building is larger than it appears to be in the picture—the upper story in which the courtroom is located having a 16ft. ceiling.—*Scientific American.*

AMMONIA AS A FIRE-EXTINGUISHER.

THE editor of the *National Druggist* gives some highly interesting information respecting the fire-extinguishing qualities of aqua ammoniæ, which are worthy of attention, as the following statements will indicate:—

"In one instance where fire had originated, probably from spontaneous combustion, in a pile containing several tons of cotton-seed, and the interior of which was almost a solid body of live coal, a half-gallon of ammonia completely smothered the fire. In another, which occurred in Savenay, France, the vapours of a tank containing 50 gallons of gasoline caught fire in the linen-room of a laundry. The room was instantly a mass of living flames; but a gallon and a-half of ammonia water thrown into it completely and almost immediately extinguished the fire. The ammonia was in a glass demijohn in an apothecary's shop next door to the laundry, and was thrown into the room by the druggist as an experiment. To use his own words in reporting the circumstance, 'The effect was instantaneous. torrents of black smoke rolled upward in place of flames, and in a moment every trace of fire was gone. So completely was the fire extinguished that workmen were enabled to enter the room almost immediately, where they found the iron tank of gasoline intact.'"

Mr. M. Lea, deputy borough surveyor of Crowe, has been elected city surveyor and inspector of nuisances by the Truro Corporation.

A DISCUSSION ON ARCHITECTS' REGISTRATION.

An animated debate was held at the meeting, last Friday evening, of the Discussion Section of the Architectural Association, on the desirability or otherwise of the compulsory and legal registration of architects. Mr. W. B. Hopkins presided over the gathering, which took place at the Studio, Great Marlborough-street, W.

In opening the discussion, Mr. G. A. T. Middleton observed that the question of registration had been before the profession for many years. The present position was that anybody, whether trained or untrained, skilled or unskilled, educated or totally ignorant, could undertake to do an architect's business, and, so far as he was capable of performing those duties, had equal rights with the person of the highest qualifications and who had served his articles. In fact, anybody who chose could pose as an architect—a condition of things which existed in no other profession. There was, of course, a large proportion of well-skilled practitioners, and there were many flagrant cases to the contrary, but all were on an equality so far as the eye of the law was concerned. Let them take the R.I.B.A. examinations as a proof of the need for educating and testing architects in their duties: a large number of candidates failed in the preliminary one, a comparatively small proportion of those who passed went in for the intermediate, and a still smaller proportion sat for the final examination. As an illustration of the class of men who had posed as architects, he might mention that a short time since a clergyman in the North of England wished to build a church, and asked his solicitor if he could tell him of an architect. The solicitor at once suggested his own son's name; the young man had spent, some years ago, one twelvemonth in an architect's office, the intervening period having been passed on a fruit farm in Florida. During the last few years there had been a great levelling-up of those entering the profession, in part due to the establishment of the Institute preliminary examination, and in part to the A.A. classes; but if they wished to raise the standard all round, it would have to be made imperative that everyone seeking to practise in the profession should give proof that he had been properly trained for his duties, and this could only be effected by an Act of Parliament. Registration would mean the exclusion of incompetent and ill-informed persons, and its beneficial operation by ridding the qualified practitioner from unfair competition would be felt in provincial towns far more than in London. A Bill with this object—the Registration of Architects—had been drafted, and had been brought before Parliament for several sessions. One provision had given rise to great dissatisfaction in the profession—that all persons already practising at the time the measure was passed should be admitted to the register; but a similar stipulation had to be made in the medical, dental, and other professions, and without it Parliament would assuredly decline to pass any such Bill. These existing practitioners would, however, die out as time went on, and the longer they delayed obtaining such an Act, the longer would such ill-qualified men continue to practise. A Registration Bill would, therefore, only affect the future of the profession; but after the primary inclusion of all men established in practice none would be admitted to the register who could not prove their competence and give evidence of having been trained. The Bill was, they would thus perceive, one for the education of the future race of architects, and for the raising of the standard throughout the whole profession; and surely this was to the advantage alike of the profession and of the public. The senior and leading members of the profession could not expect to benefit by such an Act, and on this account there had been heard some selfish objections to it, nor would the middle-aged gain much; but it was manifestly to the advantage of the younger men, and, therefore, it appealed directly to the self-interest of the majority of those in the Architectural Association. Until the Bill was passed, well-trained young men would be subject to the direct competition of others who ought not to have been allowed to enter the profession until they had shown that they were qualified. Another objection which was sometimes urged was that architects were not artists, and that you could not examine an artist in his art. The R.I.B.A. examinations told a very different tale, and showed that a qualified examiner could definitely ascertain whether a candidate had or had not the power to make a design. The born artist, of whom they heard so much from certain people, was of comparatively little use unless he were properly trained in the rudiments, principles, and history of his art, and this was, he thought, obvious to all members of the Architectural Association. More or less, everybody possessed artistic instincts, and could be trained to produce work which, if not brilliant, was not antagonistic to good taste. There was, and of course would always be, differences of opinion as to whether the present Draft Registration Bill in its entirety and in every little detail was perfect; but after careful study of the measure, he claimed it was, as a whole, satisfactory, and worthy of the warmest support of the profession, while any minor defects that might reveal themselves on close consideration could be amended in committee. Its broad principles were, that while all now in practice must be allowed to continue, no future additions should be made to the list of practitioners, except of men who gave evidence of qualification. This would, when carried, raise not only the social status, but the actual art standing of the profession as a whole, and lead to as great an advance in both respects as had been manifest in the medical profession during the last thirty years.

Mr. A. R. Jemmett opened the case in opposition to registration. He felt that the passing of such a measure as Mr. Middleton had sketched would unduly exalt the professional side of their calling. At present architects were artists first, and professional men secondly; but such a scheme would emphasise in the eyes of the public the mere business qualifications of practitioners. Again, there were plenty of buildings put up under the direction of engineers, surveyors, even mere builders, that were every whit as convenient and as stable as those designed by professed architects, and if they could not erect better planned and more artistic buildings than those constructed by outsiders, the public would naturally ask what was the use of employing an architect? If architects were—as they claimed to be—artists, why should they be registered any more than painters, poets, or musicians? The burden of proof that such a step was necessary rested upon those who urged the scheme. As for raising the standard of excellence, of which Mr. Middleton had spoken, the professional bodies did quite enough in this direction. Again, there was no consensus of opinion as to what constituted an architect, and when they attempted to make up a register there would be endless quarrels and controversies as to who was, and who was not, an architect. Some might say: Adopt the Institute definition; but the view taken by the R.I.B.A. was, in his opinion, altogether too professional, and would officially fix far too low a standard. Ideas as to who should be included in the term "architect" were scattered and vague, and before such a measure as had been outlined was brought forward they ought to spend at least another ten or possibly twenty years in discussing these points, and then when they were settled they could come before the public. They must remember that if boys found a low standard set before them as the total requirements of the profession, they would not exert themselves to rise any higher than the minimum. During the last century the Lamp of Architecture had been broken, and before the scattered fragments could be gathered together and the light rekindled another generation or two must pass away. If they formed a register of architects, did the promoters intend to ignore all competitors, such as engineers and surveyors? Again, who would set the standard as to what constituted high art, and where would the examiners in art be found? It might be possible, he would admit, to examine candidates in art, but there were great practical difficulties. It had been alleged that when architects were registered they would be treated with more respect by the judges when they appeared in Court; but assuming that they were architects, they ought not to be in Court at all. Squabbles about party-wall questions and rights to light were not architect's, but mere surveyor's, business. As to the supposed public interests that would be served, their consideration should be not for the public, but for themselves as individual architects, and, after all, the great aim should be to advance the intellectual side of the architect's art. He would rather lose a little money by the too wide opening of the door into the profession than be narrow-minded as to his art. Further, the incapable humbug was of real benefit to the good architect, and his incompetence and ignorance caused the light of the true architect to shine the more brightly. Then there was the point of view of the poor student to be considered. He was strongly opposed to maintaining the profession as a preserve for the rich man's son and keeping the poor man out. He would confess that he had never read, or even seen, the Registration Bill; but the insistence upon the serving of articles, the passing of tests, and the entry upon a register would doubtless involve a considerable expenditure on the part of parents of students, and if this was the only means of insuring the recognition of architecture as a profession, he would say, in the words of the late J. D. Sedding, Perish the profession! If they only examined in construction, a great many mechanics would come forward and pass, and surely the architect ought to have some education above that of a mechanic. The remedy for dissatisfaction with the present condition of the profession was not registration of architects, but education in art. The real question before them that evening was not as to whether registration was a good thing for architects, financially or socially, or for the public, but was it likely to advance the art? The public might, under the new system, be well housed and well drained, and architects might be clothed in purple and fine linen and fare sumptuously every day, but, for all that, Architecture might be dead.

Mr. Crawford Smith thought that however Mr. Jemmett might argue, architecture was admittedly and obviously a profession. Architects professed to have a knowledge of construction, and to be able to carry it out according to ethical rules. The profession was based upon preliminary training, and they could not insure that men possessed a minimum of training unless they tested it by examination, and excluded those who did not possess it, and this was registration. As to the risk that engineers would then undertake architectural work, the public would always distinguish between the engineer and the architect, and give the commission for a bridge to the one man and for a house to the other. In the present Bill the age at which a man could enter into independent practice had been raised, wisely he thought, from 21 to 25 years. Articles ought to be insisted upon as a necessity before men were allowed to practise, as the Institution of Civil Engineers did with regard to its own students. Otherwise, they would have young men fresh from the technical schools pressing into the profession.

Mr. Maurice B. Adams said he had looked at the registration question from a distance; but, generally speaking, he was opposed to registration, mainly on the grounds advanced by Mr. Jemmett. While the architect must be ready to deal with constructional matters, with questions of drainage and sanitary details, and even builders' extras, it was at the same time necessary in a primary degree that he should be an artist, if architecture in its true sense was to be realised in his works. A country carpenter, possibly without any knowledge of the history of architecture, might construct a roadside cottage infinitely more worthy of artistic suitability than perhaps a cottage ornée designed by a registered architect of examination pretensions. His experience had been that some of the men who held themselves forth as architects by examination had designed some of the most atrocious things he had ever seen—devoid of style, without sense of proportion, even ill-constructed; in fact, devoid of a knowledge of the artistic use of materials. It was obvious that you could not examine on questions of taste, and, although he was glad to observe that persons now joining the Institute as Fellows were expected to produce working drawings or photographs of executed works, yet there had been some admitted to the Fellowship whose designs could not be ranked as artistic by any known canon of taste, and surveyors or engineers or mere constructors ought not to be registered as architects under the suggested Bill. He had yet to learn that persons who had failed as indifferent planners or constructors had erred from being too artistic. Again, it was quite possible for a man to pass examinations brilliantly, and even yet make very grave mistakes in building construction. They might discuss the question of registration indefinitely, and get no more forward. If architects exercised all their endeavours to produce good work, the public would in the long run discriminate without any system of registration between good men and that class of practitioners who had been described that evening as humbugs by a previous speaker.

Mr. Ellis Marsland observed he was on the Registration Committee which formulated the present Bill a good many years ago, and the longer he lived the more he felt the necessity for registration. It was amusing to note that they always had the artistic bogey set up by their opponents. If architecture were only a fine art such as sculpture and painting, he could agree with Mr. Jemmett; but that speaker had totally ignored the material side of their science. If he disliked a painting or a carved group, the owner could burn the one or break up the other to form a garden path, and at worst it need only offend the taste of the possessor; but an inartistic building was a permanent eyesore to every passer-by, and if from ignorance the construction was flimsy or the drainage faulty, or even the chimneys misplaced, the occupant and the public generally suffered. They must look at this question from the material side, on which all admitted they could examine architects; and the public were more concerned in these matters than in the artistic questions of which a good deal had been said. They might not, as Mr. Jemmett had suggested, be able to prevent engineers and surveyors from carrying out architectural work; but they could prevent them from posing as architects, and that was analogous to the operation of the medical Acts. He would admit there were a great many difficulties in the path of registration. The medical men discussed the question for over thirty years; but in the end those opposed to registration had to give way, and now all admitted the desirability of the step taken. At present architects were not recognised as professional men, and if the change had been beneficial alike to the profession and to the public in the cases of solicitors, architects, medical men, and dentists, it would be equally advantageous in that of architecture.

Mr. R. W. Carden considered the practical of far more importance to the architect than the artistic side of this question. One great benefit derivable from registration would be that pupils and students would receive more attention from their principals, and would have set before them a certain goal at which they must aim. Mr. Jemmett had said architects had no business to go into Court; but they did not appear in the witness-box for their own pleasure, but because they were dragged there, and when in the box they suffered in the judge's eye from their lack of legal status. The complaint that registration would make articles compulsory was answered by the reminder that the cost of articles was not necessarily very large. It was very curious that those who had objected to the Bill that evening had confessed that they had not read it. A similar Act was in force in Illinois with success, and other American States were contemplating its adoption. Other professions had overcome the difficulties and dangers incident to registration, and he confidently believed architects would be equally successful, and would value the measure when passed, as eventually it must be, when the profession was roused to a sense of the importance of the principle. The Bill would not, as Mr. Middleton had said, affect men of assured position; but it would help the younger men, and afford them some guarantee that the time and money spent in training would not be lost.

Mr. A. S. Tayler thought it would be a grave mistake to register all practitioners as architects. Many should be registered as surveyors, and the prefatory examination should be not qualifying, but a disqualifying one. The result of registration would be that men would simply study as a means to get through the examination, and would then drop it, regarding passing as an end. Who was then to set up the standard and hold the examinations. A man might possess much book knowledge, and yet be quite incapable of planning and superintending a building of artistic merits.

Mr. Harvey Piper ridiculed the fallacy latent in the speeches for the opposition, that study, examination in subjects studied, or registration could injuriously effect the artistic powers of an architect. If they could not examine in art, nor test a man's powers, of what use were the classes of design?

Mr. Matt. Garbutt said, if the only object of registration was to promote the interests of the profession he should appreciate it, but it was advocated on public grounds. The fact was the great majority of our buidings were not designed by architects, and the aim should be to necessitate that all work ought to be carried out from designs by architects. The thing to bring before the public was that by employing an architect they would obtain better buildings at about the same price as now. As a matter of fact the recent Institute examinations were not very stiff, and the passing of these and the serving of articles were no guarantees of fitness to practise as an architect. The aim should be to devise examination papers which would protect the public from thoroughly incompetent men. Examinations would never exclude a good man from a professsion, but would keep duffers out.

Mr. C. H. Brodie said the title of the measure ought to be changed to the Architects' Title Copyright Bill, but he could not see how it would help architects. How were they to prevent a man building without employing a registered practitioner? He had not heard a suggestion of such a kind. The bulk of people did not need assistance in architecture, and never would. Parliament, they might be assured, would never prohibit any man from building if he chose without calling in professional assistance, for architects' work stood no chance when compared in price with that turned out by speculative builders. Then they must look at the status and motives of those who were promoting this reform. The Royal Institute of British Architects now numbered 1,656 members of all ranks, and the Architectural Association, 1,247 members; in all, 2,903. Both bodies consistently opposed registration, and no one could deny that they contained the best men in the profession. On the other hand, who were trying to thrust the Bill on these three thousand very respectable people? A body which called itself *a* society of architects—(Mr. Middleton: It is incorporated as The Society of Architects)—well, he did not think that a large number of its members were architects. (Mr. Middleton: Who are not? Name them!) At any rate, all told, they only numbered 541 men, and on a mere counting of heads there was a majority among architects of 2,362 out of 2,900 against the Bill. This fact would take a good deal of getting over; there must be a reason for this overwhelming majority against the Bill. He could not altogether agree with Mr. Jemmett in his peculiar definition of an architect; surely by derivation the meaning of the term was chief builder. He closed by proposing a vote of thanks to Messrs. Middleton and Jemmett for coming down to introduce the subject.

Mr. George H. Smith, who seconded the motion, pointed out that one of the great points in the Registration Bill was that, if passed, local authorities would not be allowed to employ an architect for public buildings unless he was registered. The speaker was converted to the principle of registration by seeing a small builder a fortnight after his failure, in which he paid a dividend of half-a-crown in the £, boldly set up as an architect.

Mr. H. Munro Cantley, of Ipswich, urged that registration would not and could not curb the artistic ability of an architect. It would raise the tone of public opinion as to what constituted an architect.

The Chairman pointed out that registration could do no harm to architects. It could not exclude the artistic man from practice, for if he was of any good as a constructor, he would not be such a fool as to fail to pass a qualifying examination. Nor could it do any harm to the public. A man who had passed an examination could not be more ignorant than one untested.

Mr. W. H. Seth-Smith remarked that he was one of those associated with others in drawing up the Registration Bill. He was interested in hearing Mr. Brodie's observations, for he was an independent thinker; but surely, in arguing that because only a minority of the profession at present supported registration it must be a mistake, he had overlooked the universal teaching of history—that all great movements sprang from small beginnings, and were at first very unpopular. This had been notably the case in the medical and dental professions. The Bill would not, if passed, prevent a man from practising, however incompetent; but he must not use the title architect unless he placed his name on the register, and after its passing no more incompetent men would be included, a fact which would be especially appreciated by the provincial architect. In reply to Mr. Jemmett, he would point out that the Bill said nothing about pupilage as a preliminary to being registered. It was not proposed to recognise any but architects under the Act, and the original draft which aimed at the inclusion of surveyors and engineers had very wisely been dropped and amended. He could not comprehend or sympathise in any way with that extremely sentimental view of architecture as an art which ignored construction. As to the status of the profession, it would not be raised and publicly recognised until they had registration. There were three classes of men who objected to the movement: those who spoke in the interests of what they termed art, those who advocated free trade in the profession, and a few younger men who hesitated at the prospect of examination; but any capable architect could pass the proposed examination.

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MINNESOTA'S NEW CAPITOL.

THE new State Capitol of St. Paul, now in course of erection, will, when completed, be the most pretentious structure in the State of Minnesota, and will rank with the first buildings of that class in the United States. The Capitol will rest on a basement wall of granite 13ft. high. The entire superstructure above this base will be of white marble. It is proposed that the general effect shall not be broken by constructing the big dome out of any other material. The legislative appropriation for the building is 2,000,000dol. (£400,000 sterling). The principal façade of the Capitol looks towards the south. This front is 435ft. long, exclusive of the approaches, the entrance, and the steps. The only interruptions in this line of marble are the main central pavilion and the pavilions at either end. The central pavilion is adorned with a colonnade forming the front of a deep loggia. The upper part of the colonnade is adorned with sculpture, the central feature of which is a quadriga typifying the progress of the State. The quadriga is placed at the top of the pavilion and forms its crowning feature. Supporting the quadriga on either side are placed symbolical groups, and on the broad attic below the quadriga is a series of six figures symbolising the attributes of humanity which make for the progress of the State. These assume to be Prudence, Courage, Bounty, Integrity, Wisdom, and Faith. The figures, modelled by Daniel Chester French, are made of marble, and are between 9ft. and 10ft. in height. The figure of Prudence, for example, suggests one of the Five Wise Virgins, who, with graceful movement, fastens the garment at the left shoulder while raising the lamp, which is "trimmed and burning." Courage is represented by a warrior; Bounty by a woman holding a child in arms, typifying that phase of the State government which supports and cares for the young, the poor and the infirm. Integrity is represented by a figure presenting an open book, that all may read. Wisdom is shown by a male figure with a globe in the left hand. Truth, one of the most beautiful figures of the group, is shown with a mirror held up to nature.

The sculptures at either end of the building will be typical of the uses of the portions of the building upon which they are placed. Above the Supreme Court chamber one group represents ancient law, while another group signifies modern law. Immediately at the entrance of the building will be placed groups representing Architecture and Commerce. All figures above the sky-line are of bronze. Those projected against the walls are to be of white marble.

Mr. Cass Gilbert, who is the architect of the Capitol, was born in Ohio in November, 1859. He studied his profession in Boston, Mass, and in Europe. He went to New York, and was employed for a number of years by McKim, Mead, and White, and left their employ in 1882 to begin the practice of his profession for himself. Since then he has done work in various parts of the country. He is now a resident of New York, with offices at No. 111, Fifth-avenue. Mr. Gilbert built the Agricultural Hall at the Omaha Exposition; the Braver Building, in Boston; the Endicott Building in St. Paul; and the Broadway Chambers, north-west corner of Chambers-street and Broadway is now being erected after plans made by him. He is one of the founders of the Architectural League of New York.

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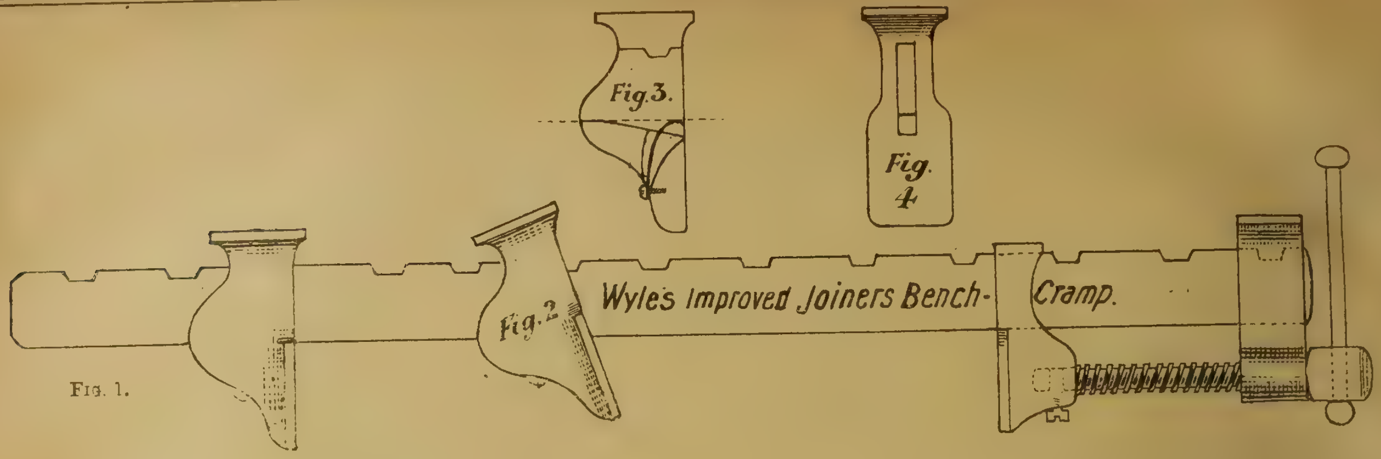
The Board of Trade have recently confirmed an order authorising the construction of light railways from Wallingford, in the county of Berks, to Benson, in the county of Oxford, and near Didcot in the county of Berks.



IMPROVED JOINER'S BENCH OR SASH CRAMP.

THIS Cramp is a very useful one, and well worth the attention of builders' toolmakers. Fig. 1 shows the shoe in position, Fig. 2 shows the shoe at liberty to slide to any part of bar. Fig. 3 is half of shoe. The thick curved line indicates spring which holds shoe in position on bar. Fig. 4 is a front elevation of shoe. The advantages of this cramp are that the edge of the bar does not in anyway damage the work. The shoe when in position (Fig. 1) is perfectly rigid and square to the work. There is no loose pin to fall out or wedge to slip. As will be seen by illustration it will stand firm on its back on the bench. Fig 4 is a front elevation of shoe. This invention is to be disposed of by the patentee, Mr. J. A. Wyles, 3, North Fields Cottages, Stamford, Lincolnshire.

THE NEW YORK HALL OF RECORDS.

NEW YORK will have a new Hall of Records. The plans for the building have been ready since June, 1897, and the contract for the erection of the building was awarded in December of the same year; but the debt limit and the difficulty in ordering the issue of bonds have retarded the matter, and it seemed at one time as though the whole scheme had been abandoned. When the Municipal Assembly finally passed a resolution, a fortnight ago, authorising the Controller to issue bonds to the amount of 2,100,000dol. for the Hall of Records, it became evident for the first time since work on the foundation had been discontinued that the plans would be carried out, and the building, designed by Mr. John R. Thomas, erected. There was no competition on the part of architects for the Hall of Records building. The contract was given to Mr. Thomas by the Board of Apportionment under the Strong administration, in recognition of his work on the new City Hall plans. When it was suggested to tear down the present City Hall of New York and erect a new building in its place, plans were solicited by the committee having the matter in charge, and 133 sets of plans were received from all parts of the United States and from abroad. A committee, consisting of Richard M. Hunt, Professor William R. Ware, and E. H. Kendall, decided that the plans submitted by Mr. Thomas were the best, and they were approved, and for a short time the successful architect thought he should erect a new and beautiful City Hall. But the people who recognised in the old City Hall one of the architectural features of the city protested against its destruction. The *Tribune* led the fight against the scheme, and had the cooperation of the best citizens and the most prominent architects, who pronounced the plan vandalism. The Legislature, in answer to the people's demand, passed a bill forbidding the destruction of the old building, and Mr. Thomas's plans became useless. The city paid him £1.400 sterling for his work, and when the Hall of Records work was placed in his hands it was understood that it was a recognition of his services in the City Hall matter.

The new building will occupy the space bounded by Centre Chambers, and Reade-streets, and a new thoroughfare which is the continuation of old Exchange-street. It will be built of Hollowell granite, the same as was used for the fronts of the American Surety and the Empire buildings.

It is the intention to make the building actually firepoof. The interior walls, together with the backing of the exterior walls, will be of brick, laid in cement mortar. The floor-beams, girders, and roof-framings will be of steel, the latter covered with black tile. The hallways, corridors, and the principal offices are to have floors of marble or mosaic. The central hallway in the two principal stories, the stairways, and the exterior walls are to be of the most approved kind of a light-coloured, fine-grained granite, the choice of quarries to be hereafter determined. The storage-room in the basement will be lined with white enamelled brick. The heating and ventilating will be by a combination of direct and indirect radiation and a complete system of fans.

The exterior architectural treatment of the building has resulted from a faithful following out of the lines dictated by the plan. No attempt has been made to construct special features, such as towers or domes, which are neither suggested nor justified by the practical conditions or requirements of the structure, and which would thus be extraneous and factitious.

The contract provides that the building shall be inclosed in 550 working days. Work was begun last spring, and about 90 days' work had been done in excavating and foundation building when work was suspended. If the plans as they have been submitted by Mr. Thomas are carried out, the city will be provided with adequate space for housing its records.

THE HEARST UNIVERSITY, CALIFORNIA.

THE judges in the international contest for the Phœbe Hearst architectural plan for the University of California have given, as we announced some time since, the first premium of 10,000dol. to E. Bénard, of Paris, to whose plan this high honour was unanimously awarded. The other four prizes were awarded as follows:—Second prize (4,000dol.), Howell, Stokes, and Hornbostel, New York; third prize (3,000dol.), Despradelles and Stephen Codman, Boston; fourth prize (2,000dol.), Howard and Cauldwell, New York; fifth prize (1,000dol.), Lord, Hewlett, and Hull. The drawings are exhibited in the grand nave of the Ferry Depot, and anyone who examines them cannot fail to be impressed with the superiority of Bénard's plans, as his design is not only the most imposing and harmonious, but he has also studied the ground so as to spare the many fine live oaks and to require as little grading as possible.

The grounds slope, says a contemporary, gradually from the gently rolling hills down to the lowland, that is almost on the level with the waters of the bay, and that the outlook is directly across the bay to the Golden Gate. A finer site could not be imagined, for it has a background of lofty hills, dotted with live oaks, which are green the year round. The college town of Berkeley does not encroach upon it with any large buildings, and there is no way in which the superb view of the noble harbour of San Francisco may be blocked. The French architect who has won the first prize has given in his plans some hints of the Acropolis at Athens, but only hints, for his design is original and modern. The major part of his buildings are of the Roman Ionic order.

The great features of his plan are the spacious court at the main entrance, which the architect calls the Fine Arts Square. About this are grouped the main educational buildings, all in harmonious architecture, and the south has two theatres of fine design. At the end of the main avenue, east of the Fine Arts Square, is the finest thing in the design—the great gymnasium, with its athletic field. The building is in Classic style, with long rows of Ionic pillars forming a spacious colonnade. Marble steps lead down to the ground, and on each side are tribunes, where great crowds may be seated at the university games. Banners fly from the tall staffs, and the whole aspect of the building is Olympic. Bénard has furnished detail plans of this gymnasium building, which is double, one side for men and the other for women, but both developed exactly alike, with a great swimming tank, running track, and regular gymnasium hall. Entrance to the gymnasium is separate from the main university grounds, so that large audiences may enter and go from the athletic grounds without encroaching on the regular college avenues.

Upon the summit of Grizzly Peak, the highest point of the university grounds, is located the observatory, while in a group on the steep hillside below are the natural history buildings. Over at one side are the dormitory buildings, which have a secondary place on the plan. Opportunity is given for extension of the plan in several directions. The great beauty of the design lies in the broad, open squares or courts, surrounded by imposing buildings and in the variety of design of the buildings. There is nothing monotonous in the arrangement or the architecture of the various buildings, and there is liberal provision for utilising the fine old live oaks that now dot the campus. The plan calls for about fifty buildings, many of them of large size, so that what it will cost to develop Bénard's design is problematical.

Some of the other prize-winning plans are extremely beautiful, and all have fine features that would make them noteworthy in an ordinary contest. The second prize, the design of Howells, Stokes, and Hornbostel, of New York, gives great prominence to the dormitories, as is usual in Eastern universities. The senior member of this firm is the son of William Dean Howells. The handling of the main court is masterly, the central building having a dome that reminds one of the beautiful dome of the Congressional Library at Washington. The judges were much impressed with these plans, but they objected to the prominence given to the dormitories, arranged on each side of one of the main avenues. Their contention was that the main college buildings, where the principal lectures and assemblies were held, should be the core of the university, and not the dwelling-places of the students.

Perhaps the most original plan was that of Despradelles and Codman, of Boston, which took third prize. The buildings are grouped in a semi-circle, with a splendid central court, but the plan does not permit of open spaces, or the utilisation of trees and shrubbery. The fourth prize, won by Howard and Cauldwell, of New York, was fine in general conception and grouping, but the main buildings were so much alike in architecture as to detract from the plan. The fifth prize, won by Messrs. Lord, Hewlett, and Hull, of New York, was admirable in design, but it would cost a fortune in grading and walls to make it practicable.

E. Bénard, who won the first prize in this competition, and whose pseudonym was "Roma," is fifty-five years old, having been born in 1844 at Goderville, Seine Inférieure. He is a graduate of the Ecole des Beaux-Arts, and in 1867 received the Grand Prix de Rome. His design for a fine arts building, which won this prize, was practically reproduced in the art palace at the Chicago World's Fair. He is also the designer of the Tribune of Commerce at Fécamp and the churches of Bleuville and Mare-aux-Clercs; he restored the Château of Sassetot, and he furnished the decorations for the Casino at Nice and the Franco-American Club in Paris.

What will be the first work done on these plans is uncertain, but it is expected that Mrs. Hearst will soon make a beginning, and that the first structure will be the great gymnasium building. All plans are tentative, and it is not expected that actual gifts will begin to come in until it is seen how much will be the endowment furnished by Mrs. Hearst. She is so thoroughly in earnest in her desire to make these the finest college buildings in the world that her gift cannot fail to be princely. It cannot fail, also, to act as an incentive to other California millionaires to have their names perpetuated in some of these beautiful buildings on the hills of Berkeley.

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ARCHITECTURAL PHOTOGRAPHY.

In a paper read before the Photographic Club Mr. Henry W. Bennett said he would exclude from his lecture all those common or garden advices generally given to the same class of amateur, and confine himself principally to those matters on which differences of opinion might exist amongst experts. He first dwelt on the special difficulties encountered by the architectural photographers. The Scylla of limited space on the one hand, and the Charybdis of a too wide-angle lens on the other, were the two principal dangers encountered, which very frequently led to disaster. The judging of the length of exposure, too, is generally very difficult, and actinometers are of no value, whilst the so-called "intuitive" method of judging the exposure by the appearance of the picture on the ground glass must be altogether discarded. In fact, it is only by experience that one can hope to overcome this difficulty. The best atmospherical conditions will generally be those when light clouds are in the sky, especially when they are low down, as this illumination is best suited to reduce the harsh contrast frequently encountered in this kind of work. As already mentioned, the angle of the lens used is a most important feature, whilst it is generally impossible to work with long-focus lenses; wide-angle lenses frequently give monstrous results. Mr. Bennett found that a 7½in. lens on a whole-plate gave as a rule the best results. It is, however, necessary that the lens cover more than the plate, so as to allow the use of the rising front to its fullest extent. A flat field is, of course, very desirable, and Mr. Bennett is of opinion that the modern anastigmat is in this respect a great improvement on the older lenses. As to the position of the camera, it ought to be about 5ft. to 6ft. from the ground, as a higher elevation might very often be detrimental to the picture. Owing to the long exposures generally necessary, the absolute steadiness of the camera is of great importance, and, in order to secure this, Mr. Bennett recommended a tripod stay, one or two of which are on the market, although they are but seldom bought. In the absence of a proper tripod stay, a large rug will do good service. Mr. Bennett considers the backing of the plate essential. As to development, he invariably begins with what would be generally called a normal developer, and changes the same, as soon as the picture appears, according to requirements. He does not recommend (although this may appear safer at first sight) a diluted developer to begin with, as in this case it would be frequently very difficult to build up density afterwards. With regard to printing, very few negatives of this class can be printed without modifications of some sort. Mr. Bennett recommends covering the negative with tracing-paper; to cut out the highest lights and the deepest shadows with a second layer of tracing-paper. He protested against the word "faking" being applied to an operation of this sort, which is indispensable in order to get an harmonious picture. Touching upon the question of pictorial effect generally, Mr. Bennett was glad to notice that there was a growing tendency to consider this point more and more. Pictorial effect is, however, not inconsistent with sharpness throughout; and he protested strongly against that section of the photographic community which found salvation in "out-of-focus" effects. The suggestion of distance is just as important in a picture of this class as in landscape photography, and an otherwise satisfactory photograph might often be spoilt through its absence. There are photographs in the London exhibitions now which show this defect, and this is all the more regrettable in those cases where it might easily have been avoided, as, for instance, in photographs of church entrances, where the effect could have been obtained by opening the door instead of keeping it shut. Another defect which one frequently meets with (even in photographs that have passed the selection committees of our principal exhibitions) is the want of completeness. To be a success, the picture must be continuous; the principal object must not take too much space, or be only partially shown.

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CHIPS.

The West Ham Town Council have decided on the largest scheme for municipal workmen's dwellings that has ever been brought forward in this country. The proposal is to obtain Parliamentary powers to acquire 100 acres of land, on which it is computed 3,000 houses can be erected, at a cost of £1,000,000. The council have already erected a large number of workmen's dwellings, and this scheme, it is thought, will meet the needs of the district.

Twelve cottages are to be provided by the Corporation of Great Yarmouth, to furnish accommodation for the families displaced by the demolition of houses for the widening of Kitchener-road, and for these twelve sites have been set apart on Garfield-road, North-denes. Plans have been prepared for the assent of the Local Government Board.

The death is announced of Mr. E. J. Cobbett, R.B.A., in his 85th year. Mr. Cobbett was one of the earliest members of the Savage Club and of the Society of British Artists, and his pictures were shown in the exhibitions of the Royal Academy for over 30 consecutive years. He began life as a woodcarver, and some of his work is to be seen in York Minster.

Mr. Quick, of Coventry, has been appointed as architect by the Nuneaton Board of Guardians for the enlargements at the workhouse.

The new pupil teachers' centre built for the Sheffield School Board, in Holly-street, in that city, was opened by the Duke of Norfolk last week. The building, which accommodates 540 students, has been built from plans by Mr. Herbert W. Lockwood.

The public opening of the Marine Lake at West Kirby will take place on Saturday afternoon in next week (the 28th inst.) The chairman of the urban district council will take occasion to present an address to Mr. Thomas Foster, the council's engineer and surveyor, on the completion of the work.

A new Wesleyan Chapel at Castle Bytham was opened last week. It is Gothic in style, and is seated and finished in pitch-pine. Messrs. Hinson Brothers, of Stamford, were the architects.

The Dewsbury Town Council have approved of an application being made to the Board of Trade for a provisional order authorising the construction of Tramways within the municipal borough of Dewsbury.

A brass has just been completed by Messrs. Colman and Co., of St. Andrew's Hill, Norwich, to be placed in St. Philip's Church, Norwich, to the memory of the late Canon Nash. The brass is set out in quatrefoil with acanthus border filled in with pale blue, the outer angles being foliated rose pattern cut out in relief.

A memorial to the late Mrs. H. B. Cary has just been erected in the cemetery at Tarkastad, Cape Colony, by Messrs. Harry Hems and Sons, sculptors, of Exeter. The monument consists of a huge block of unwrought Dartmoor granite, upon which stands a tall, slight cross of the white marble. The inscription is in metal letters inserted into the base block.

Frederick R. Hutton, Professor of Mechanical Engineering at Columbia University, New York City, has been appointed dean of the School of Applied Science of that institution, having charge of the schools of engineering, chemistry, and architecture.

Mr. Andrew Carnegie, of Pittsburgh, laid, on Friday, the memorial-stone of a free library now being erected in Catherine-street, Dumfries, for the joint use of that burgh and Maxwelltown. Although the "foundation-stone" was thus laid by Mr. Carnegie, who has given £10,000 for the erection of the building, the competition for plans is still open.

At Bath, on Friday, Col. A. G. Durnford, R.E., held two inquiries concerning applications by the town council to raise loans. The first had reference to the £4,000 needed for the laying out of a public pleasure-ground on Beechen Cliff, and the second was for power to raise a loan of £26,000 for electric light purposes. It was explained that the money was needed for extra amounts beyond the original contracts, for improved plant at the works, for a low-tension network for extension of mains for public and private lighting, &c. Details of the various items were given by Mr. R. Hammond, consulting engineer, and Mr. Metzger, city electrical engineer.

Engineering Notes.

New Main Line between South Croydon and Red Hill.—On the London, Brighton, and South Coast Railway there will be opened on November 1, says a correspondent of the *Times*, the first section of a new line which should effect a substantial improvement in the working of that company's trains to and from Brighton. At present those trains run on what are the Brighton Company's lines as far as Coulsdon, and then over the South-Eastern Company's lines to Red Hill, where they rejoin the Brighton Company's system. Each of the companies has power to run over the existing lines of the other along this route as far as Red Hill, the South-Eastern entering on the Brighton Company's portion at Bermondsey. The Brighton Company have now put down two extra lines of rails from South Croydon to a new station, called Stoat's Nest, near Coulsdon, and thence they have constructed an entirely new railway which crosses the main line of the South-Eastern Company a little further on, then runs parallel with it a certain distance, goes through a tunnel 2,200 yards long at Merstham, and eventually joins the old Brighton lines at Earlswood, just to the south of Red Hill. In this way the Company secure an independent route between London and Brighton. The section of the new line to be opened on November 1 will be available for suburban traffic as far as Stoat's Nest, though goods trains will from that date run over the entire line. The through passenger trains to or from Brighton will be able to proceed by this route from the beginning of the year. At present the Brighton Company's suburban traffic ends at South Croydon, but the new arrangement will extend it to Stoat's Nest, and also provide a new station at Purley Oaks, half-way between South Croydon and Purley. Powers for carrying out the enlargement of Victoria Station were obtained last Session, but another 12 months will be required to complete the negotiations for buying up land, and not until that stage has been reached can the actual stage of reconstruction begin.

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The vestry of Battersea have agreed to expend £4,061 upon the provision of refreshment-rooms at the town-hall, £2,327 upon wood-paving works at Lavender Hill, and £4,795 upon the erection of a coroner's court adjoining the baths in Latchmere-road.

At the quarterly meeting of the Lincolnshire County Committee, at Lincoln, on Friday, the scheme for erecting an observatory in the Old Keep at Lincoln Castle was sanctioned, subject to a condition that the buildings shall not be commenced until sufficient funds for the erection and future maintenance have been raised. The Chairman, Canon Hutton, mentioned that the building and all the instruments in it would become the property of the county, and the plans also showed that it would not be an eyesore.

A fire occurred at midnight on Saturday at J. E. Finchett and Co.'s timber stores, Brocklebank Dock, Bootle. The Bootle and Liverpool Fire Brigades were in attendance, and prevented the flames from spreading, although an immense quantity of valuable timber, including cedar, mahogany, oak, and walnut, and other well-seasoned stock could not be saved. The damage exceeds £6,000.

Many properties brought to the Mart, Tokenhouse Yard, during last week, though presenting features of interest to the investor, were of that class which is always more or less difficult to dispose of under the hammer. The numerous withdrawals that characterised the proceedings, together with the short supply of house property of the Metropolitan type, explain the amount of the returns, which were £55,728 only, as against £93,320 in the corresponding week of last year.

At a meeting of the Council of the Royal Society of Painter-Etchers and Engravers, held last week, Mr. Arthur Evershed was elected hon. treasurer of the society, and Mr. Cloudesley Brereton secretary.

At York Minster, on Friday, two brasses placed in the north transept as memorials of officers and men of the King's Own Yorkshire Light Infanty were unveiled, and at the same time three sets of colours belonging to the regiment were handed over to the custody of the Dean and Chapter, and were hung in the same transept.

The corporation of Bootle have appointed Mr. William Ryle Wright, at present electrical engineer to the corporation of Burnley, as their electrical engineer, at a salary of £300 per annum, rising by increments to a maximum of £400 per annum.

Building Intelligence.

Brighouse, Yorks.—The Albert Theatre and Opera House was opened on Thursday evening in last week. It has been erected from plans by Messrs. Sharp and Waller, architects, Brighouse, and occupies an excellent frontage to the main thoroughfare in the borough. There are three shops in front, the remainder of the building being used for theatrical purposes. The front of the house comprises stall and pit, dress-circle, promenade, and gallery, with a seating capacity for 1,200, and holding capacity for 1,600 people. The dress-circle and stalls are fitted with tip-up velvet chairs, and the pit and gallery with backed seats. The dimensions are: width of stage, 50ft.; depth of stage from fireproof curtain to back wall, 25ft.; height to grid, 40ft.; height to fly floor, 19ft. 6in.; proscenium opening, 28ft. wide, 20ft. high. Eight dressing and super rooms are provided. The cost of the premises has been about £4,000.

Eastleigh, Hants.—The foundation-stone of an extension of the parish church was laid last week. The new building, including nave, south aisle, chancel, and organ-chamber, is estimated to cost about £10,000, towards which £5,000 is in hand, and with the present building as the north aisle is calculated to accommodate over 900 worshippers. The architect is Sir Arthur W. Blomfield, A.R.A. At present only the new nave and aisle is being proceeded with, the tender of Mr. Wm. Parmenter, of Braintree, Essex, for £6,540 having been accepted, and this is estimated to seat 700, or double the number the present building will accommodate. This tender will include everything except the architect's fees. The contract for the chancel will be placed at a later date, and meanwhile the east end of the new nave will be used as a temporary chancel. Plymouth rock, with Bath stone dressings, is the material being used for the building, and the columns and arches will also be of stone. The interior will be lined with brick and plaster. The total length of the church, when completed, will be 130ft. (allowing 38ft. 6in. for the chancel), and the width 55ft. 3in. The contract time for the completion of the nave and aisle will expire on Ash Wednesday, 1901.

Eccleston, St. Helens.—The new mission church and schools in connection with Christ Church, Eccleston, which have been erected at a cost of about £4,000 in Knowsley-road, St. Helens, were opened by the Earl of Derby, on Friday. The work of erection was carried out by Mr. Fred Brown, builder and contractor, St. Helens, from plans prepared by Mr. Goodwin S. Packer, architect, Southport. They are in the Early English style. The mission church has accommodation for 500 worshippers; the school premises have room for 342 scholars; while the parish-room will accommodate about 150 persons.

Exeter.—The new Congregational church in Friernhay-street was opened on Tuesday. It consists of a nave, separated from wide north and south aisles by columns, with battlemented caps supporting arcading, enriched with traceried panelling. From the caps spring ribs, which divide the semi-hexagonal ceiling into bays. The choir, with organ-chamber and vestry on either side, occupies the west end of the church, from which it is separated by a choir arch, springing from responds. The platform is raised three steps above the body of the church, and has carved oak fittings. That of the choir stalls for 22, with traceried fronts and massive ends with crisp foliage, was executed by Messrs. Jones and Willis, of Birmingham; while the carved-oak pulpit on the south side, with reading-desk on the north side of choir, and ornate carved communion table, are the work of Messrs. Harry Hems and Sons. The fittings are Perpendicular in style. The contractors for the general seating, which is in pitch-pine, were Messrs. West and Collier, of Newbury. The seven large windows in the aisle will show in stained glass a series of stirring events in the history of Nonconformity. These are being executed by Messrs. Jones and Willis, of London, and two are already fixed. One is a representation of the Landing of the Pilgrim Fathers at New Plymouth, and the other depicts the Expulsion of the Nonconformists on St. Bartholomew's Day, 1662. The four windows of the choir are filled with stained glass, in which are inserted picture panels of "The Sower" and "The Good Samaritan." These are by Messrs. F. Drake and Son, of Exeter, from whose studios have also come the two-light windows in the north aisle and the windows in the two staircases. The two east windows over entrance are by Messrs. Mitchell, of Exeter. The electric lighting is by Messrs. Booking and Co. Messrs. Wippell and Co. supplied the brass work and other fittings. The general contractor for the alterations is Mr. W. Brealy, of 163, Cowick-street, St. Thomas, Exeter. Mr. Harbottle Reed, of the same city, is the architect.

Kelso.—Morebattle Church, near Kelso, was opened on the 15th inst., after being closed for alterations and additions. These have left nothing of the old building but its walls. A chancel has been added, and the mural monuments formerly located on the walls of a burial vault taken down to make the chancel have been erected there. There is an end gallery, and space lost by removal of old galleries has been made good by addition of the chancel. The old and new windows are in Romanesque. A font in Sicilian and Rouge Royal marble, octagonal, with faces panelled and decorated with symbolic sculpture, has been presented, along with a harmonium, by residents of the district. The works were carried out from plans by Messrs. Hardy and Wight-Eder, at a cost borne in about equal proportions by the heritors and the parishioners, the cost being about £1,000.

Kilburn.—Services have been held in the R.C. Church of the Sacred Heart, Queen's-road, in celebration of the completion of the fabric. The first portion of the edifice was built nearly twenty years ago, and consisted of four bays of the nave. The church, as now completed, has six bays in the nave, chancel, and side chapels, three new confessionals projecting from north wall of aisle, and sacristies. The church is 40ft. in length, and the planum is reached by eight steps. It terminates with an apse, with a two-light traceried window in each bay. From the principal of the roof dividing the nave from the chancel is suspended a hanging rood. The roof of the chancel has been decorated from designs by the architects, and has been erected by Mr. Charles Lyall, and a labour of love on his part. The internal length of the church is 121ft. by 50ft. in width across nave and aisles. It is 60ft. in height. The high altar is made of Beer stone, and is approached by three steps of oak. The altar stone is supported by four marble columns, and beneath, between the columns, are carved panels. In the centre one is carved the Lamb, and in those on dexter and sinister sides are angels holding scrolls, on which is carved "Adoremus in æternum sanctissimum Sacramentum." The tabernacle is carved in stone with throne above, and two angels in adoration on each side. Surmounting this is the canopy supported on dark marble shafts. On each side are curtain cranes of iron, painted and gilt, from which are suspended curtains. The Lady altar is placed in the chapel on the gospel side; beneath is carved the Annunciation. In the centre niche is placed the statue of Our Lady, and in the panels on each side are carved subjects of the Nativity and the Flight into Egypt. The communion rail consists of brass standards, on which rests an oak rail. The whole has been carried out from the design of Messrs. Pugin and Pugin.

Leeds.—The new Victoria Arcade in the centre of the city will be opened to the public on Monday next. It is arranged in the shape of a letter L, with entrances in Upperhead-row and Land's-lane—the latter entrance facing the top of Thornton's Arcade, the oldest in Leeds—and occupies a site whereon stabling and cottage property of a ramshackle nature originally stood. With one exception the whole of the shops, of which there are twenty-six, each with a show-room overhead, have been let. A dome is erected over the angle where the arcade is at its widest. The footway is laid with Venetian mosaic, and beneath is a subway containing the sewers, water-pipes, and electric lighting and gas mains. Four incandescent electric lights, each of a thousand candle-power, will serve to illuminate the arcade. The work has been performed by several contractors, to the design of Messrs. Thomas Ambler and Son, under a scheme suggested by Mr. J. J. Mosley, agent for Mr. F. W. Dawson, of York, Scarborough, and Tadcaster, the owner of the estate.

Oxford.—A number of renovations and improvements are being carried out at various university buildings. Among the former is the work of preserving the paintings on the ceiling of the Sheldonian Theatre, which were executed by Robert Streater, Sergeant Painter to Charles I. Mr. R. Nairn, the painter commissioned for the purpose, is working under the supervision of Mr. Morrill, of the National Gallery. The new Radcliffe Library, which is being erected at the cost of the Worshipful Company of Drapers, is making considerable progress, and the extension to St. John's College, begun in 1881, is now being proceeded with. A very desirable improvement has been effected at Christ Church by the carving of the ground bosses in the north cloisters. The cloisters were restored about 1870-71 from the designs of the late Sir Gilbert Scott, but the greater number of the bosses were until recently left in the rough block. A number of improvements have also been effected at the University Press. Extensions have been made in the secretary's offices, and new offices have been erected for the Controller.

South Shields.—The new Readhead wing which has been built to the Ingham Infirmary at South Shields was opened on Saturday. The wing has been designed to harmonise with the original building, and is faced with brick, moulded stone dressings being employed. It comprises two main wards, 96ft. by 26ft., four isolated wards, 19ft. by 14ft., convalescent day-rooms, 18ft. by 16ft. nurses' kitchen and sitting-rooms, and provides accommodation for 48 extra patients. It is planned to give the maximum amount of sunlight. The upper floor is reached by a stone staircase, faience work being introduced at the approaches and adjoining arches. In addition to the new wing, the old kitchen department has been remodelled, and a new washhouse, laundry, and mortuary have been erected and fitted. The buildings, which have cost about £8,000, have been carried out under the supervision of Mr. Henry Grieves, A.R I.B.A., South Shields, whose designs were selected in competition.

Yarmouth.—New premises have just been erected at the corner of Regent-street and Hall Quay for the London and Provincial Banking Co. The building is in style a free treatment of English Renaissance, worked out in Portland stone and red brick. The banking-room on the ground floor is entered from the corner, and has teak doors and windows, with oriel window above it. The room itself is floored with marble mosaic in front of the counter, and diagonally arranged teak blocks behind it. All the fittings for business purposes are of teak. The windows are of plate-glass with brightly polished brass rods and green curtains. A Teale stove with Doulton faïence mantelpiece is placed in the room. The manager's room adjoins, and near by is the strong-room, built of Staffordshire brick and concrete, and lined with white glazed tiles, and the various offices for the staff. The first and second floors comprise a residence for the manager, approached by private entrance. The contractor for the whole work was Mr. G. W. Beach, of Yarmouth. Mr. Howard, of Norwich, carried out the carving in stone. The bank was built from the plans and designs, and under the superintendence of Mr. Arthur S. Hewitt, A.R.I.B.A., of King-street, Yarmouth.

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On Sunday, at the church of St. Lawrence Jewry, E.C., a stained-glass window was unveiled in memory of the late rector, the Rev. M. S. A. Walrond. The window, which occupies a position in the extreme north-west of the church, is dedicated to St. Matthew, and completes a series of windows upon the north side of the church, illustrative of lives of the the Four Evangelists.

At Moynalvey, in Meath, the Most Rev. Dr. Gaffney, Roman Catholic Bishop of Meath, laid last week the corner-stone of a new church. The building is Romanesque in style, and will, when completed, comprise nave, sanctuary, and sacristy, with heating chamber. The nave is 80ft. long by 28ft. in width, the sanctuary 20ft. long by 20ft. wide, the sacristy 14ft. by 30ft.

The corporation of Great Yarmouth have received for approval plans of a railway station by the Great Eastern Railway Company at Southtown at an estimated cost of £100,000. At the same meeting a report from a committee recommending the erection, at an outlay of £8,000, of public abattoirs near the refuse destructor in Caistor-road, was adopted. The plans prepared by the borough surveyor show a cattle-market sufficient for present needs, with room left for extensions; four slaughter-houses with lairage for private occupation and shelter for horses and vehicles; a general slaughter-house, 78ft. by 21ft.; cooling-room, 78ft. by 15ft.; chill-room, 78ft. by 13ft. 6in.; lairage, 78ft. by 23ft.; ample space being left for extensions.

PROFESSIONAL AND TRADE SOCIETIES.

Birmingham Architectural Association.—The annual conversazione of this association was held at the rooms of the Royal Society of Artists, New-street, on Friday evening. In addition to the society's exhibition there was a collection of architectural drawings illustrative of the work done in the profession locally. Members and guests, numbering about 100, were received by the president, Mr. W. H. Bidlake, and they spent a pleasant evening.

The Edinburgh Architectural Society.—This society opened its session on Wednesday, 11th inst., with the annual business meeting. The following officials for the year were elected:—President, Mr. Alfred Greig; vice-president, Mr. P. E. Nobbs, M.A.; librarian, Mr. John F. Matthew; treasurer, Mr. A. Hay Lamont; joint hon. secs., Messrs. Andrew Muir and Colin Cownie.

Glasgow Institute of Architects.—A meeting of the Glasgow Institute of Architects was held on Tuesday in the rooms, 187, Pitt-street, to receive the thirty-first annual report and to appoint the council for the ensuing year. Mr. David Barclay, F.R.I.B.A., president, was in the chair. The report stated that the number of members on the roll, exclusive of honorary members, was now 70. The report, which also showed the funds to be in a very satisfactory condition, was adopted, and the council was afterwards appointed. Reference was made to the death of Mr. Jas. B. Stewart, of Greenock, who had been a member of the Institute for the past eight years; and Mr. Wm. Simpson, the well-known artist. It was stated that the Alexander Thomson Memorial Trustees had now made arrangements for the next triennial competition, the subject being "A Gentleman's Country House." The draft of the Glasgow Buildings Registration Bill, 1900, was remitted to a committee of the council for consideration. The council appointed a committee, of which Mr. A. N. Paterson is convener, to make inquiries as to getting up an exhibition of photographs of the architectural works of deceased Glasgow architects and others at the International Exhibition of 1901.

Institution of Civil Engineers.—The council of this institution have, in addition to the medals and prizes given for communications discussed at the meetings of the institution in the last session, made the following awards in respect of other papers dealt with in 1898-1899:—Telford Medals and Premiums to L. Franzius (Bremen) and G. H. Thierry (Bremen); a George Stephenson Medal and a Telford Premium to G. Watson (Leeds); and Telford Premiums to L. F. Vernon Harcourt (London), F. Osmond (Paris), Max am Ende (London), T. E. Stanton (Liverpool), W. G. Hibbins (Bristol), James Strachan, C.I.E. (London), T. Donaldson (London), and T. W. Barber (London). For Students' Papers:—The James Forrest Medal and a Miller Prize to H. Lapworth (Birmingham); Miller Prizes to F. C. Grimley (Colchester), W. Middleton (Chelmsford), F. T. Wolseley-Lewis (Manchester), A. H. Tyack (Manchester), R. A. E. Murray (Glasgow), C. R. Rutherglen (Glasgow), and W. D. S. Brown (Newcastle).

The Surveyors' Institution.—A brilliant and successful conversazione was held on Thursday night in last week at the Surveyors' Institution, Great George-street, Westminster, in celebration of the formal opening of the new buildings which have been erected at a cost exceeding £35,000, from designs by Messrs. Alfred Waterhouse and Sons. The guests were received by the president, Mr. T. M. Rickman, F.S.A., and Miss Rickman. The house, of which the whole was thrown open for inspection, contains on the ground floor a reading-room, secretarial offices, and several consultation and arbitration rooms; on the first-floor a council-room, lecture-hall, and library; and above, on the second floor, the Forestry Museum with other rooms. An attractive programme was provided for the entertainment of the visitors. The Premier String Band played at intervals in the entrance-hall, and in the library the Ariel Quartette sang glees and part-songs. In the lecture-hall Messrs. Maskelyne and Cooke's animated photographs were on show, and Dr. David Walsh's demonstrations of X-rays and fluorescing tubes proved specially attractive to the guests. Professor Allan Macfadyen, of the Jenner Institute of Preventive Medicine, exhibited specimens of pathogenic and other bacteria, together with various antitoxins under powerful microscopes in the secretary's room. The reading-room contained a collection of typical maps, photozincographs, and facsimiles, lent by the Ordnance Survey Department, by permission of H.M. Board of Agriculture, as well as a quite unique collection of incandescent electric lamps, illustrative of the invention and progress of this system of electric lighting as evolved by Edison and Swan. Swan's first lamp was shown in comparison with Edison's first type, and the various steps leading up to the present almost perfect lamp were traced one after another. We are informed that the firm of Edison and Swan also installed the very beautiful system of electric lighting, by which the entrance-hall and the upper hall were illuminated. This consisted in a series of small incandescent lamps, hung alternately globular and cylindrical, at about 6in. apart, in festoons from the marble columns and from the ceiling. The diffused light from these was especially adapted to show to advantage the architectural features of the building. In the library was a very fine set (some 100 in number) of Vandyck etchings, lent by Mr. R. Vigers, a past president of the Institution, and a small collection of valuable Wedgwood ware, lent by Professor T. Roger Smith, F.R.I.B.A. Messrs. Adie, Stanley, Elliott, and Baker and Mr. Macginnis showed some interesting novelties and improvements in surveying and scientific instruments. The attendance on each evening was good, the guests numbering about 900 in all. We understand that the method of distributing the invitations for the two evenings among the members was the very simple and quite impartial one of inviting to one evening's reception all whose names appear in "left-hand" pages of the list of members, and, for the other evening, inviting the members on "right-hand" pages. The success of this principle was amply proved by the fact that the attendance was almost equally divided between the two occasions.

CHIPS.

The Leeds board of guardians have decided to ask for a formal order from the Local Government Board for power to obtain a further loan of £5,000 for the building of a new workhouse laundry.

Ald. Fletcher has been selected as Mayor of Workington for the coming year. Mr. Fletcher is a Liberal in politics, and carries on the business of joiner and builder.

Memorial-stones have been laid in connection with the enlargement of the Ebenezer English Baptist Church at Cefn Mawr, Ruabon. The estimated cost is £1,100, and there will be seating accommodation for 430, together with a schoolroom which will accommodate 300 children. The architect is Mr. J. W. Jones, Brooklea, Acrefair, the superintendent of the Sunday-school.

Mr. William Jones, a well-known contractor in the Fylde, died, on Tuesday, as a result of injuries received through falling down a church steeple. Deceased, about a month ago, was working at the church of the Sacred Heart, Thornton, when he fell and sustained terrible injuries. His head was fractured, and one of his legs broken.

The urban district council of Teignmouth passed at their last meeting plans for 150 houses, to be erected on the site of Bitton House, submitted by Messrs. Slocomb, Tapper, and Lintern. Bitton-road, opposite the site of the old mansion, whose grounds are to be built over, will be widened to 27ft. 6in.

A fire occurred on Friday at the extensive saw-mills and timber yards of Messrs. Roberts and Cooper, Brierley Hill, South Staffordshire, and did damage estimated at £50,000.

The ceremony of laying the foundation-stone of the new works at Granton of the Edinburgh and Leith Gas Commissioners, took place on Monday. The works are being carried out under the supervision of Mr. Herring, the gas manager.

The new Alun County Schools at Mold, which have been erected at a cost of £3,500, were opened on Tuesday by the Duchess of Westminster. The buildings provide a dual intermediate school, with accommodation for 70 boys and 50 girls. The principal features are the chemical laboratory and lecture-room in the boys' department, and the large assembly-hall, approached from both departments. The floors of the building are of deal wood blocks, and the walls are lined throughout with glazed brick dado. The exterior of the building, which is of red Ruabon brick and terracotta, has a façade of Flemish character. The architect was Mr. F. Bellis, of Bangor, and the contractor Mr. Thomas Roberts, of Mold.

LEGAL INTELLIGENCE.

Gomersal Arbitration Award.—The award of the arbitrators in connection with the recent arbitration to fix the price to be paid by the Gomersal District Council for land at Oakwell to be used as sewage outfall works has been received. The amount is 2,703, which is to cover not only the value of the land required, but also any damage which might be sustained by the claimant by the severance of the land from the estate. The council's engineer valued the land at £1,250, and the valuation put upon it by the owner was £8,576.

The Workmen's Compensation Act.—At the Marylebone County-court, Judge Stonor, in giving judgment on Friday in the case of "Bennett v. Aird and Sons," said the applicant in this case was employed by the respondents striking an iron wedge to open a road, underneath which water pipes were being laid by them. Another workman was striking the wedge alternately with the applicant, and knocked it on one side, and thereupon the applicant's hammer missed the wedge, swung right round, and dislocated his shoulder, which he had since been unable to use. The manager, who appeared as representative of the respondents, submitted that the case did not come within the Act. The learned Judge, after considering the construction of section 7 of the Act and the significance of the words "mechanical power," said that on the whole he thought that the words "mechanical power" must in the present case be construed as *ejusdem generis* with those mechanical powers previously mentioned—viz., "steam and water," which act automatically and continuously after having been set in motion in the first instance by manual labour, and he therefore, on the whole, was of opinion that the present case did not fall within the Act, and gave his award in favour of the respondents, without costs.

A Bromyard Builder's Failure: Serious Allegations.—George Lewis, builder, of Sherford-street, Bromyard, attended on Wednesday at the Official Receiver's office, Worcester, to meet his creditors. Mr. E. Cox (assistant Official Receiver) was in the chair, and Mr. A. J. Wise appeared for the debtor. The statement of affairs shows gross liabilities at £1,281, of which £660 are expected to rank for dividend, and assets £183. The Official Receiver's observations stated that the debtor entered into partnership with his mother and brother in 1892 to carry on the business of a builder of his father, who died at that time, the solvency of the business being doubtful. In 1895 the partners compromised with their creditors, whose claims amounted to £800. The estate was on that occasion assigned to a trustee under a deed which was not registered, and the creditors were settled with according to the measure of their resistance, the dividend ranging from 7s. 6d. in the pound to 15s., and one creditor by a subsequent payment received 20s. in the pound. The debtor resumed business on his own account without capital, and attributed his position to losses on contracts by reason of the rise in the price of material and want of capital. On September 23 he assigned to a creditor a book debt of £30 on the promise, he alleges, that the creditor would facilitate a private arrangement. He had no offer to make. Mr. Cox said the debtor alleged that the Rev. Benjamin Ickes, who in consequence had been asked to attend the meeting, had offered him £10 or £15 if he would write across a claim by debtor against Mr. Ickes for £92 9s. 11d. work done "settled." This the debtor had stated he had refused to do. The debtor had assigned £30 of the claim to a creditor, but as there appeared to be some doubt as to the validity of the assignment, a claim was made for the full amount. Mr. Ickes had repudiated any liability, alleging that debtor had already received more than he was entitled to for the work he had done to the new chapel. Mr. Ickes gave an absolute denial to debtor's allegation, which, however, he repeated at the meeting. Mr. T. Wilesmith accused debtor of having squandered the whole of the resources left him by his father, and said Mr. Ickes had proved a good friend to him, and had enabled him to put £100 in his pocket over the contract for the chapel. Mr. Wilesmith elicited that debtor had recently married the daughter of a late minister, and had borrowed £100 from the widow, who could hardly keep herself and had to take in lodgers to eke out a living. Mr. Ickes reiterated his denial as to the truth of debtor's allegation against himself, and said he had no need to make such a suggestion, as he owed debtor nothing. Mr. Cox pointed out that he must report the matter to the authorities, and if they ordered it to be sent before the judge it must go. The case is a summary one, and will be dealt with by the official receiver.

Ancient Light Dispute in the Whitechapel-road.—The case of Abrahams v. Schneider came before Mr. Justice Darling in the Vacation Court on Wednesday last on a motion by the plaintiff, the owner of premises in the Whitechapel-road, for an interim injunction restraining the defendant, until the trial, from building so as to obstruct the plaintiff's ancient lights. Mr. Alexander, Q C., who appeared in support of the motion, said that as no affidavits in opposition to the motion had been filed, he assumed the motion was practically undefended. Council for the defendant, however, stated that the reason his client had filed no evidence in opposition to the plaintiff's motion was that he found not the slightest proof throughout the plaintiff's filed evidence that his lights were ancient. Of course, if that could be established, the case could be at once dealt with. Mr. Alexander said he had not looked very carefully through the affidavits, but if, through an error, the statement that the plaintiff's lights were ancient (about which there was not the slightest doubt) was left out, he hoped his Lordship would give the plaintiff an opportunity of filing a fresh affidavit, in order that this might be made apparent. His Lordship: I have looked at the affidavits, and do not see that it is mentioned about the lights being ancient. You may file another affidavit, Mr. Alexander. Counsel for the defendant said that if his learned friend would satisfy his client's surveyor that his lights were ancient he would give an undertaking that the defendant would not proceed with his buildings without giving the plaintiff 48 hours previous notice of his intention to do so. If that offer were accepted, the motion he should suggest had better stand till the trial. Mr. Alexander said he would consent to this, and on these terms the motion was ordered to stand till the trial, the costs being reserved.

Action against the Army and Navy Stores for Alleged Infringement of Ancient Lights —The case of Symons and Co., Ltd., v. the Army and Navy Co-operative Society, Ltd., came before Mr. Justice Darling in the Vacation Court on Wednesday, on a motion by the plaintiff company for an interim injunction to restrain the defendant society, until the trial, from building so as to interfere with their ancient lights. From the statement of Mr. Everett, Q C., it appeared that the defendants were proposing to erect in Victoria-street, S.W., a building something like 80ft. high, which, it was alleged, would materially affect the access of light to a skylight on plaintiffs' roof on the south side. The learned counsel stated that the plaintiffs were cabinetmakers, and that the room lighted by the skylight was a work-room where a sufficiency of light was of great importance. His Lordship: Why do they not put a skylight on the other side of the roof facing north? Mr. Everett: We should not get any south light there. His Lordship observed that a north light was best for work of an artistic character. Mr. Everett replied that it had been held by law that a man was not bound to take damages for an infringement of ancient lights. In the result, his Lordship, without calling upon Mr. Alexander, Q.C., for the defendant, said he could not see that the skylight in question was of so much importance to the plaintiffs, because if it were they would put in another skylight on the other side of the roof. He did not think it was a case for an interlocutory injunction, and the motion would be dismissed. The case accordingly stands for trial.

Curious Action Against an Architect. — William Barratt, blacksmith, Coalville, sued George Harry Hewes, architect, of the same town, at the Ashby-de-la-Zouch County-court last week, for £30 damages alleged to have been sustained by him through defendant's negligence when acting as architect in the building of five houses at Coalville for plaintiff. Mr. Henry Deane appeared for plaintiff, and Mr. J. J. Sharp defended. Mr. Deane said that his client, being desirous of building five cottages in Coalville, employed defendant in 1894 as architect to prepare plans and specifications, upon which tenders were invited, and the lowest tender was that of Messrs. Hewes Bros., brothers of defendant, who was not a member of the firm then, but was now. The firm of Hewes Bros. got the contract, all the other contractors having submitted their tenders on the scale of the plan and specifications prepared by defendant. The builders undertook to complete the work according to the satisfaction of the architect. The amount of the contract was £750. The whole matter was settled up, and plaintiff understood that defendant had done all he undertook to do, and should have done. Defendant gave certificates from time to time as the work progressed, and money was paid by the plaintiff on the strength of such certificates. When, in the year 1898, an arrangement was being made by the plaintiff to sell the gable end of his cottages to the owner of the adjoining land, it was discovered by measurement that the height of the bedroom was not in accordance with the plan, there being a deficiency of a foot. This deficiency in brickwork, with other items, formed amount claimed. Wm. Barratt bore out the above statement. His Honour observed that he was of opinion that an architect, in his capacity as such, was an arbitrator between parties, and could not be sued in respect of his certificates. Mr. Deane held that he could be sued for negligence. The builders put in a foot less of brickwork on the whole length of the building than the owner had a contract for. Such a thing as that could not be an accident. His Honour observed that by a very little diligence the error could have been discovered. Plaintiff, continuing, said that after the discovery of the deficiency he saw defendant, who admitted that the height of the rooms was not quite 10ft. Witness said they were not quite 9ft., and defendant said that was the usual height, and they did not want to be any higher. Witness said, "Why put it on the plan then?" and left him, after telling defendant he was dissatisfied, and had not got what he had paid for. Defendant said he had. By Mr. Sharp: He could not say whether Mr. Hewes had any intention of defrauding him. Witness admitted that he left the dimensions of the cottages to defendant, after showing him one or two houses of the kind he wanted. He did not go through the plan and specification before they were sent to the urban council for approval, neither did he tell defendant he wanted 9ft. rooms. There was nó height mentioned. He went down to the buildings every day while they were being put up, but the brickwork was never mentioned in his presence, and he was never present when the bricks were counted. George Beckworth, of the firm of Beckworth and Sons, builders, Whitwick, said according to the plan the measurement of the bedroom was 9ft. 10in., and he gave a price for that. If he had known they were to be lower, his tender would have been lower, and the deficiency in height running through five bedrooms would make a difference in price. By Mr. Sharp: The claim of £15 in respect to this difference was reasonable. Mr. W. T. Hampton, architect, of Coalville, said there was a deficiency of 60 square yards of brickwork throughout the building. Mr. Sharpe, for the defence, attributed the matter to a clerical error. His Honour thought that an action could not be sustained, as plaintiff had paid £735 only on the faith of defendant's certificates, and the rest he had paid without the final certificate, but Mr. Deane argued that a charge of negligence could be sustained, and the case proceeded. Defendant said he should say he told plaintiff the rooms would be 9ft. He took good care not to give a certificate until plaintiff said he was satisfied. If he thought plaintiff had suffered any loss he would willingly pay him. The matter arose through a clerical error on his part. The case was adjourned.

The Limpsfield Building Case.—Leave to Appeal Granted.—On Wednesday application was made to Mr. Justice Darling, sitting as vacation judge, on behalf of the defendant in the case of Leveson-Gower v. Sewell, for leave to appeal from the order of his Lordship made last week granting an interim injunction to restrain the defendant from building on land at Limpsfield, Surrey, not in accordance with plans approved by the plaintiff's architect, in alleged convention of a covenant contained in a contract entered into between the parties. The case was reported in the Building News of last week. His Lordship granted the application.

Dumbarton Arbitration Case.—For ten days arbiters have been sitting in Glasgow in connection with the claims of Lord Blantyre and Mr. Claud Hamilton, of Cochno and Barns, for the land and water taken by the Eastern District of Dumbarton for the formation of a new public reservoir on the Kilpatrick Hills. The arbiters are Mr. Thomas Fenwick, C.E, Leeds, and Mr. James J. Davidson, Saughton Mains, Corstorphine. The various parties are represented by counsel from Edinburgh.

In re James Jillings.—The bankrupt was a builder and contractor, of Garden-street, Cromer. Gross liabilities, £2,395 14s. 4d.; expected to rank, £639 7s. 10d.; deficiency, £522 10s. 7d. Debtor, examined at the Norwich Bankruptcy Court last week, said he was a bricklayer by trade, and had saved about £50 eight years ago, when he started as a builder on his own account. Before he went into business some fourteen or fifteen years ago, he started in business as a bathing machine proprietor, his wife's aunt giving him rather more than £100. Soon after he started he went into partnership with a Mr. Davis. The business, which was a profitable one, was carried on until four years ago, when he sold out for £450. He paid £400 of that into his account, with the last £50 he paid off an account, and expended the rest in wages. When he started building he commenced doing the brickwork for Mr. Fox, and then went into the whole thing himself. He relied upon the men who drew up his estimates for him, but he had lost upon his contracts. Some architect or another generally prepared estimates for his large building contracts. In 1891 he made a heavy loss on a contract with Messrs. Payne and Bacon—some £200. He sold his share in the bathing machines because the bank told him he must reduce his overdraft. He sold out his paying business, and put the money into one that did not pay. He had kept no books of account, and he knew he had been insolvent for some years. In order to quiet his bankers his wife deposited some deeds of property belonging to her for his benefit. He had been subject to pressure for nine months, and two months ago Mr. Leggatt levied an execution on him. Since then the pressure had increased, Ranson and Sandford sued him, and then he came up to Norwich and saw Mr. Jewson. A meeting of creditors was called, and he was called on to find someone who would guarantee 5s. in the £. One of the creditors refused to accept it, and he thereupon filed his petition. The furniture in his house was his wife's; it belonged to her before they were married. The examination was closed.

WATER SUPPLY AND SANITARY MATTERS.

Hampton. — On Saturday afternoon, Sir F. Dixon-Hartland, M.P., chairman of the Thames Conservancy Board, formally opened at Hampton-on-Thames the new sewerage and sewage-disposal works which have been provided by the local district council. The district is a very flat one, and the Shone hydropneumatic system has been adopted. The outfall works are situated on the Hanworth-road, and occupy 20 acres of land. Here are the new disposal works, which are constructed upon the bacteriological system invented by Mr. W. J. Dibdin. The sewage, as it is forced to the outfall by the ejectors, is conducted to a series of bacteria beds for purification. After passing through an iron screen the sewage flows on to the upper bed until all the interstices between the clinkers of which the bed is composed are filled with sewage. When this is accomplished, the sewage is left standing in the coarse bed for about an hour, so as to allow the minute organisms, which cover every particle of the clinkers, to attack the organic matter contained in the sewage. The sewage afterwards flows on to other beds of finer clinker, and the resulting effluent is fine, clear water, which, according to analysis, is free from suspended matter, and is entirely devoid of offensive odour. It is claimed that the great advantages of this system are that no cost is incurred for chemicals, and that no sludge remains after the sewage is purified. The cost of the scheme has been £62,000.

CHIPS.

A memorial window of the late Mr. John M. Cook has been unveiled by the Lord Mayor at All Saints' Church, Upper Norwood. The subject is "Joseph Revealing Himself to his Brethren," and the window occupies the west-end of the church, lighting the gallery.

A Victoria Hospital is about to be built in Grosvenor-street and Falls-road, Belfast, and is estimated to cost £100,000. The architects are Messrs. Henman and Cooper, of Birmingham, and the quantities are now being taken out by Messrs. Stephens and Sons, Belfast.

A new Roman Catholic church is being built at Castlebar from designs by Mr. Walter G. Doolin, M.A., of Dublin. The chancel, side chapels, sacristies, and the double transepts, both north and south, are roofed, and the framed trusses for the aisle roofs are being set in position. The clerk of works is Mr. Cotter.

Foundation-stones have been laid of Magdalene Church, Donegall-pass, Belfast. The architect is Mr. S. P. Close, A.R.H.A., Donegall-square, and the builder is Mr. James Kidd. The church will be erected on the site of the old edifice, and the Gothic style has been adopted. It will accommodate about 700 persons, and the cost will be about £5,000. The building will be of local stone, with Scotch white stone dressings. The internal stonework will be Bath stone throughout, and the woodwork will be of pitch pine.

The gas committee of the Manchester Corporation has recommended the city council to apply to the Local Government Board for their sanction to the borrowing of £250,000 for gas extensions out of the sum of £500,000 which the council has already obtained power to borrow for the purpose.

Messrs. Pickford and Company are erecting on the site of their old premises in Pipe-lane, Bristol, a two-story warehouse and stable. The building is erected on strong concrete foundations in brick, and the floor above will be carried on stanchions and girders, the steel and ironwork being supplied by Messrs. Gardiner and Sons, Bristol. The stables will accommodate fifty horses, and the mangers are of a special make, and are supplied by the Carron Iron Company, Carron, Stirlingshire. The plans have been prepared by Mr. Thomas Scammell, architect, Bristol, and the work is being carried out by Messrs. Wilkins and Gosling, of the same city.

Mr. Thomas Kemp gave his employees a farewell supper upon his retirement from the old-established business of builder and decorator, which he has carried on at 237 and 239, Coldharbour-lane, Brixton, for the past 66 years. Thirty men sat down to supper, and Mr. Kemp proved a hearty host. Many present had spent years of service in the employ of Mr. Kemp—some for a period extending over 25 years. During the evening the health of Mr. Kemp and that of the new firm, Messrs. L. A. Rodwell and Son, were honoured.

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ILLUSTRATIONS.

NEW OPERA HOUSE, NORWICH.—HAMILTON HOUSE, VICTORIA EMBANKMENT.—ST. MICHAEL'S CHURCH, LINLITHGOW.—WELSH CONGREGATIONAL CHURCH, BOOTLE.—OAK SCREEN FROM PONTOISE.

Our Illustrations.

GRAND THEATRE AND OPERA HOUSE, NORWICH.

This theatre, which is to be erected in St. Giles's, Norwich, on the site of the old Norfolk Hotel, which has been pulled down for the purpose of such erection will occupy about two-thirds of the site, and will accommodate between 2,000 and 2,500 persons; the remainder of the site will be occupied by a first-class restaurant and buffet. The front main wall of the theatre will be set back from the main frontage of St. Giles's about 58ft., and will have a semicircular carriage sweep in and out, as shown on perspective. The theatre will be constructed on fireproof principles throughout, and the main front will be of white stone with richly-carved figures. Ample means of ingress and egress have been provided, and every modern principle has been employed in the designing of the building. The stalls and pit will be below, and the crush-room and circle will be upon a level with the street. There will also be an amphitheatre and gallery, and efficient saloon accommodation will be provided to all parts of the house. The cloak-rooms, retiring rooms, and sanitary arrangements will be of the most modern and up-to-date kind. The building will be lighted throughout by electricity, and the decorations, furniture, and equipment will all be carried out from the designs, and under the superintence of, the architects, Messrs. Ernest Runtz and Co., of Walbrook, E.C.

HAMILTON HOUSE.

This building, now in course of erection on the Victoria Embankment, is for the Employers' Liability Assurance Corporation, Ltd. Besides comprising the company's insurance offices, there are also several suites of private offices arranged for letting. The facings are of Portland stone. The principal staircase is of marble, and the whole of the interior is of fireproof construction. The builders are Messrs. Higgs and Hill, and the architect is Mr. William Emerson, Pres.R.I.B.A.

ST. MICHAEL'S CHURCH, LINLITHGOW.

These drawings were awarded a National Silver Medal at South Kensington. St. Michael's, Linlithgow, is one of the most important ancient parochial churches in Scotland, a considerable portion of it dating as far back as James III., but many alterations and additions were made in the early part of the 16th century. Until a comparatively late period the tower, instead of terminating in the four corner pinnacles, supported two cross arches forming a crown or lantern like that on King's College, Aberdeen. Our illustrations include view, plans, section, elevation, and details to a good scale. The church has recently been restored and a new vestry added. Mr. D. McKay Stoddart is the author of these drawings.

WELSH CONGREGATIONAL CHURCH, BOOTLE, LIVERPOOL.

This church has recently been completed at a cost of £1,600, including all fitments, heating, and ventilating. The seating accommodation is for 300 persons, and a schoolroom attached for 180 more, making a total of 480. The schoolrooms and church can be (where and when occasion requires) turned into one by means of a revolving division. The seats are of pitch-pine, the windows of leaded quarry glass, the walls of brick with stone dressings, roofs covered with slates; there is also a caretaker's house of seven rooms. The contractor was Mr. Geo. E. Johnson, of Bootle, and the architect Mr. Owen Roberts, of Moorfields, Liverpool.

CHIPS.

The work of restoration at Exbourne Church, Devon, described in our issue of the 6th inst., p. 438, was carried out by Mr. Richard Petherton, of Hatherleigh.

The Primitive Methodists of Shirebrook, near Mansfield, are about to erect a new chapel at a cost of about £1,200, from designs by Mr. J. Perkin, architect, of Shirebrook and Leeds.

The warming and the ventilation of Gnoll-road Congregational Church, Neath, have been placed in the hands of John King, Limited, engineers, Liverpool.

The Leeds Corporation Waterworks Committee let, on Friday, a contract for the new steel 24in. main across South Accommodation-road Bridge to Messrs. Piggott, of Birmingham. This will couple up the new mains already laid from the new Harehills Reservoir to Hunslet, where there are many large works, and will greatly augment the supply and pressure in the York-road and Hunslet districts. The tender of the Staveley Coal and Iron Company for casting a new 18in. main, to be laid from the new engines at Headingley to the Moortown Reservoir, was accepted. This is the first step towards supplying Shadwell with water.

The Paris, Lyons, and Mediterranean Railway Company, headquarters at 88, Rue St. Lazare, Paris, has undertaken the construction and operation of an electric railway between Fayet and Chamounix, at the foot of Mont Blanc. The line is to be in operation within twenty months. Power is to be furnished by the River Arve. The cars are to be automobiles, each supplied with its own dynamo. The contract for building the road proper and providing the water power has been divided into two parts and awarded to Gagner and Frères, of Annecy, and Richard and Meynard, of Avignon.

On Saturday morning, Charles Sadler, aged 20, of Noho-street, Bolton, a labourer in the employ of Messrs. Hick, Hargreaves, and Co., sustained fatal injuries through the collapse of a scaffold. He fell a great distance, and his skull was fractured.

The foundation-stone of the Roman Catholic church of St. Kieran was laid last week by the Bishop of Ossory in the village of the same name, some five miles from Birr, King's County. The architect is Mr. W. H. Byrne, of Suffolk-street, Dublin, and the cost will be about £4,000.

The Terriss Theatre at Rotherhithe was opened on Monday last. It seats over 2,000 persons, and has been built from plans by Mr. W. G. R. Sprague. The exterior is of red brick, with a free use of York stone for dressings, and the internal decorations are Louis Quatorze in style. Mr. Walter Wallis, of Balham, was the contractor. We illustrated the theatre in our issue of April 21 of the present year.

On Saturday last the new John Rylands wing of the Manchester Warehousemen and Clerks' Orphan Schools, Cheadle, Hulme, was formally opened. The architects were Messrs. W. and G. Higginbottom, Manchester, the contract being carried out by Messrs. Burgess and Galt, builders, of Ardwick, at a cost of £8,200.

A fire occurred on Friday in the joinery shop and timber-yard of Messrs. Micklewright, builders, of John-street, Crewe. The local fire brigade finding it impossible to save any of the premises, directed their attention to the saving of the Welsh Presbyterian Church, which was in imminent danger. The fire practically burnt itself out. The fire is supposed to be the work of an incendiary, and this is the sixth attempt within a short period on the same premises. The damage is estimated at £1,000.

A new Primitive Methodist Church, Station-road, March, was opened the other day. The chapel is 63ft. by 38ft. There is also a new schoolroom adjacent at the back, in addition to classroom and offices. The seating capacity of the chapel is 350, while the school will accommodate an additional 150. The builders were Messrs. Hipwell and Co., of Wisbech, and Mr. R. Rust, of March, whilst the architects were Messrs. Kerridge and Sons, of Wisbech. The total cost has been £1,200.

COMPETITIONS.

Edinburgh and Midlothian County Buildings.—In our announcement of the result of this competition last week, p. 476, a printer's error occurred, which Mr. A. E. E. Asher, the clerk to the County Council, has asked us to correct. The third premium of £50 was awarded to "Midlothian," the joint production of Messrs. McArthy (*not* McArthur, as published) and Watson, 25, Frederick-street, Edinburgh, and Mr. George Watson, 4, Hope-street, Edinburgh.

New York.—The execution of the New York Custom-house has been definitely awarded to Mr. Cass Gilbert, formerly of St. Paul, Minnesota, but now established in New York.

Norwich.—The Board of Management of the Norwich Savings Bank have awarded the premiums for the three best designs in order of merit in the competition for plans for the new banking premises in Red Lion-street, which was open, it may be remembered, to practising resident architects of Norwich and Norfolk. Some seventeen architects lodged sketch designs, a number submitting in addition alternative plans and elevations. Many of the designs were of high order, and exhibited considerable taste and skill. Messrs. G. J. and F. W. Skipper, of Norwich, who were placed first, have been commissioned to carry out the work, the other premiums being awarded to Mr. A. S. Hewitt, of Yarmouth, and Mr. Herbert J. Green, of Norwich.

Washington, D.C.—The new Department of Justice building, in Washington, is to be designed by Mr. George B. Post, of New York; the design by Messrs. Price and Aiken being placed second, while that by Messrs. Warren and Wetmore was placed third by the jury.

Whalley Range, Blackburn.—The new Presbyterian church at Whalley Range will be built upon land at the rear of the existing schools. It is of Gothic design, with mullioned tracery windows, its principal exterior features being the large north window and side tower. It will be brick built, with stone dressings. The body of the church is planned in three bays, with gallery over the main entrance, no obstructing pillars, and two shallow transepts, the pulpit and Communion table end being hexagonally terminated, with organ at rear. There is a good double central entrance from Bangor-street, and side entrance from Troy-street, both leading to an ample vestibule 12ft. wide, with ladies' and gentlemen's cloakroom accommodation on either side, and staircase leading up to the gallery. The pulpit is centrally placed, the choir seats being grouped around it, and the Communion table in front upon a wide platform. The minister's and elders' vestries are situated at the back of the church, with the necessary offices; and two classrooms, each 20ft. by 13ft., are placed below. Accommodation is provided for 487 in the body of the church, 80 in the gallery, and 34 in the choir—a total of 601 sittings. The successful design is that of Mr. F. W. Dixon, of Manchester, that of Mr. F. J. Parkinson, of Richmond-terrace, Blackburn, being second, and that of Messrs. Butt and Duncan, of Rochdale, third. The cost of the church is estimated at £4,000.

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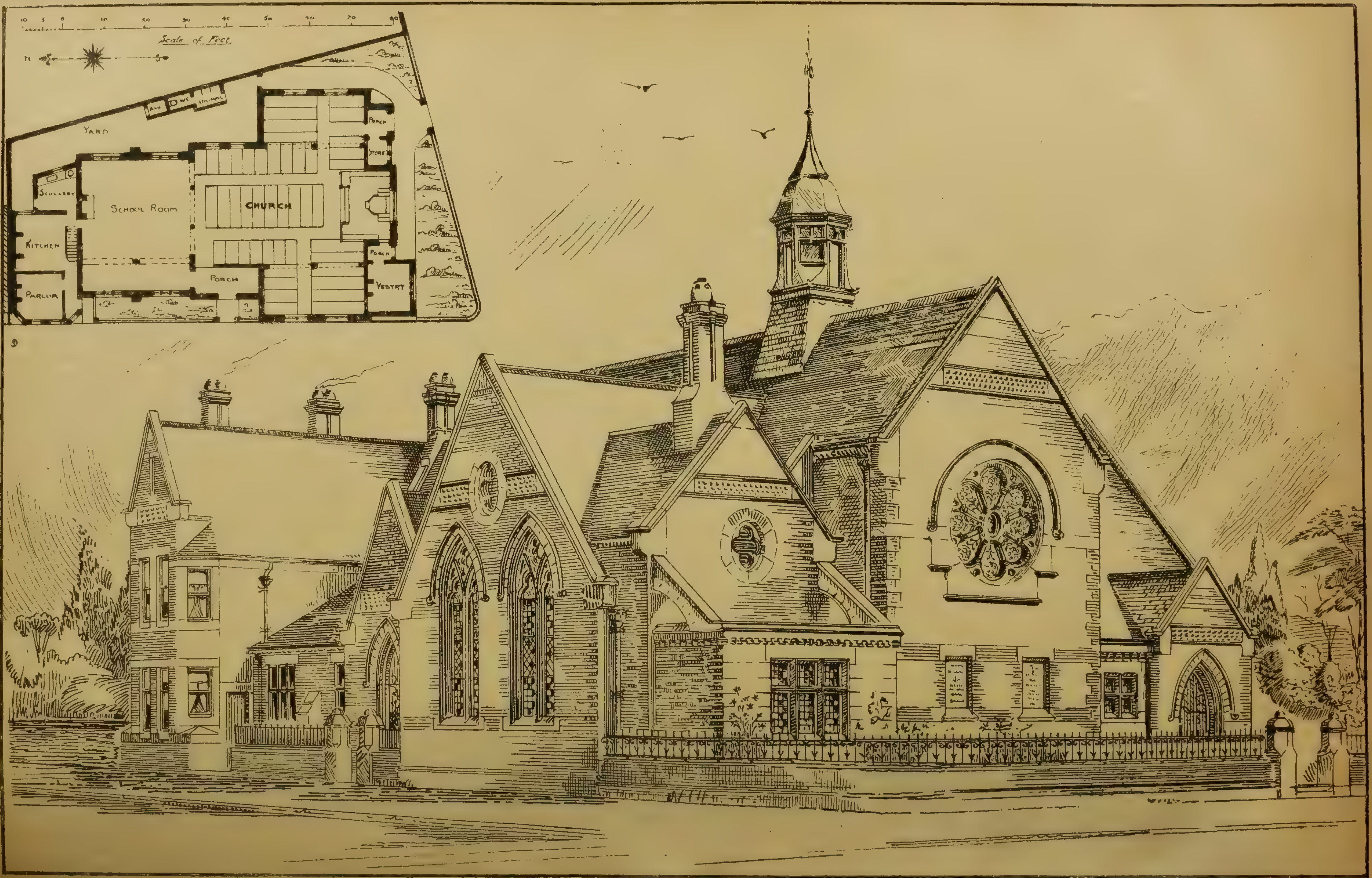
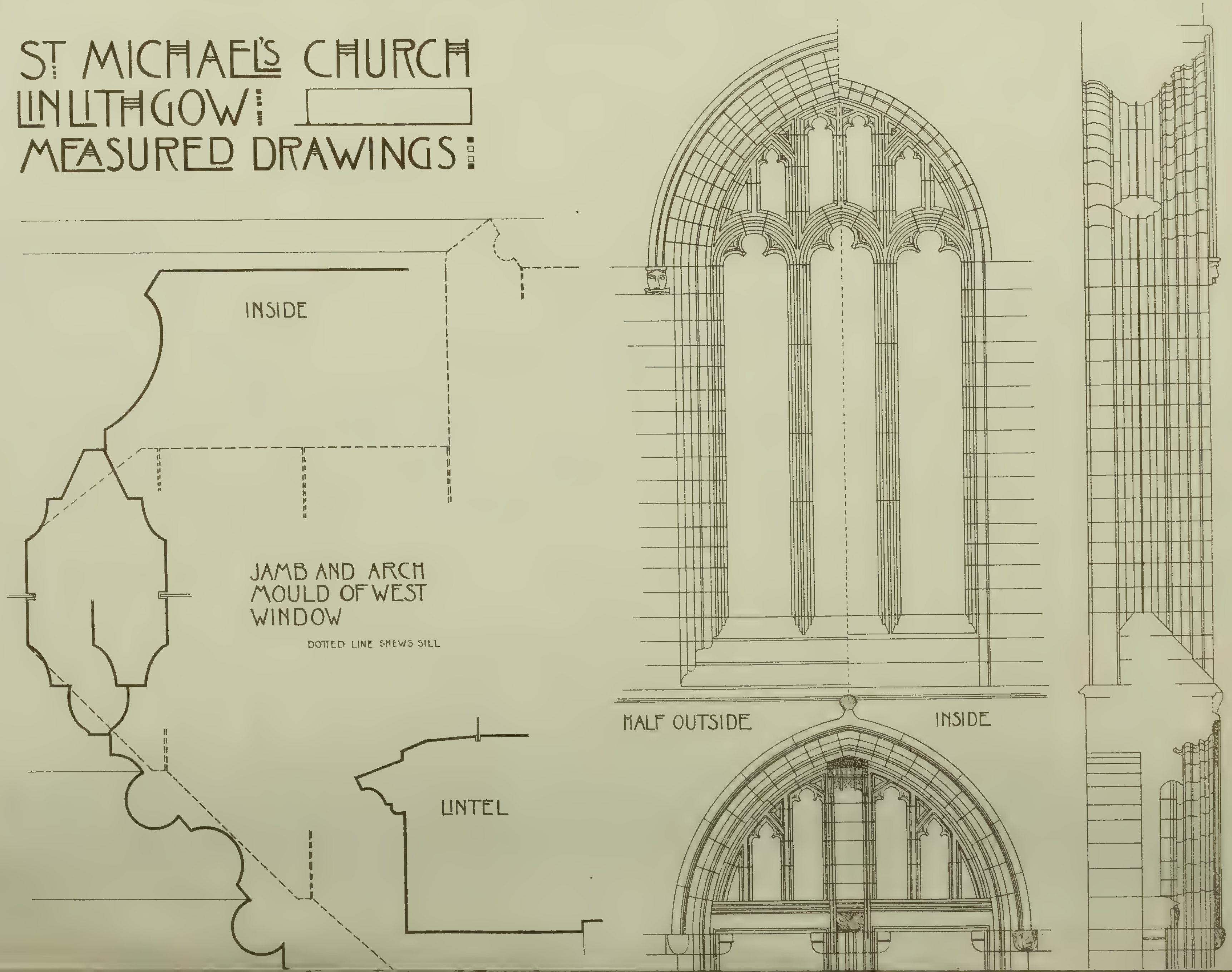
The Mayoress of Halifax formally started on Friday two turbines which have been erected at the Corporation electricity works. They are of 400H.P. each, and have been supplied by the Hon. J. Parsons, of Newcastle, at a total cost of £7,000. It is intended to use them for the tramway service. The chairman of the Electricity Committee (Ald. Woodhead) stated at the proceedings that the enlarged premises would give accommodation for machinery equal to 25,000H.P., in place of the existing 2,500H.P.

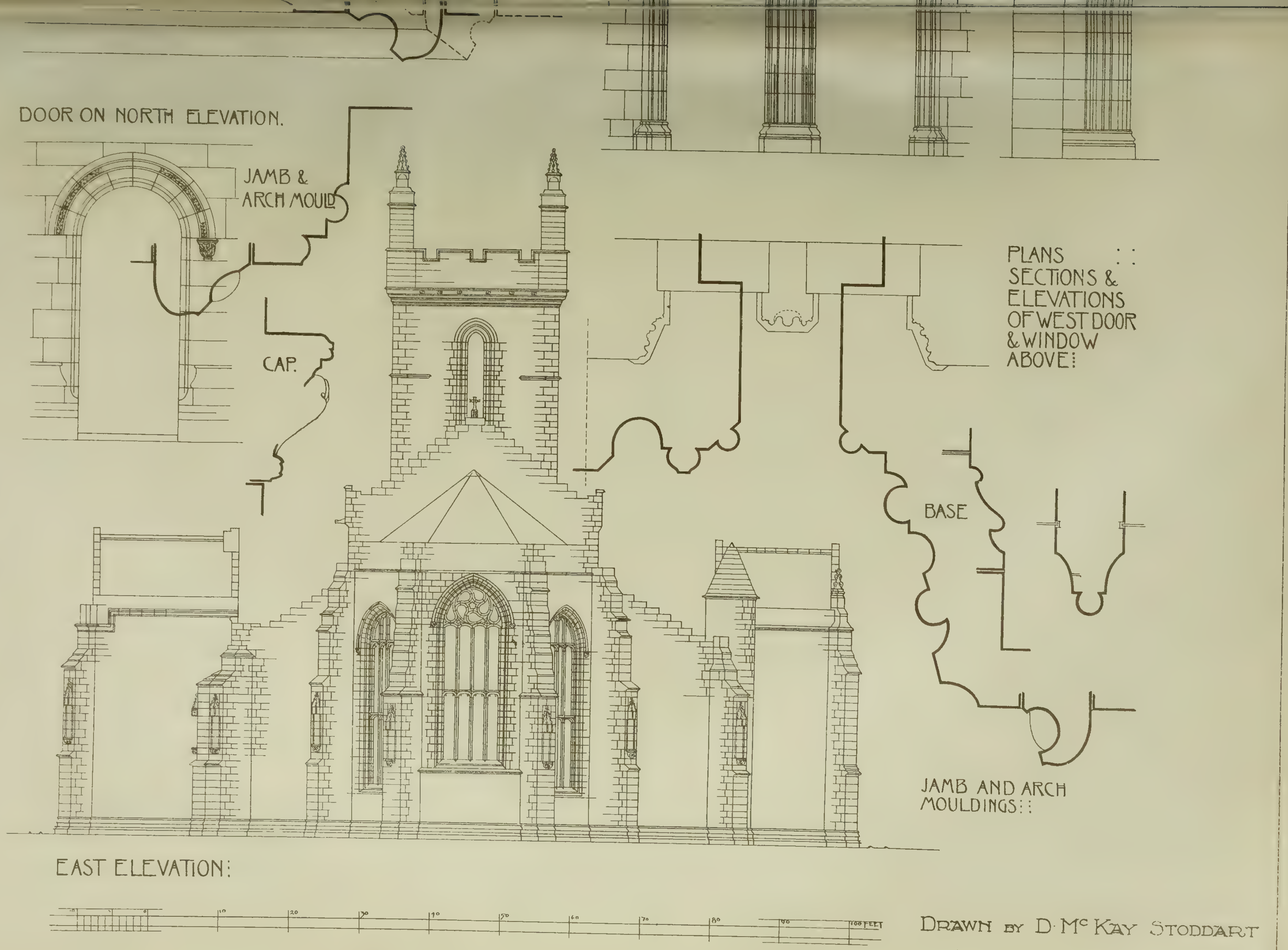
An inquiry by Col. W. L. Coke, Local Government Board inspector, was held at Marple Bridge, on Friday, into the application of the Hayfield and Mellor Rural District Council for sanction to borrow certain sums of money for purposes of sewerage works and sewage disposal in Mellor, a portion of the council's district. The clerk stated that £4,310 was the estimated cost of laying the mains in Mellor, connecting with the adjoining township of Ludworth, and sharing in the cost of the outfall works. The Local Government Board had, after a previous inquiry, issued a provisional order forming a joint sewerage board for Ludworth in the Glossop Dale Rural District Council's district, and for Mellor in the Hayfield Rural District Council's area. Mr. Henry Bancroft, engineer, explained the proposed sewerage scheme for Mellor. No opposition was offered.



WELSH CONGREGATIONAL CHURCH, MARSH LANE, BOOTLE.—Owen Roberts, *Architect.*

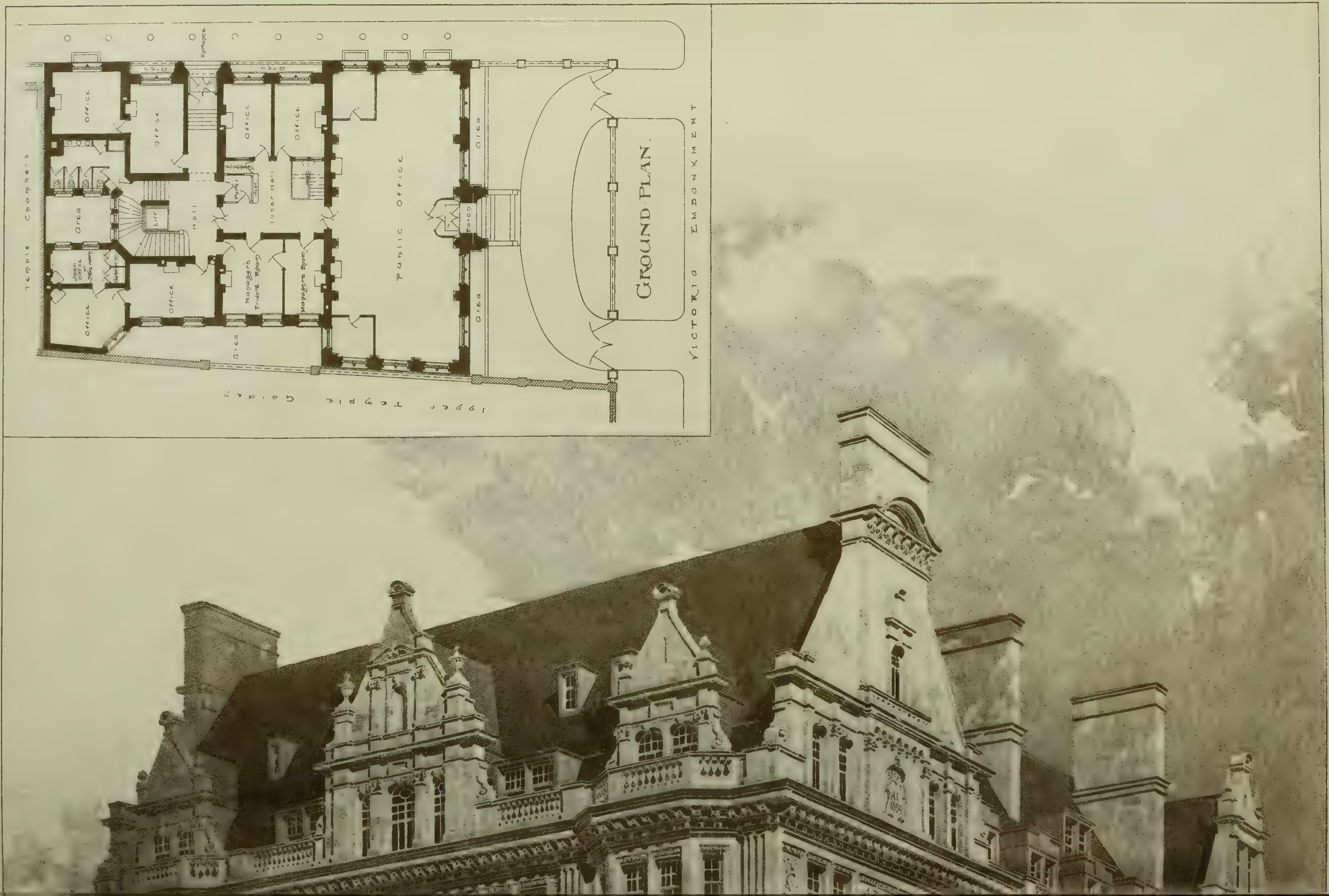
ST. MICHAEL'S CHURCH
LINLITHGOW:
MEASURED DRAWINGS:

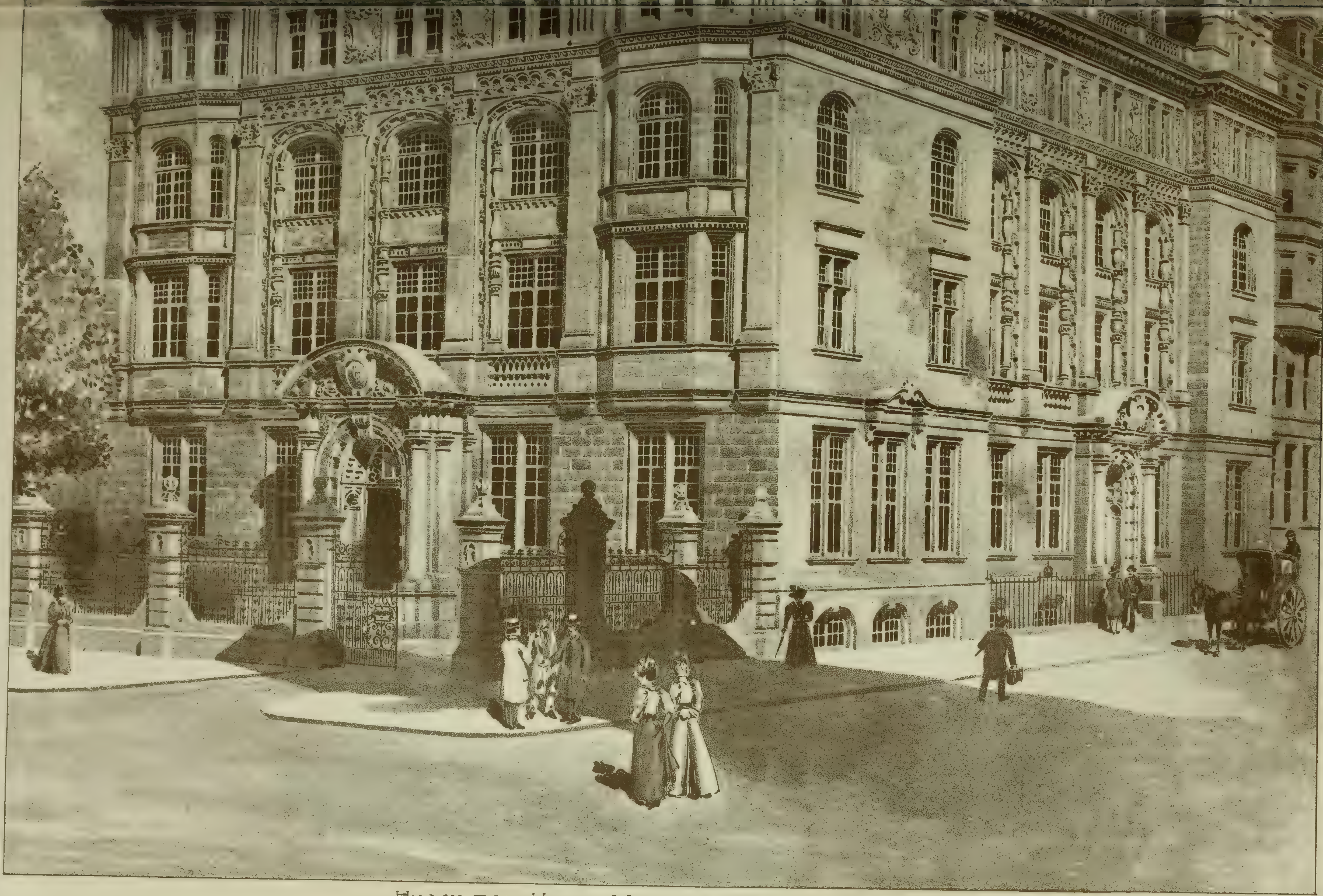




DRAWN BY D. MC KAY STODDART

· NATIONAL · SILVER · MEDAL · AWARDED ·

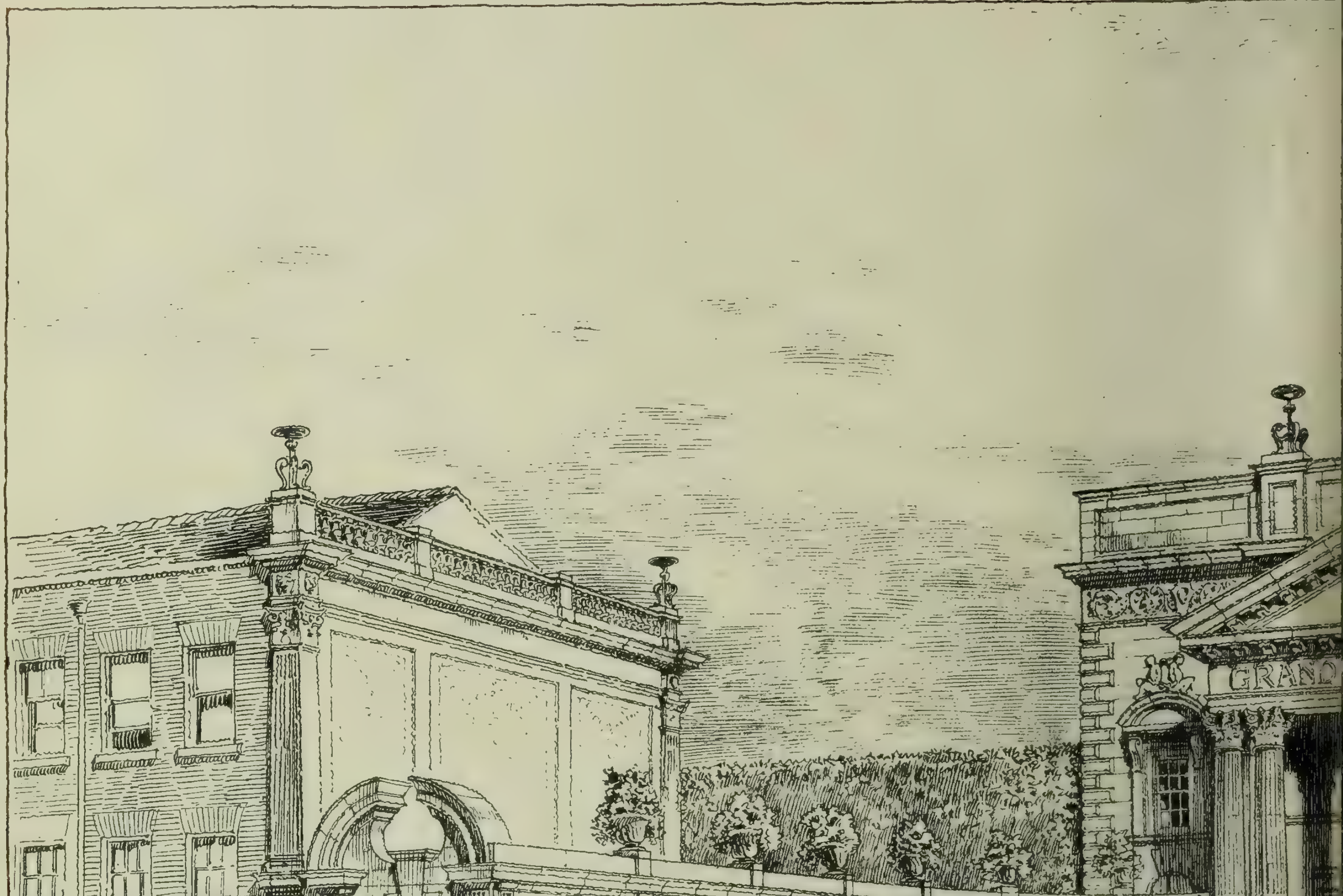

GROUND PLAN.
Victoria Embankment
Upper Temple Gardens
Temple Chambers
Entrance
Office
Office
Office
Office
Office
Office
Public Office
Porch
Area
Area
Area
Area
Area
Upper Hall
Hall
Lift
Porter
Seat
Telephone
Manager's Private Room
Manager's Room
Small Office or Store room
Cupboard



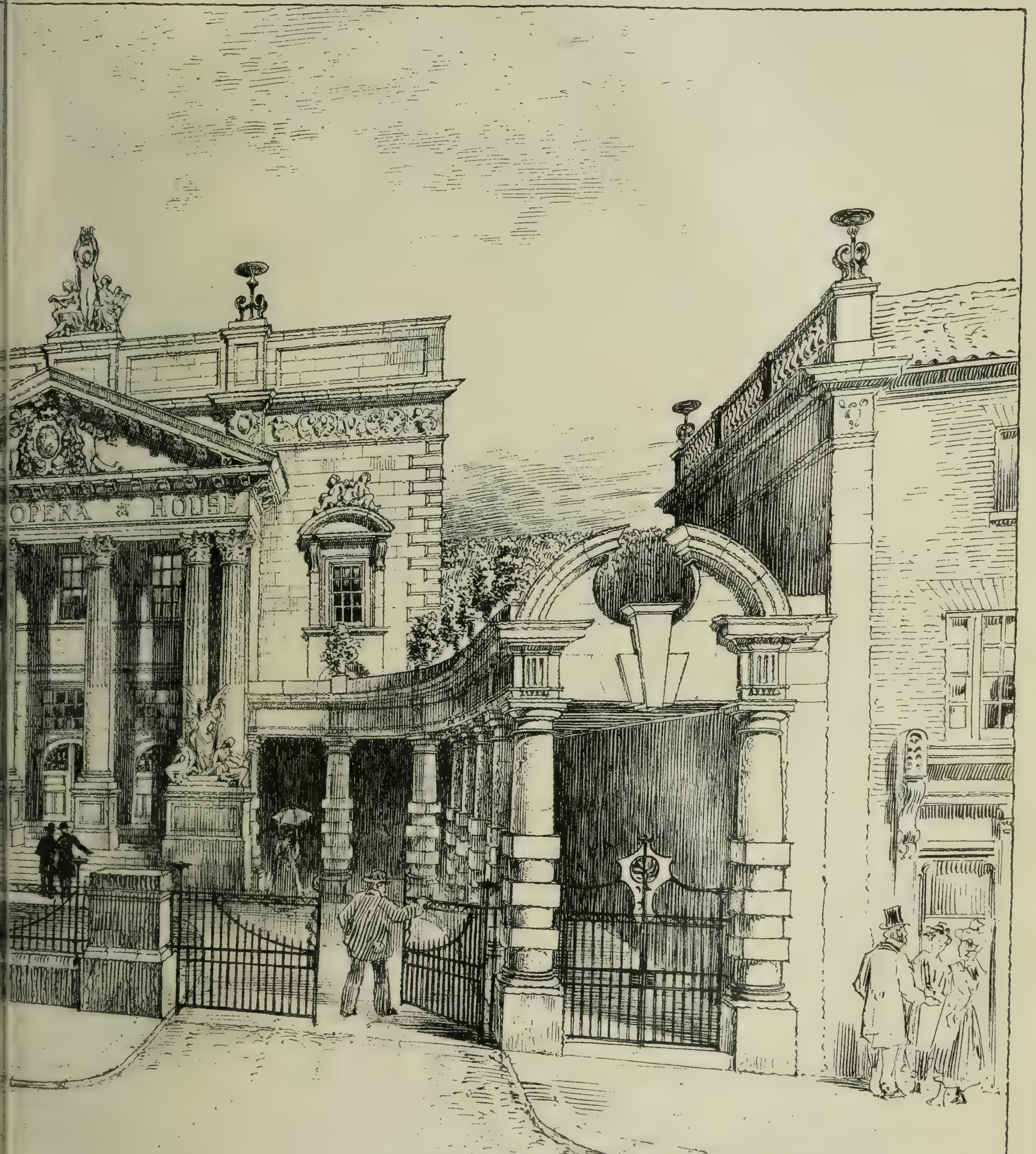
· HAMILTON HOUSE VICTORIA EMBANKMENT ·

ERECTED FOR THE EMPLOYERS LIABILITY ASSURANCE CORPORATION W^M EMERSON · PRIBA · ARCH^T

"PHOTO-TINT" by James Akerman, Queen Square, London.



·NEW OPERA HOUSE ·NO



VICH · ERNEST RUNTZ ARCHT.

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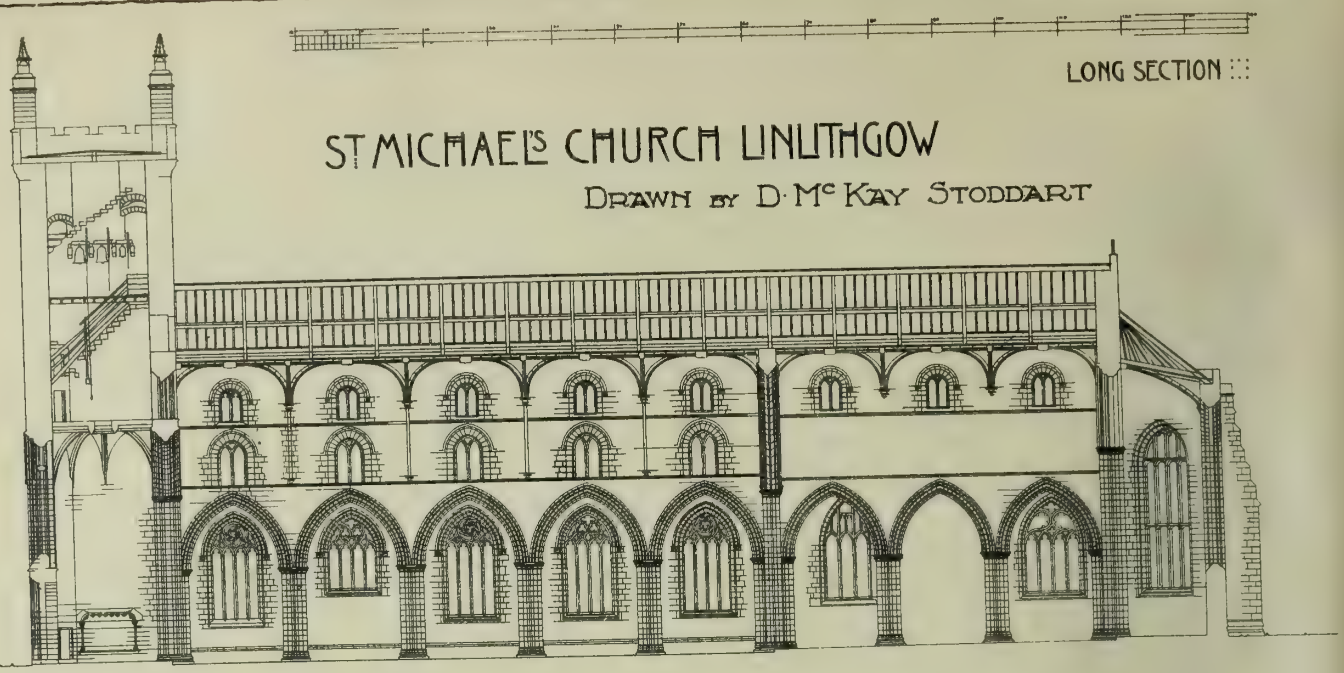

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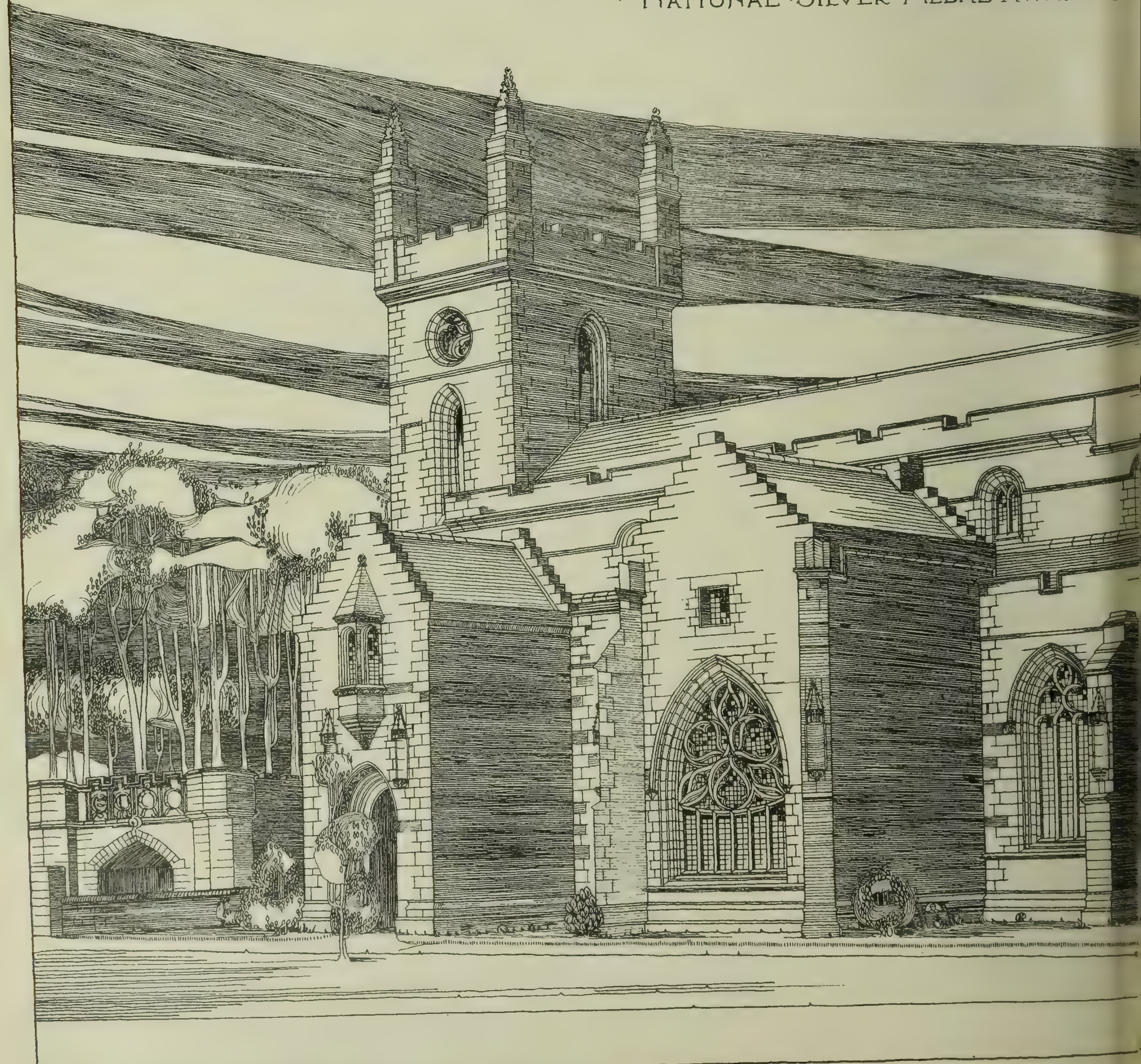

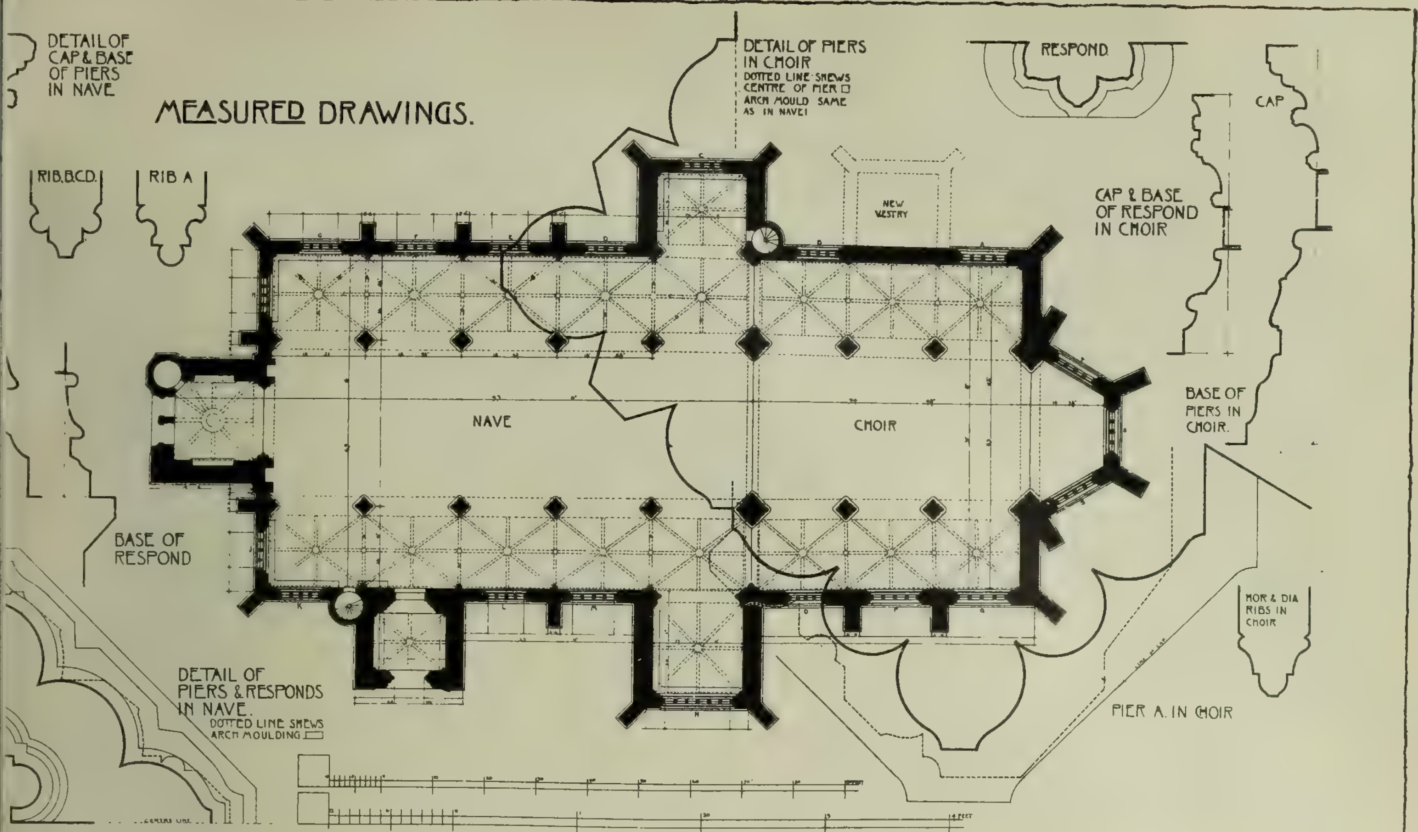
MEASURED DRAWINGS.
DETAIL OF CAP & BASE OF PIERS IN NAVE
RIB B.C.D.
RIB A
BASE OF RESPOND
DETAIL OF PIERS & RESPONDS IN NAVE.
DOTTED LINE SHEWS ARCH MOULDING
DETAIL OF PIERS IN CHOIR
DOTTED LINE SHEWS CENTRE OF PIER
ARCH MOULD SAME AS IN NAVE
RESPOND
CAP
CAP & BASE OF RESPOND IN CHOIR
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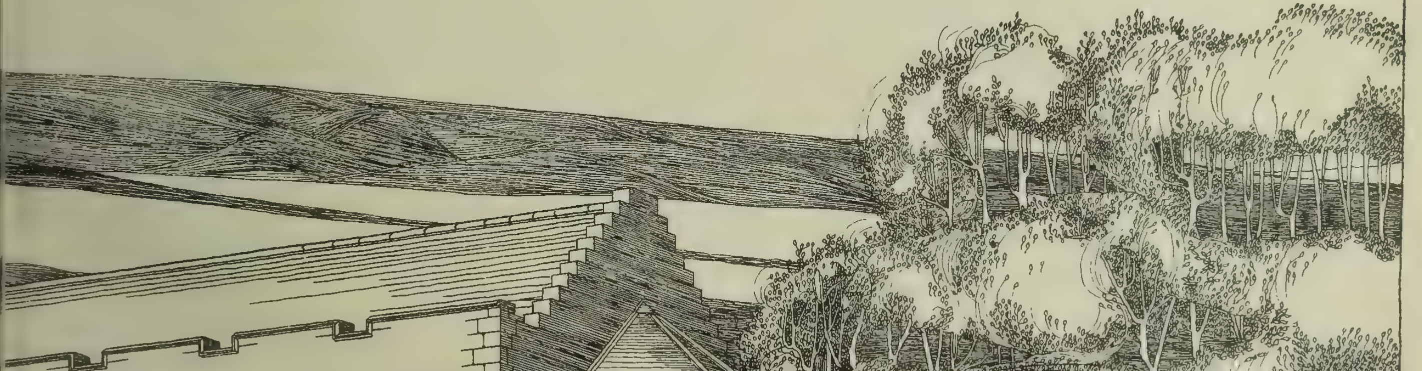
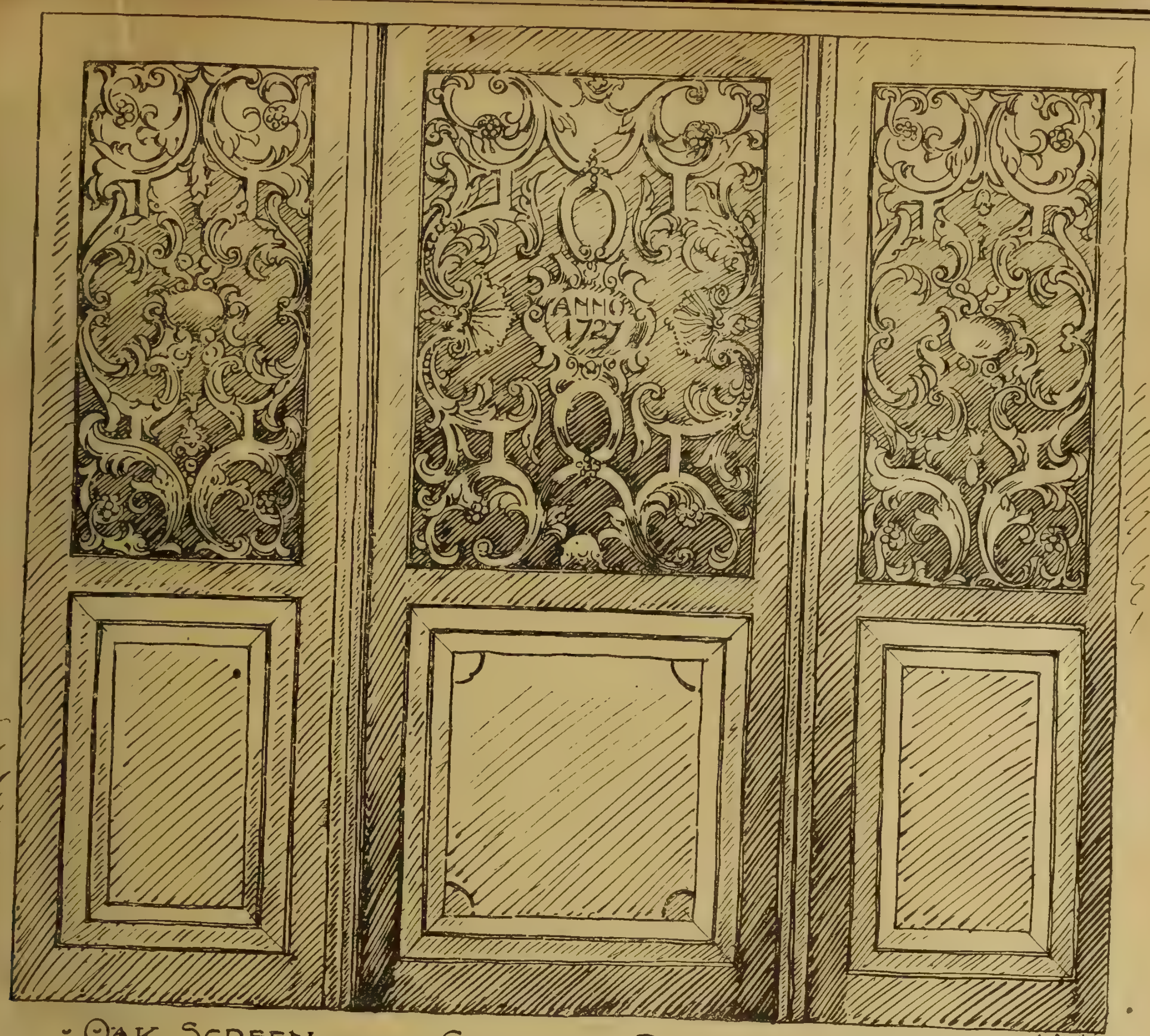


Photo-Lithographed & Printed by James Akerman, 6 Queen Square, W.C.



- OAK SCREEN FROM A CHURCH IN PONTOISE LOUIS XV PERIOD -

LOUIS XV. SCREEN.

THIS Screen has recently been added to our national collection of woodwork at the South Kensington Museum. It has three leaves and is of oak, the upper panels of which are most gracefully and delicately carved with scrolls and foliage. The centre leaf contains a cartouch being the date "Anno 1727." This graceful and uncommon piece of work comes from a church in Pontoise.

CHIPS.

The beautiful parish church of Northop—built by Margaret, Countess of Richmond, mother of Henry VII., who also built about the same time Mold Church and the elaborate building over St. Winefride's Well at Holywell—is about to be enriched by two interesting memorials. One will take the form of a stained-glass window, and the other will be a mural tablet.

A stained-glass window has been erected in St. Maurice's Church, York, in memory of the late Mr. William Routledge, who died on the 26th April, 1891. The subjects set forth are "The Sower and the Reaper," and the work has been carried out by Mr. Thos. Curtis, London.

The new junior school buildings of Bedford Grammar School, and the considerable extensions of the laboratories and gymnasium, together with a new pavilion—erected in the playfield as a memorial to the late Mr. H. Cross, a master in the school, who died on the Atbara last year in the Soudan Expedition — were opened by Viscount Peel on Friday.

Thursday in last week being Founder's Day at Harrow was chosen as a suitable occasion to uncover the reredos which has been placed in the school chapel in memory of Dr. Vaughan. It has been provided by a subscription got up among old Harrovians.

The south wall of the church of St. Mary Magdalene, Chulmleigh, having become dangerous in consequence of defective foundations, the trustees of the Chulmleigh Church Lands Charity called in Mr. E. H. Harbottle, F.R.I.B.A., of Exeter, to report on the same, and prepare plans for remedying the defect. Mr. Harbottle found that the wall ought to be taken down and rebuilt, and the tender of Mr. William Parsons, builder, of Chulmleigh, was accepted for the work. The foundation-stones were laid on Friday last.

The Manchester and District Branch of the Auctioneers' Institute of the United Kingdom has been successfully inaugurated at Manchester. An influential and representative committee was elected.

The memorial-stone was laid on Friday of dwellings for the working classes in James-street, Devonport, which are being erected for the corporation of that town on a site formerly occupied by slums. The whole of the ground is not yet cleared, and the present contract applies only to two blocks of houses to be erected. The houses are to be built in flats, and when the whole scheme is completed accommodation will be given for 141 persons. Facing Catherine-street will be three shops. There will be 23 two-room dwellings and 18 three-room dwellings. The present two blocks will provide accommodation for 82 people. The remainder of the scheme will be proceeded with as soon as the rest of the properties are acquired. Mr. J. F. Burns is the architect, and Mr. S. Roberts, Plymouth, secured the contract for building the houses, his tender being about £8,000.

A partnership has been arranged between Mr. Percy T. Runton, architect, of Hull, and Mr. W. E. Barry, architect, of Scarborough, which will be carried on under the style of Runton and Barry, at Hull and Scarborough.

Proposals are now before the Government of India for the reorganisation of the office establishment in the Forest Department. The proposals involve in all the Provinces an increase over the present scale of about £6,000 a year.

Two new schools for boys and girls respectively were opened at Wigton, Cumberland, on Wednesday week, by Lord Muncaster, Lord Lieutenant of the county, and Mr. J. W. Lowther, Chairman of Committees in the House of Commons. They both owe their origin to developments of the Wigton Grammar School, which was founded early last century.

The committee formed for the purpose of erecting a suitable memorial in Waterlow Park, Highgate, to Sir Sydney Waterlow, the donor of the park, have decided that it shall take the form of a bronze statue of Sir Sydney on a granite pedestal, and have commissioned Mr. Taubman, sculptor, to execute the work. The statue will probably be erected on the lawn in front of Lauderdale House.

The Jubilee clock tower for Maidenhead is now in a fair way to be carried out, and the order for the clock, which will have four 3ft. 6in. dials, and strike the hours, has been given to Messrs. John Smith and Sons, Midland Clock Works, Derby. This firm has also just erected a large chiming clock at the Guildhall, Newcastle-on-Tyne.

The cable-car routes in Edinburgh from the Tollcross station to Pilrig *viâ* Princes-street on the one hand, and the Braid Hills on the other, were inspected on Friday by Sir Francis Marindin, of the Board of Trade. The inspection was of a satisfactory character, and it was intimated that the routes will be open for public traffic next week. Mr. W. M. Colam was the engineer, and Messrs. Dick, Kerr, and Co., the contractors. The track length inspected is approximately 8½ miles long, and when the section is open for public service there will be 14½ miles of cable tramways at work in Edinburgh.

On Thursday in last week the Earl of Jersey and Col. Boughey sat at the town-hall, Wolverhampton, to hear an application under the Light Railways Act for power to construct a light railway from Wolverhampton to Bridgnorth. It was stated that the line will be 15½ miles in length, or, including the double junctions at either end, 18 miles. The engineer estimated the cost at £312,000.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.*

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—T., Ventnor.—B. of G.—C. C.—R. J. and Co.—Porlock.—T. Jackson.—G. G. and Co.—W. and Son.—Stipple Jack.—An Exhibitor.—L. T. Martin.—R. Shaw.—Student.—D. R.—J. S. P.

R. W.—Better be careful! If there are many more letters like that knocking about, one of these days, when the evident attack of softening on the brain you are sickening for supervenes, their production will certainly land you in a lunatic asylum.

Bear-leader.—So it was said at the time. We published a report of the case the same week, and perhaps may refer to it one of these days when we write his obituary notice.

Cecil J.—We are all-round journalists here, as most people know, and not simply the editor of the leading architectural paper, and we remember our own assurance years ago, when we were green; but, really, dear boy, it *is* a bit too thick to ask us to make you our special correspondent, assuring us that you can "give us *facts* about competitions, new buildings, &c., in your town, and we can easily put in the architectural terms—*Doric, Gothic, Ionic, and so on!*" Your right place is in the Transvaal just now, sending home headlines for the evening shockers!

Practitioner.—Simply middlemen. You would do far better with people like Rashleigh Phipps and Co., or G. E. Cockburn. The people you name simply put their electrical work out.

S. S. T.—Yes, but prices are high all round! The nearest good maker is A. W. Itter, Fletton House, Peterborough. He supplies remarkably good common bricks, with a healthy absence of bats among them.

Hotel.—We should never put that lift in ourselves. R. Waygood and Co., or Archibald Smith and Stevens would be the firms for you.

P. Harris.—None better than Oakey's, kept by all decent shops. You can get flint or garnet in stock sizes from 18in. to 48in. in width.

"BUILDING NEWS" DESIGNING CLUB.

Scotland. (There are premises on each side of the bank, so that no windows can be obtained in its gables.)—La Poupee. (No side elevations are required save the back portion, if any, and this will show probably in the section.)—L. S. D. (The façade should bespeak the purpose of the building, but breadth of design is to be preferred to elaboration of detail.)

Correspondence.

PLANS FOR URBAN DISTRICT COUNCILS.

To the Editor of the Building News.

Sir,—In the ordinary course of our business we have submitted to an urban district council plans for their approval for buildings to be erected which in every respect comply with their by-laws except (as they state) in one detail only.

The by-laws state that the plans shall be submitted in duplicate, and that one set for the retention by the council for reference shall be "on tracing cloth or other suitable material." Our plans are in the form of what is known as "the sun blue prints," the paper being of the usual quality supplied by the stationers for this purpose. The council say that these drawings are not on "suitable material," and we shall be glad to have an expression of opinion from you on the subject.

This is, of course, obviously of great importance to the profession, inasmuch as should all local authorities reject this class of plan, stating it to be "unsuitable material," the expense of preparation of plans where two or more copies are required will be largely increased.

Thanking you in anticipation, we are, &c.,

Douglas Young and Co.

[The point is worth discussion. We fancy the council can insist, but shall welcome other opinions.—Ed.]

FORFAR FEVER HOSPITAL.

Sir,—The committee for the above have now selected their architect, and as there are a few points in connection with this competition which we think will in a way interest your readers, we send you the following particulars for publication.

In January last the Dundee and Forfar District of the Forfar County Council advertised for competitive designs for an isolation hospital (24 beds) to cost £4,500, not including furnishings, painting, laying out of ground and planting, also architect's, measurer's, or inspector's fees, but including boundary-wall around the ground, about 780 lineal yards in length.

Thirty-four designs were submitted in March, and Mr. Morham, city architect, Edinburgh, was appointed assessor. The design submitted by us was awarded the first premium. On June 6th we received official intimation to this effect. The probable cost of our design, as stated in our report, was £8,748; but at a subsequent meeting of committee several parts of the design which they thought might be dispensed with were eliminated, thus reducing the cost for stone buildings to £8,000.

While negotiations were proceeding between the committee and ourselves, the committee received from Mr. Cappon, architect, Dundee—we notice Mr. Cappon is a F.R.I.B.A.—the following letter:—

> "Understanding there is a difference of opinion regarding cost of my design for above (Dundee and Forfar Joint Hospital), I write to say that, if desired, I will be pleased to check the accuracy of my figures by preparing contracts and getting tradesmen's offers for the different works. Should my estimates prove to be wrong, I would not expect any remuneration for the trouble and expense involved. Kindly lay this offer before the first meeting of your committee, and oblige."

Mr. Cappon's estimate was £5,400.

It was stated at a meeting of the Forfar District Committee by Mr. Anderson, C.E., sanitary inspector, "that the assessor before he saw the plans had indicated that such a building as they required could not be put up at less than something like £8,000, and when the plans had come to him he thought, on the whole, that selected by the assessor could be erected nearer to the estimate than any of the others."

On hearing of Mr. Cappon's action, we communicated with the committee, laying the facts clearly before them, and pointing out that surely the authors of the first premiated design were as able to carry out the work as cheaply, consistent with efficiency, as the author of the design placed third.

Mr. Cappon was asked to prepare schedules and take in offers, and subsequently was appointed architect for the new buildings. The clerk, in a letter intimating the decision of the committee, states: "Mr. Cappon, *at the suggestion of the committee*, issued schedules to contractors, with the result that he has got offers for the erection of the hospital, the gross amount of which come to just about £3,000 less than your estimate."

It is unnecessary for us to make any comment on Mr. Cappon's action, further than to state that in our opinion it is most contemptible and unprofessional. The rest of the estimate obtained by him does not appear to us to justify the action of the committee in appointing him architect for the buildings.

If the whole buildings are to be finished "with first-class materials and good workmanship" as stated, how is it possible to do it at the sum stated by Mr. Cappon?

We understand that the winner of the second premium (Mr. Cullen, F.R.I.B.A., Hamilton), although asked, refused to take estimates in the speculative manner offered by Mr. Cappon, as the only fair and gentlemanly way, in the case of doubt, was to submit the plans to a measurer of experience.

Thanking you in anticipation, we are, &c.,

McArthy and Watson.

25, Frederick-street, Edinburgh,
October 17, 1899.

CHIPS.

At a meeting of the Chester Town Council on Wednesday a resolution was passed, by 19 votes to 10, in favour of taking over the undertaking of the Chelsea Tramways Co., Ltd.

Mr. C. E. Tritton, M.P., presided, on Wednesday, over a meeting of the executive committee, formed for the purpose of acquiring 42½ acres of beautifully wooded land, adjoining the present 86 acres constituting Brockwell Park. Mr. S. Horace Chandler, vice-chairman, submitted the terms of purchase which he had obtained from the owners—the trustees of the Blackburn estate. The committee considered the price reasonable, and resolved to proceed with their scheme.

A picture of the Queen's visit to St. Paul's Cathedral on the day of her Diamond Jubilee in 1897, which has been painted by Mr. A. C. Gow, R.A., on the commission of Mr. H. Clarke, a member of the Common Council, was formally presented by Mr. Clarke to the Art Gallery at the City Guildhall on Wednesday, and was received and unveiled by the Lord Mayor on behalf of the City Corporation. The picture, which was hung at the Academy this year, is hung at the eastern end of the main gallery, and represents the gathering on the steps of the Cathedral on the morning of June 22, 1897, with the Queen seated in her state carriage, attended by the Prince of Wales and other members of the Royal Family.

A new bacon factory at Devizes, Wilts, has just been erected by Mr. Henry Ash, of Devizes, for the Central Wiltshire Bacon Co., Ltd.

Mr. Henry Edwards, of Burton-on-Trent, has obtained the contract for the second block of houses to be erected by the Burton Artisans' Dwellings Company. The first block is nearing completion, and the formation of the street will shortly be proceeded with. The plans for all the buildings have been prepared by Mr. T. Jenkins, of High-street, Burton.

It is expected that Mr. F. W. Pomeroy's statue of Mr. Gladstone will be completed in sufficient time to enable it to be placed in position in the House of Commons before the commencement of the adjourned session in February next. The full-sized model was completed some time ago, and the figure is now being carved in marble.

In the Council Chamber, Newcastle-on-Tyne, Mr. W. O. E. Meade-King, Local Government Board inspector, sat to hear an application by the city council for leave to borrow £2,011 for street improvements. The town clerk (Mr. Hill Motum) and the city engineer (Mr. W. G. Laws) appeared to support the application on behalf of the council.

The majority of Mr. W. P. Lewis, jun., son of Mr. W. P. Lewis, builder and contractor, Hereford, was celebrated last week by a dinner at the Mitre Hotel in that city, to which about seventy friends and employees were present. Mr. Lewis presided, Mr. J. Parker, city surveyor, occupying the vice-chair.

The managing committee of the South-Eastern and Chatham and Dover Railway have just let the contracts for the widening of their lines between St. John's and Orpington. As soon as this work is completed there will be four lines of railway from Charing Cross to Orpington, a distance of fourteen miles out of London. The committee have also instructed their engineer to commence at once the alteration of Tonbridge Station. Contracts are already out for the building at Ashford of an entirely new station, with eight sets of lines and four platforms. The Chatham and Dover terminus at Victoria is about to be improved. The platforms will be relaid, and the network of lines rearranged.

Intercommunication.

QUESTIONS.

[11341.]—**Herring-Bone Work.**—There is a specimen of Roman herring-bone pavement in the Guildhall Museum, London. Would any of your readers kindly tell me where other examples of herring-bone work, dating from Roman times, may be found in Great Britain, or what books treat of the subject? The walls of Grenada, in Spain, contain a large amount of herring-bone work. Is it Spanish, Moorish, or Roman?—Canopus.

[11342.]—**By-Laws.**—One of the by-laws of an urban district council reads as follows:—"No building shall be erected on the side of any new street which shall exceed in height the distance from the front of such building to the opposite side of such street; nor shall the height of any building so erected be at any time subsequently increased so as to exceed such distance." Does this restriction as to the height of the building apply to a new erection in an *old* street? A new building is about to be erected upon the foundations of a building already in existence. It is proposed to take down the existing walls to the level of footing courses of foundations. Can an urban district council deem this a new building so as to insist upon the frontage being set back a distance of 3ft.?—J. O.

[11343.]—**Angles, Light and Air.**—Will someone kindly oblige by explaining the use of the angles 63½° and 52½° in light and air cases, as I understand they are used by the London County Council? I have referred to three or four textbooks, and looked through the London Building Act L.C.C. regulations, but cannot find any reference to the angles.—Provincial Surveyor.

[11344.]—**The Scissors Truss Roof.**—This kind of truss is often used over schoolrooms, small churches, and chapels. It consists of a pair of cross braces or ties, which connect the feet of the principals, and also a point about two-thirds up. Sometimes there is an iron bolt from ridge to intersection of cross braces. How should the braces be framed to the principals? Will halved dovetail connection do, or would it be better to use iron straps at the junctions with principals and braces? I have seen both methods used; but would like an opinion from some practical correspondent as to these points. Also whether the truss can be depended on for spans of 20ft. Sometimes I have noticed the principles have an iron tie-rod near the feet, implying that the truss is likely to spread. To my mind, the tie-rod renders the cross braces useless. I have seen also a wooden tie introduced a few feet above the springing, bolted through both principals and braces. Any suggestions will be of value.—Theorist.

[11345.]—**Vetropake.**—Will someone who knows inform me whether this sort of decoration is suitable for external work or decoration, and how it can be fixed?—A. G.

[11346.]—**Ants.**—At the present season many of the houses in London which are built on a sandy soil have the basements infested with swarms of small red ants. Everything that is brought to table is covered with them to such an extent that a positive nuisance results. Can you or any of your correspondents suggest any method of exterminating them, or greatly reducing their number?—Rowland Plumbe.

[We have found ordinary paraffin oil, plentifully applied in their haunts, the best remedy.]—Ed.]

[18347.]—**Protection of Adjoining Walls from Damp.**—I am erecting a villa, and my filled-up ground-line comes above the dampcourse of the adjoining owner's garden-wall. I should like to know if I am compelled to protect his wall from damp? I may mention the wall is damp in some places owing to his ground being above his own dampcourse.—S. E. B.

REPLIES.

[11336.]—**Architect's Duty to Pupil.**—"Anxious" is, I am afraid, only one complainant in a large number of cases. I should advise "Anxious" to persevere in his course, to try and supplement his work at the office by attending a class of building construction or practice, and to ask his master to allow him the necessary time for study. He may at least do well to ask his master questions about such things as levelling, and how to read levels. No master could refuse to explain. I can sympathise with "Anxious" if it is his misfortune to have been placed with a busy firm, who are too busy to teach a pupil, or so overbearing and important that they will not trouble. I have heard of such cases;—the only way is to respectfully ask principal to give you a little instruction in certain matters. Every architect who takes pupils is morally bound to instruct and explain as far as he reasonably can; but, of course, this obligation is considerably limited by the demands of business, and in many indentures there is no covenant to give private instruction.—An Architect.

[11339.]—**Oak Floor**—"Shrinkage" says he has laid an oak floor of dry stuff, and that owing to the heat from heating pipes some of the joints have opened. Of course they have! These are not the days of miracles, and it would be a miracle if they had not.—Harry Hems.

[11339.]—**Oak Floors.**—The question put by your correspondent "Shrinkage" is not complete. Probably he means "*What* is a 4in. by 1in. T. and G. laid on counter floor?" instead of "Which." A floor of this description is 1in. oak floor in 4in. widths, grooved and tongued, laid on a deal floor. Heat from heating-pipes would cause any joints to open.—X.

[11340.]—**Plaster.**—The width of a church or other building is usually taken to mean either the internal width in clear of plastering, or the total outside width. The question of "Student" would have been more explicit if he had said 37ft. *in the clear* inside. If this is what he means, the thickness of the plaster should be added to the thickness of the walls. If these are 3ft. thick, then 37ft. + 6ft. + thickness of plaster is the external width. Many builders take the width of a building as between the brick walls, the thickness of plaster being neglected, and this is the usual case with builders, unless the exact width in the clear is stated. As it only makes about 1½in., the difference is immaterial in large rooms. The dimensions of a room put on the plan ought of course to mean in clear of walls, or the clear width between them, allowance in this case being made for plaster.—Verax.

CHIPS.

The Theatre Royal and Opera House at St. Helen's, which was erected nine years ago at a cost of £13,000, was completely destroyed by fire early on Friday morning, the damage being estimated at £20,000.

The Parks Committee of Edinburgh Town Council have recommended the purchase of 94 acres of ground on the Saughtonhall Estate for a public park for the Dalry and Gorgie district of the city, at the price of £52,900.

The new block of buildings in Hatton-garden, to be used by the Liverpool Fire Brigade, will be formally opened on Tuesday, the 24th inst.

St. Leonard's Church, Shoreditch, was reopened on Friday night after restoration at a cost of about £1,200.

A new Congregational church was opened on Tuesday week at Otley. The new building occupies the site of the old one in Bridge-street. Its erection has cost about £7,000, and it will provide accommodation for 542 persons. The architects are Messrs. T. H. and F. Healey, of Bradford.

The Naval Commander-in-Chief performed the opening ceremony at the Royal Sailors' Rest, Morice Town, Devonport, on Friday afternoon. The old and inadequate premises have been pulled down, and rebuilt from the plans of Mr. H. J. Snell, of Plymouth, so as to provide much greater accommodation. The building is now of red brick, with Hanhill stone facings.

A new Presbyterian church was recently opened at Cushendall, Co. Antrim. It is constructed of stone, and is Early English in style. Mr. William J. Fennell, M.R.I.A.I., of Belfast, is the architect, and the builder is Mr. Hugh M'Cann, Ballymena.

Under the Housing of the Working Classes Act, the corporation of Aberdeen have erected eight dwellings, at a cost of £7,245, in Urquhart-road. The remainder of the ground acquired for this purpose (it was decided on Monday by the town council) is to be utilised for the erection of additional houses along Roslin-street and Park-road.

A wooden structure 60ft. high and 105ft. long at the Paris Exhibition buildings suddenly collapsed on Monday, and nine workmen were injured.

The London County Council, at its meeting on Tuesday, discussed at great length the proposal to apply for powers to construct an extensive tramway system under the Light Railways Act. Strong objection was taken by several members to the proposals of the Highways Committee, but they were in the end agreed to. The Council also resolved to employ Professor A. B. W. Kennedy as an expert adviser in regard to the equipment of an experimental portion of the Council's lines for electrical traction, and also as adviser in the endeavour to secure Parliamentary sanction to the light railway scheme.

The studio of the late Sir Edward Burne-Jones, at the Grange, West Kensington, has been hung with about fifty of his works, some unfinished, and will be open to students and the general public on Saturday and Sunday afternoons, from two o'clock till dusk, commencing on Saturday, Oct. 21. The entrance to the studio is in Liscar-terrace, West Kensington, and visitors will be required to sign their names in the visitors' book.

The section of double line between Polperro and Buck's Head, near Truro, was opened for traffic on Saturday.

An inspection was made by Mr. J. A. Brodie (city engineer of Liverpool) and other corporation officials, of the Walton electric tramway. A car proceeded from Lord-street, via Whitechapel, Scotland-road, to Spellow-lane, returning by way of Scotland-road, Dale-street, and Castle-street. Everything connected with the line was found in a satisfactory manner. The street works from Spellow-lane to Preston-road have been completed ready for the overhead equipment, and the laying of the lines from that point to Aintree is well advanced.

The new schools, Deskford, N.B., are being warmed and ventilated by means of Shorland's patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The erection of the new reading-room has been commenced at Bridgend, near Lostwithiel. The contract for the work has been let to Messrs. Mark Bennett and Henry Brown, of Lostwithiel, and the building will be erected in accordance with the plans, &c., prepared by Mr. A. E. Skentelbery, architect, Lostwithiel, and as approved by the Bodmin Rural District Council.

Our Office Table.

The discussion by the Discussion Section of the Architectural Association last Friday of registration for architects was a distinctly useful one. As usual, gentlemen who have got into the Institute without examination, and gentlemen who are so artistic that for their lives they could not pass an examination in the "professional" essentials of their craft, trotted out the old ghosts of arguments against registration, but mostly, we fancy, with their tongues in their cheeks. The fact is that those who oppose registration to-day are generally of the opinion of the gentleman of the name of Jemmett, who thinks that the standard of excellence fixed even to-day by the professional societies is too high, and that the R.I.B.A. itself is "altogether too professional." Jemmett and Co. may console themselves! Anybody that likes to employ architects to *dream* buildings for them will not be hindered by registration!

The new session of the Royal Institute of British Architects will be inaugurated on Monday evening, November 6th, when Mr. William Emerson, the President, will deliver his opening address. The programme for the subsequent meetings is as follows:—Nov. 20, "The Buildings of the French Exhibition of 1900," by M. Charles Lucas; Dec. 4, business meeting; Dec. 18, "Decorative Patterns from Excavations in Cyprus in 1896," by Dr. A. S. Murray, F.S.A., Keeper of Greek and Roman Antiquities at the British Museum; Jan. 8, 1900, business meeting; Jan. 16-27, annual exhibition of drawings submitted for the Institute prizes and studentships, to be held at the Alpine Club, Savile-row; Jan. 22, award of prizes and studentships; Feb. 5, President's address to students, and presentation of prizes; Feb. 19, "Lunatic Asylums at Home and Abroad," by G. T. Hine; March 5, business meeting, and election of Royal Gold Medallist; March 19, "Ancient Lights," by J. Fletcher Moulton, Q.C., M.P., F.R.S., J. Douglass Mathews, and Beresford Pite; April 2, "Artisans' Dwellings," by John Honeyman, R.S.A., Henry Spalding, W. E. Wallis, and Owen Fleming; April 23, paper (subject to be announced later); May 7, annual general meeting; May 21, "The Art of the late Professor Cockerell," by J. M. Brydon, Vice-President; June 11, business meeting: annual elections; and June 25, presentation of the Royal Gold Medal.

The chimney-pot hat is evidently a much more time-honoured institution than one had supposed, for in the picture by Jan Van Eyck, who died in 1440, selected by Sir Edward Poynter as the chief specimen for his book on the National Gallery, a certain Jean Arnolfini is wearing a beaver worthy of the old Hambledon Club. Sir Edward pronounces this picture, which contains portraits of Arnolfini and his wife, Jeanne de Chenany, in a bedroom, and is signed and dated 1434, one of the most precious possessions of the National Gallery. The painting, purchased from Major-General Hay in 1842, was illustrated as No XXXI. of our series of "Old Masters from the National Gallery," in our issue of Oct. 20, 1893.

Several of the riparian authorities have, during the past week, considered the question of conditionally promising the apportionments which would be due from them under the scheme for the construction of a new lock at Battersea. Of the five that are situated highest up the river in the area affected, only one—Heston-Isleworth, whose apportionment is £3,835—has followed the lead set by the Hammersmith Vestry, and assented. The Brentford District Council—£3,639—being doubtful about the advantage of the scheme to the barge and dock traffic of its district, declined. The Chiswick District Council—£7,818—expressed itself favourably, but has decided nothing. The Barnes and Mortlake District Council—£5,458—feared that the surface drainage of the district might be prejudicially affected, and proposes to take further advice on the point. The Richmond Town Council, on behalf of Kew—£1,081—referred the matter to a committee without comment. But the Thames Conservancy Board, whose expected assistance was one of the chief factors in the scheme, has decided that it cannot contribute anything.

The Health Committee of the Liverpool Corporation have recommended to the city council that there should be included in the next application to Parliament powers to enable the widening of the following important thoroughfares to be carried out:—Smithdown-road, from 35ft. to 60ft., on the north side between Greenbank-road and Garmoyle-road; Rice-lane, from 42ft. to 50ft., between the entrances to Walton Park on the west side; West Derby-road, from 35ft. to 60ft., and a portion to 66ft., on the south side and in an easterly direction from Green-lane; Oakfield-road, from 34ft. to 50ft., on the south side, westerly from Breck-road; Everton Valley, from 35ft. to 43ft. 6in., on the south side, between St. Domingo-road and Royal-street; and Islington, from 45ft. to 60ft., on the north side between St. Anne-street and Clare-street. The committee also recommended the city council to make an application for an extension of the time limit for carrying out the improvement at the corner of Lodge-lane and Smithdown-road—viz., widening that portion of Lodge-lane from 42ft. to 50ft. for a length of about 25 yards on the east side, Parliamentary powers for which were obtained in 1897.

The Corporation of Glasgow held a third special meeting on Friday to consider the building regulations which it is proposed to bring before Parliament in the form of a Bill. The clauses considered included those dealing with the height of buildings and the width of streets. Considerable discussion took place regarding the proposal to restrict the height of business premises to one-fifth more than the width of the street. In Miller-street this would mean that buildings could not be more than 48ft. Mr. Dickson held that such a limitation would be an unfair obstruction to business and the proper use of valuable sites in the centre of the city. He held that work could be carried on under healthier conditions in high buildings. Mr. Walter Paton said the effect of restricting buildings to 48ft. in narrow streets would be that owners would make four low stories, whereas if 60ft. were allowed the present tendency to make roofs higher and rooms consequently airier, would be continued. Mr. Calderwood, as a practical builder, supported the clause, and declared that, while some hardship might be entailed, the few must suffer for the good of the community. On a division, the clause was carried by 20 votes to 14. It was agreed, without discussion, that dwelling-houses should not be higher than the width of the street. The corporation again adjourned.

The British Fire Prevention Committee started its winter session on Wednesday by arranging a private view of its testing station at Regent's Park, and showing a series of experimental tests with a concrete floor, with an iron safe, and with some wooden doors. The committee have furnished the following account of the tests: "As regards the floor, it was of steel girders, with a concrete filling prepared on the lines recently required by the London County Council. The fire was intended to be of two and a half hours' duration at a temperature of 2,000° Fahr., but the floor collapsed in approximately an hour and a half before that temperature had been quite reached. The safe was tested under similar conditions; it bulged badly, and could not be opened at the close of the test to see the effect on the contents. Regarding the doors, they were of solid 2in. deal and 2in. pitch-pine, and the duration of the test was one hour at a temperature reaching approximately 1,500° Fahr. The fire began to break through after about a quarter of an hour, but the doors did not collapse until quite fifty minutes after the commencement of test." The testing operations were conducted by a subcommittee of the executive, comprising several district surveyors (Messrs. H. H. Collins, E. Marsland, and F. Hammond), with Mr. Frederick Farrow, F.R.I.B.A., Mr. Max Clarke, A.R.I.B.A., and Mr. Charles Goad, C.E.

At a Local Government Board inquiry held at Nelson on Friday, the interesting point of the right of one local authority to enter the district of a neighbouring authority and establish an infectious disease hospital there was submitted for the decision of the Local Government Board. The Nelson Corporation asked for sanction to borrow £2,000 for the purchase of ten acres of land, for the site of an infectious diseases hospital, on the borders of the borough, but in the district of the Brierfield District Council. The cost of the proposed hospital is estimated at £10,000. It appeared that so long ago as in 1886 a joint hospital board was formed for several districts, including Nelson, in North-east Lancashire, but for several years nothing was done in the scheme, and in 1894 an order was obtained excluding Nelson from the joint authority and including the Borough of Burnley. The rapid growth of Nelson, the population of which had increased from 15,000 in 1886 to 35,000 at the present time, was assigned as the reason why the borough should be allowed to provide its own hospital accommodation. The Nelson Corporation contended that it had the right to enter the neighbouring authority's district and erect a hospital there without the consent of the Brierfield Council, provided that the building plans conformed with the Brierfield by-laws. Brierfield opposed the application, contending that Nelson should be required to drain the hospital into its own sewer, and treat the sewage at its own outfall works, and not put Brierfield to the expense of about £1,300 to provide for the hospital sewerage. To meet this objection Nelson offered to include the site of the proposed hospital in the borough area. During the inquiry the inspector stated that the Local Government Board would require that the sewerage arrangements of the proposed hospital should be clearly shown, but the liability for the sewerage was a legal question, which he did not think came under the jurisdiction of the Board.

Those who have to build scaffoldings to protect the public during building operations should see that they are strong enough to carry any proper load, and foremen should watch that their labourers do not pile up unreasonable weights of brick and stone on stagings. On the evening of the Dewey parade in New York, a shed built over a sidewalk in Fourteenth-street, intended to protect passers-by from falling objects, gave way under the weight of several tons of bricks, which had been gradually accumulating on it. Four persons were under the shed at the time. Three of them, alarmed by the sound of the cracking of the timbers, succeeded in making their escape; but the fourth, a young Bohemian woman, was caught by a mass of falling material, and instantly killed.

It appears that certain decorations in the Capitol at Washington have been treated in a manner which has excited the indignation of the Government officials, who will endeavour, at the next session of Congress, to secure the passage of a law to prevent such misdemeanours. Many of the smaller rooms in the Capitol are, says the *Scientific American*, elaborately frescoed, in the style of fifty years ago, with the arms of the States, or other decorations, sometimes of an interesting character. Where these decorations have grown shabby with age, it seems that it has been the practice, instead of cleaning or retouching them, to scrape them off, and paint the wall in plain colour. Congress will, doubtless, put an effective stop to such a glaring abuse of public property.

MEETINGS FOR THE ENSUING WEEK.

Thursday.—Society of Architects. Annual Meeting, St. James's Hall, Piccadilly. 8 p.m.

Friday.—Architectural Association. "Construction of Circular Stairs and Vaults," by Lawrence Harvey. 7.30 p.m.

Glasgow Architectural Craftsmen's Society. "My Impressions of Glasgow Cathedral," by Alexander Wagstaff. 8 p.m.

Auctioneers' Institute. Presidential Address, by W. Roland Peck, 57, Chancery-lane, W.C. 8 p.m.

THE ARCHITECTURAL ASSOCIATION.

OCTOBER 27th, ORDINARY GENERAL MEETING, 9, Conduit-street, W., 7.30 p.m. Paper by Mr. LAWRENCE HARVEY on "The Construction of Circular Stairs and Spiral Vaults." Mr. R. H. HOOK will demonstrate the properties of varieties of stone with specimens.

G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

Mr. W. Roland Peck, the President of the Auctioneers' Institute of the United Kingdom, will hold an "at home" at the Royal Institute of Painters in Water-colours, Piccadilly, on Thursday, October 26; and will, on the following evening, deliver his inaugural address to the members, at the Institute, 57 and 58, Chancery-lane.

The new Central Technical Schools for Cornwall, at Truro, are to be opened by the Lord-Lieutenant of the county next week as a memorial to the late Sir Charles Lemon, Bart. The buildings have been erected from plans by Mr. Silvanus Trevail, V.P.S.A., of Truro, at the sole cost of Mr. J. Passmore Edwards, and on a site given by the city council. They were illustrated and described in detail in our issue of May 28, 1897.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	,,	9 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£8 15 0	to	£9 15 0
Cast-Iron Stanchions	8 15 0	,,	9 15 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised.	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 15 0	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18 3	per cwt.

Cast-Iron Socket Pipes—			
3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	57½ p.c.
Water-Tubes	52½
Steam-Tubes	47½
Galvanised Gas-Tubes	42½
Galvanised Water-Tubes	37½
Galvanised Steam-Tubes	32½

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	18 0 0	,,	19 0 0
Pig Lead, in 1cwt. pigs	17 0 0	,,	18 0 0
Lead Shot, in 28lb. bags	20 0 0	,,	21 0 0
Copper Sheets, sheathing and rods	93 10 0	,,	94 0 0
Copper, British Cake and Ingot	79 10 0	,,	80 0 0
Tin, Straits	146 0 0	,,	147 0 0
Do., English Ingots	150 0 0	,,	151 0 0
Spelter, Silesian	22 7 6	,,	22 12 6

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	5 5 0	,,	7 0 0
,, Oak	,, ...	4 7 6	,,	6 5 0
,, Birch	,, ...	2 15 0	,,	4 12 6
,, Elm	,, ...	4 17 6	,,	5 10 0
,, Ash	,, ...	4 0 0	,,	5 0 0
Dantsic and Memel Oak	,, ...	3 0 0	,,	4 0 0
Fir	,, ...	2 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	4 2 6	,,	5 15 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 5 0	to	£26 15 0
,, 2nd	15 5 0	,,	18 10 0
,, 3rd	9 5 0	,,	10 15 0
Canada Spruce, 1st	9 5 0	,,	11 5 0
,, 2nd and 3rd	7 15 0	,,	9 0 0
New Brunswick	7 0 0	,,	8 10 0
Riga	8 5 0	,,	10 0 0
St. Petersburg	10 10 0	,,	17 0 0
Swedish	10 10 0	,,	17 10 0
Finland	9 10 0	,,	11 0 0
White Sea	12 5 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 10 6	,,	£0 15 0
2nd ditto	0 9 6	,,	0 10 9
Other qualities	0 4 6	,,	0 9 9
Staves, per standard M:—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£22 10 0	to	£22 15 0
Rapeseed, English pale	,, ...	24 15 0	,,	25 15 0
Do., brown	,, ...	24 5 0	,,	24 10 0
Cottonseed, refined	,, ...	19 10 0	,,	20 10 0
Olive, Spanish	,, ...	33 0 0	,,	33 10 0
Seal, pale	,, ...	18 10 0	,,	19 0 0
Cocoanut, Cochin	,, ...	29 5 0	,,	29 10 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	23 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 ½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

LIST OF COMPETITIONS OPEN.

Elland—Baths on South House Estate	No first; £20, £10	The Clerk, U.D. Council Offices, Elland	Oct. 28
Horley—Fire-Engine Station	£10	Robert L. Love, Solicitor, Clerk to Parish Council, Horley, Surrey..	Nov. 1
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	,, 30
Bury, Lancs—Infectious Diseases Hospital, Bolton-road (limit £12,500; Assessor)	£100, £50, £25	The Borough Engineer, Corporation Offices, Bank-street, Bury	Dec. 1
Leicester—Workhouse Infirmary (360 patients) and Imbeciles' Home (150 patients)	£100, £50, £25	The Clerk to Board of Guardians, Leicester	—

LIST OF TENDERS OPEN.

BUILDINGS.

Plymouth—Superstructure of New Offices	Prudential Assurance Company	Waterhouse and Son, Architects, 20, New Cavendish-street, W.	Oct. 21
Farnborough—Police Cottages		W. J. Taylor, County Surveyor, The Castle, Winchester	,, 21
Rainham—Bible Christian Chapel and Schoolroom	Trustees	The Rev. F. Sparrow, Fern Cottage, Wakeley-road, Rainham, Kent	,, 21
Holbeck—Twenty-Six Houses, Westbourne-place and Avenue..		C. Fredk. Wilkinson, Architect, 35, Park-square, Leeds	,, 21
Kensal Rise—Public Reading-Room in Bathurst-road	Willesden District Council	Messrs. Done, Hunter, and Co., Architects, Cricklewood, N.W.	,, 21
Armagh—Post-Office		The Office of Public Works, Dublin	,, 21
Wigan—Excavating and Hoarding-in Technical College Site		Briggs and Wolstenholme, Architects, Richmond-terrace, Blackburn	,, 21
Aviemore—Block of Eight Workmen's Houses	Highland Railway Co.	W. Roberts, Engineer-in-Chief, Inverness	,, 21
Wheatley—Extensions to Board Schools		Athron and Beck, Architects, Dolphin Chambers, Doncaster	,, 21
Keighley—Rebuilding Albert Hotel		John Haggas, Architect, North-street, Keighley	,, 21
Batley—Bakery, &c., Clerk Green-street	Co-operative Society	H. B. Buckley, Architect, 8, East Parade, Leeds	,, 21
Wylam-on-Tyne—Stable Buildings, &c.		Arthur Stockwell, Architect, 11, Pilgrim-street, Newcastle	,, 23
Leamington—Free Library, School of Art, &c.	Corporation	J. Mitchell Bottomley, Architect, 13, Bond-street, Leeds	,, 23
Nottingham—Eighty-Six Cottages	Estates Committee	Arthur Brown, M.I.C.E., City Engineer, Guildhall, Nottingham	,, 23
Belfast—Warehouse, Brunswick-street		J. J. Phillips and Son, Architects, 61, Royal-avenue, Belfast	,, 23
Leeds—Clothing Factory, Wellington-street	R. B. Brown and Sons	Chorley, Connon, and Chorley, Architects, 15, Park-row, Leeds	,, 23
Bradford—Warehouse Foundations, Peckover-street		Milnes and France, Architects, 99, Swan-arcade, Bradford	,, 23
Bingley—Infants' School in Belgrave-road	School Board	Wm. Rhodes Nunns, Architect, Market-street, Bingley	,, 23
Leeds—Accumulator-House at Tramway Depot, Kirkstall-road	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	,, 23
Middleton-in-Teesdale—Repewing Wesleyan Chapel		Wm. James, Hill-terrace, Middleton-in-Teesdale	,, 24
Colwyn Bay—Electric Lighting Station	Urban District Council	Wm. Jones, A.M.I.C.E., Engineer, Council Offices, Colwyn Bay	,, 24
Hubbert's Bridge—Farm Premises	W. Ward	R. H. Holmes Hand, Architect, Double-street, Spalding	,, 24
Walthamstow—Additions Gamuel-rd. and Higham Hill Schools	School Board	W. A. Longmore, F.R.I.B.A., Bridge Chbs., Hoe-st., Walthamstow	,, 24
Bradford—Foundry and Machine Shop, Dudley Hill		Samuel Jackson and Son, Architects, Bradford	,, 24
Manchester—Workshop and Offices, Ardwick	Electricity Committee	F. E. Hughes, Secretary, Electricity Dept., Town Hall, Manchester	,, 24
Romford—Isolation Wards, Administrative Block, &c.	Joint Hospital Board	W. Whitmore, Architect, 17, Duke-street, Chelmsford	,, 24
Manchester—Warehouses, &c., Rose-grove	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	,, 24
Leeds—Four Houses and Shops at Roundhay		Charles Fowler, Architect, 24, Basinghall-street, Leeds	,, 25
Dovercourt—Additions to Central Board Schools	Harwich School Board	Chas. E. Butcher, Architect, 3, Queen-street, Colchester	,, 25
Stoke-upon-Trent—Cottage Homes, &c.	Guardians	C. Lynam, Architect, Stoke-upon-Trent	,, 25
Lossiemouth—Villa in Dunbar-street		A. and W. Reid and Wittet, Architects, Elgin	,, 25
Aston Manor—Twelve Cottages and House, Chester-street	Urban District Council	H. Richardson, A.M.I.C.E., Engineer, Council House, Aston Manor	,, 25
Oldham—Public Baths	Corporation	S. A. Pickering, A.M.I.C.E., Boro' Surveyor, Town Hall, Oldham	,, 25
Ruabon—Alterations at Ponkey Board Schools	School Board	J. Morison and Son, Architects, King-street, Wrexham	,, 25
Elgin—House, Richmond-place		A. and W. Reid and Wittet, Architects, Elgin	,, 26
Birmingham—Office at Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 26
Halifax—Additions to Branch Stores in Queen's-road	Industrial Society	Medley Hall, Architect, 29, Northgate, Halifax	,, 26
Bradford—House, Bolton-road		J. Cowgill, Architect, Market-street, Bradford	,, 26
Knottingley—Additions to Anvil Inn	Carter's Brewery Co., Ltd.	Tennant and Bagley, Architects, Pontefract	,, 26
Canterbury—Asylum Buildings	Town Council	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	,, 26
Halifax—Warehouse at Cross Hills		Joseph F. Walsh, Architect, Bank Chambers, Halifax	,, 26
Ripponden—Slaughterhouses	Co-operative Society	Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	,, 27
Whitehall, S.W.—Foundations, &c., for New War Office	H.M. Commissioners of Works	Sir John Taylor, H.M. Office of Works, Storey's Gate, S.W.	,, 27
Alnmouth—Marine Residence and Stabling		M. Temple Wilson, A.S.I., Architect, Alnwick	,, 27
Keith—Addition to House at Rosehall	William Gordon	F. D. Robertson, Architect, 92, Mid-street, Keith	,, 27
Kentish Town, N.W.—Excavations, &c., for Public Baths	St. Pancras Vestry	T. W. Aldwinckle, A.R.I.B.A., Architect, 1, Victoria-street, S.W.	,, 27
Weston-super-Mare—Photographic Studio, Railway Parade		Hans F. Price, Architect, Weston-super-Mare	,, 27
Penygroes—Alterations to Chapel, and New Schoolroom	Committee of Bethel C.M. Chapel	The Rev. W. E. Williams, Bryn Myfyr, Penygroes, R.S.O.	,, 27
Letterkenny—Additions to Creeve House	David Leitch	John M'Intyre, Architect, Letterkenny	,, 27
Kennethmont—Workmen's Houses, Ardmore Distillery		Charles C. Doig, Architect, Elgin	,, 28
Canterbury—Six Cottages, Sturry-road	Town Council	The City Surveyor, Tudor Chambers, Canterbury	,, 28
Halifax—Foundries, &c.		Jackson and Fox, Architects, Rawson-street, Halifax	,, 30
Sandown—Higher Grade Board School	Brading School Board	James Newman, Architect, Thornton, Sandown	,, 31
Barry—Additions to Intermediate School	Glamorgan County Council	T. Mansel Franklen, Clerk, Westgate-street, Cardiff	,, 31
Fletton Rural—Schools (600)	School Board	Wm. Boyer, Architect, 10A, Cowgate, Peterborough	,, 31
Myton-on-Swale—School		W. Ward, Myton Hall, Helperby	Nov. 1
Gayton—Alterations to Workhouse	Guardians	Herbert T. Tilson, Architect, Railway-road, King's Lynn	,, 1
Mallow—Repairs to Cottages, Sinking Wells, &c.	Rural District Council	M. Regan, Clerk, Mallow	,, 1
Halifax—Primitive Methodist Chapel, St. Thomas-street		Medley Hall, Architect and Surveyor, 29, Northgate, Halifax	,, 2
Alresford—Additions to Workhouse	Guardians	W. H. Hunt, Architect, Alresford, Hants	,, 2
Upper Holloway, N.—Chimney Shaft (160ft.) at Workhouse	St. Mary, Islington, Guardians	Wm. Smith, Architect, 65, Chancery-lane, W.C.	,, 2
Brecon—Intermediate Schools		J. H. Phillips, Cardiff, and F. Baldwin, Brecon, Joint Architects	,, 2
Banff, N.B.—Coastguard Buildings	Admiralty	The Coastguard Station, Banff, N.B.	,, 3
Padstow—Coastguard Buildings	Admiralty	The Coastguard Station, Padstow	,, 3
Rushall—Additions to Boys' School	School Board	Hickton and Farmer, Architects, Bridge-street, Walsall	,, 4
Douglas, I.M.—Completion of Enlargement of Head Post Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	,, 7
Walthamstow—Blackhorse-road School (1,500)	School Board	W. Longmore, F.R.I.B.A., Bridge Chmbs., Hoe-st., Walthamstow	,, 7
Enfield—Alterations and Additions to Alma-road School	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	,, 7
West Brompton—Additions to Infirmary, Fulham-road	St. George's Union Guardians	E. T. Hall, F.R.I.B.A., Architect, 57, Moorgate-street, E.C.	,, 7
Victoria, Mon—Forty Houses		Swalwell and Creighton, A.R.I.B.A., Dock-street, Newport, Mon.	,, 8
Leicester—Wholesale Market in Halford-street	Corporation	Walter Brand, A.R.I.B.A., 16, Bishop-street, Leicester	,, 13
Woolwich—Public Library, William-street	Board of Health	Church, Quick, and Whincop, Architects, William-st., Woolwich	,, 14
Rhyl—School Buildings	Governors of County Schools	Frank H. Shaylor, Architect, Belvoir House, Shrewsbury	,, 15
Southampton—Workhouse Infirmary, Shirley Warren	Guardians	W. H. Mitchell, Son, and Guttridge, Architects, Southampton	,, 20
Cricklade—County Police-Station	Wilts Standing Joint Committee	Charles S. Adye, County Surveyor, County Offices, Trowbridge	,, 22
Brighouse—Rebuilding the Grove Inn, Elland-road		J. Lane Fox, Bond-street, Dewsbury	—
Stone—One Hundred Cottages	Co-operative Land Society, Ltd.	The Society's Offices, 14 and 15, Coleman-street, E.C.	—
Wyke—Stabling for the Red Lion Inn		J. Lane Fox, Architect, Bond-street, Dewsbury	—
North Shields—Rising Sun Inn	Tyne Improvement Commission	W. H. Knowles, F.S.A., 37, Grainger-street, Newcastle	—
Loughborough—Converting Dormitory into Ward		W. T. Hampton, F.S.I., Architect, Swan-street, Loughborough	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Isle of Walney—Two Hundred Workmen's Dwellings	Vicars, Sons, and Martin	The Isle of Walney Estates Co., Ltd., Walney	—
Poole—Two Cottages, Stable, Coach-House, &c.		F. Butler, Carriage Works, Poole	—
Northbourne—Repairs to Church		The Rector or Churchwardens, Northbourne, Deal	—
Stockton—Rebuilding 71, High-street	S. S. Eades	T. W. T. Richardson, Architect, 57, High-street, Stockton	—
Ashton-under-Lyne—Houses (17 to 40)		Samuel Lomas, 5, Stockport-road, Ashton-under-Lyne	—
Prestatyn—Villa		Burton & Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Barry—New Buildings off Park-crescent	W. J. Rogers, Ltd.	J. P. Jones, Richards, and Budgen, Archts, 18, St. Mary-st., Cardiff	—
Rawtenstall—House, Warehouse, and Stable at Holme Bank		John Taylor, 6, Ormerod-street, Rawtenstall, Lancs	—
Bexley Heath—Six Tenement Houses		Hawkins & Edgecombe, Architects, 22, Henrietta-st., Covent Garden	—
Lochmaddy—School and Teachers' House at Kylis Flodda	South Uist School Board	A. MacElfrish, Clerk, Lochmaddy	—
East Ham—Congregational Church		J. D. and S. J. Mould, Architects, 53, Queen Victoria-street, E.C.	—
Utley—Additions to the Roebuck Inn		John Judson and Moore, Architects, York Chambers, Keighley	—
Consett—Two Engine Houses	Iron Co., Ltd.	The Engineer's Office, Consett, Durham	—
Lulworth—Restoring Buttresses of East Lulworth Tower		The Rev. R. Usher, East Lulworth Vicarage, Wareham	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Leigh—Warehouse at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Wombwell—Chimney (40 yards) at Main Colliery		The Colliery Offices, Wombwell, Yorks	—
Leeds—Warehouse		W. Rusby, 25-27, Meadow-lane, Leeds	—
Buxton—Two Detached Villas	B. Wardle	Garlick and Flint, Architects, Terrace-road, Buxton	—
Ulverston—Bank, County-square		Settle and Farmer, Architects, Ulverston	—
Castleford—Six Houses, Ambler-street		Garside and Pennington, Architects, Central Chambers, Castleford	—
Warsaw—Freezing-Chambers, &c., in Market Halls	Municipality	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	—
Great Yarmouth—Engineer's Shops, Foundry, and Stores		Crabtree and Co., Engineers, Great Yarmouth	—

BUILDINGS—*continued.*

Preesall—House		John Lawrenson, 41, London-street, Fleetwood	—
Leeds—Frame Schoolhouse, Cardigan-road	St. Margaret's Church Trustees	Corson and Jones, Architects, 25, Cook-street, Leeds	—
Shipley—Club Premises		John Jackson, M.S.A., Architect, Barry-street, Bradford	—
Rothbury—Houses		Thomas Muckle, Rothbury	—
Carlisle—Converting 30, Lowther-street, into Business Premises	Clark Bros. and Co.	T. Taylor Scott, F.R.I.B.A., 43, Lowther-street, Carlisle	—
Ilford—Congregational Church		J. D. and S. J. Mould, Architects, 52, Queen Victoria-street, E.C.	—
Broughton-in-Furness—Washhouses and W.C.'s at Cinder Hill		John Clark, Solicitor, Broughton	—
Leeds—Business Premises and Manager's House, Claypit-lane	Henry Clarkson	Butler, Wilson, and Oglesby, Architects, 12, East Parade, Leeds	—
Richmond—Fifty Houses		J. Pennington, F.A.I., Surveyor, Richmond	—
Abergavenny—Additions to National Schools, Hereford-road		E. A. Johnson, F.R.I.B.A., Abergavenny	—
Gorton—Extensions to Stables	Urban District Council	The Council Office, Hyde-road, Gorton	—
Tottenham—Six-Roomed Houses in Bruce-grove		S. Ford, A.R.I.B.A., F.S.I., Archt., 3, South-sq., Gray's Inn, W.C.	—
Ballyclare—Rebuilding Dye-House, &c.		The Whitepark Finishing Company, Ballyclare	—
Radyr—Wesleyan Chapel	Chapel Trustees	J. P. Jones, Richards, and Budgen, Archts., St. Mary-street, Cardiff	—
Easington—Cottages		The Easington Coal Company, Limited, Sunderland	—
Clowne—Sixty Houses		Frank Cook, Architect, 22, Leeming-street, Mansfield	—
Stafford—Alteration to Premises in Lichfield-road	Laundry Co.	J. Goodchild, Hazeldene, Stafford	—
Bradford—Alteration to Premises, All Saints'-road		G. C. Ross, Architect, Morley-street, Bradford	—
Morecambe—Concert Hall, West End Market		H. Howarth, Architect, 7, Regent-road, Morecambe, W.	—
Barrow—Alterations to Albion Hotel	Henry Spencer and Co.	E. M. Young, Architect, 90, Duke-street, Barrow	—
Earl's Barton—Games Rooms, &c., at Institute		Mosley & Anderson, Architects, Fish-st., Northampton	—
Tottenham—Work in Woodlands Park and Alexandra Schools	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	—
Ilkley—Additions to Property in The Grove		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—
Burnley—Brick Warehouse, Park Horse-yard	Misses Harker	G. B. Rawcliffe, Architect, 5, Nicholas-street, Burnley	—
Shirebrook—Nave and Aisle to Holy Trinity Church		Hedley J. Price, A.R.I.B.A., 24, Low-pavement, Nottingham	—
Castleton—New Works	David Bridge and Co.	T. Townsend, jun., Architect, District Bank Chambers, Rochdale	—
Hamilton—District Offices		Alexander Cullen, F.R.I.B.A., Brandon Chambers, Hamilton	—
Dundrum—Business Premises	J. M'Clafferty	J. J. M'Donnell, M.R.I.A.I., 27, Chichester-street, Belfast	—
Shipley—Club Premises		J. Jackson, M.S.A., Architect, Barry-street, Bradford	—

ENGINEERING.

Luton—Electric Lighting Plant	Town Council	Albion T. Snell, Engineer, Suffolk House, Cannon-street, E.C.	Oct. 21
Oxton, Earlston—Water Supply Works (two miles of 3in. pipes)		R. Paterson, C.E., 3, William Bank, Earlston	" 21
Swinton—Sinking Well	Urban District Council	R. Fowler, C.E., Engineer, Swinton, near Rotherham	" 24
Hastings—Service Reservoir and Filter-House, West Hill	Corporation	P. H. Palmer, M.I.C.E., Town Hall, Hastings	" 24
Glemsford—Experimental Boring	Urban District Council	T. W. A. Hayward, C.E., Melford-road, Sudbury, Suffolk	" 24
Ardee, Ireland—Pumps at Church Hill and Coneyburrow	Rural District Council	Nicholas Matthew, Rural District Councillor, Cappoge	" 24
Gloucester—Refuse Destructor, &c.	Electricity Supply Committee	Richard Read, A.M.I.C.E., City Surveyor, Gloucester	" 24
Barking—Light Railway Plant	Urban District Council	W. C. C. Hawtayne, Engineer, 9, Queen-street-place, London, E.C.	" 24
Llanelly—Locomotives, Weighbridges, and Turntables	Navigation Commissioners	Colin P. Fowler, A.M.I.C.E., Harbour Office, Llanelly	" 25
Knottingley—Machinery for Purification Works	Urban District Council	John Richardson, M.I.C.E., of 5, Central Bank Chambers, Leeds	" 25
Wigan—Electric-Lighting Plant	Corporation	H. Collings Bishop, Borough Electrical Engineer, Wigan	" 25
Islington, N.—Secondary Battery	Vestry of St. Mary	The Electrical Engineer, 50, Eden-grove, Holloway, London, N.	" 25
Burton-upon-Trent—Concrete Tank and Shallow Well	Corporation	George T. Lynham, Borough Engineer, Town Hall, Burton	" 26
Cwm Brombil—Cast-Iron Main (4in.)		J. Taylor, Sons, & Santo Crimp, C.E., Gt. George-st., Westminster	" 27
Wivenhoe—Sinking Borehole	Urban District Council	Sands and Walker, Engineers, Angel-row, Nottingham	" 27
Stonehaven—Harbour Extension	Harbour Trustees	Jas. Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen	" 30
Port Elizabeth to Humansdorp, Capetown—Railway (70 miles)		The General Manager of Railways, Capetown	" 30
Birkenhead—Cooking Apparatus at Workhouse at Tranmere	Guardians	E. Kirby, Architect, 5, Cook-street, Liverpool	" 30
Aylesbury—Machinery at Sewage Disposal Works	Urban District Council	J. H. Bradford, Surveyor, 2, Rickford's Hill, Aylesbury	" 31
Chipping Campden—Waterworks	Rural District Council	Nicholson Lailey, A.M.I.C.E., 16, George-street, Westminster	" 31
Upper Holloway, N.—Boiler and Flues, &c., at St. John's-road Workhouse	St. Mary, Islington, Guardians	Wm. Smith, Architect, 65, Chancery-lane, W.C.	Nov. 2
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	" 3
Faversham—Sinking Well	Water Co.	Baldwin Latham, M.I.C.E., 13, Victoria-street, Westminster	" 4
Wrexham—Boiler and Engine House Plant	Town Council	W. H. Trentham, 39, Victoria-street, Westminster, S.W.	" 8
Warrington—Covered Concrete Service Reservoir (4,000,000gal.)	Corporation	James Deas, C.E., M.I.M.E., Bank House, Warrington	" 11
Latheronwheel—Concrete Breakwater	Caithness County Council	James Fraser, Civil Engineer, Inverness	" 11
Birkenhead—Electric Motor-Cars	Corporation	C. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	" 14
Port Dundas—Two 800H.P. Auxiliary Engines	Glasgow Corporation	John Young, General Manager, 88, Renfield-street, Glasgow	" 14
Blackburn—Six-Cell Destructor, Daisyfield		William Stubbs, Borough Engineer, Blackburn	" 15
Hoylake—Electric Lighting Plant	Urban District Council	T. L. Miller, M.I.E.E., 7, Tower Buildings N., Water-st., Liverpool	" 15
Panama—Aqueduct		Her Majesty's Consul at Panama	Dec. 30
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Colonial Secretary, Colombo	Jan. 4
Ilford—Portable Steel Crane (3-ton)	Gas Co.	The Engineer's Office, Gasworks, Ilford	—
Uddington—Electric Lighting Plant		J. Watson, Builder, Uddinston, Scotland	—
Stepney—Cooking and Heating Apparatus, Ratcliffe Workhouse	Guardians	R. Banks Martin, Architect, 103, Plashet-grove, East Ham	—
Chetwynd Aston—Waterworks	Newport Rural District Council	W. Wyatt, Engineer, Bryndwr, All Saints, Shrewsbury	—
Morecambe—Electric Lighting Extensions	Urban District Council	C. F. Parkinson, M.I.E.E., Wood Hill-lane, Morecambe	—
Warrington—Air Compressors	Sanitary Works Committee	The Sanitary Engineer's Office, Bank House, Warrington	—

FENCING AND WALLS.

Bridlington—Fence Wall, Medway Green	Urban District Council	C. Gray, Clerk, Bridlington	Oct. 23
London, W.—Fencing Materials	Great Western Railway Co.	The Stores Superintendent's Office, Swindon	" 23
Swinton—Boundary Brick Wall, Victoria Park	Urban District Council	H. Entwistle, Surveyor, Council Offices, Swindon	" 23
Basford—Fencing (720 yards)	Guardians	C. J. Spencer, Public Offices, Basford	" 23
Ilford—Iron Fencing, Green-lane Recreation Ground	Urban District Council	John W. Benton, Clerk, Council's Offices, Ilford	" 24
Barnstaple—Iron Fencing (138 yards)	Rural District Council	James Richards, Surveyor, Kentisbury	" 26
Catcliffe—Wrought-Iron Palisadings at New Schools	School Board	John J. Robinson, Catcliffe, near Rotherham	" 26
Bargoed, Wales—Basement, Retaining Walls, and Drainage	Hanbury Arms Hotel	D. J. Lougher, Architect, Bank Chambers, Pontypool	Nov. 1
Blaydon-on-Tyne—Creosoted Military Fencing (900 lineal yards)	Urban District Council	G. Symon, Council Offices, Blaydon	" 2
Great Berkhampstead—Boundary Wall, Lower King's-road	Urban District Council	Edward H. Adey, Surveyor, Shrublands-terrace, Berkhampstead	—

PAINTING.

Leeds—Exterior of Union-street Baths	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	Oct. 23
Pickering—Wesleyan Church and Schoolroom		J. Richman, Secretary to Trustees, Pickering	" 23
Leeds—Interior of Kirkstall-road Baths	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	" 23
Greenhithe—Seven Shops		G. W. Cobham, Surveyor, 1, Edwin-street, Gravesend	—

ROADS AND STREETS.

Grimsby—Road Formation and Drainage Works	G. S. Stephenson	William Waller, 243, Freeman-street, Grimsby	Oct. 21
St. Albans—Road Works, Spencer Park Estate		Gibson and Co., St. Albans	" 21
South Shields—Kerbing and Drainage Works, St. Bede Building Estate, near Tyne Dock		J. Walter Hanson, Archt. and Surv., 7-9, King-street, South Shields	" 23
Derby—Street Works	Corporation	John Ward, Borough Surveyor, Babbington-lane, Derby	" 23
Streatham Castle—Road Works, &c.		Robert Robinson, C.E., 6, Dixon-terrace, Darlington	" 23
Finchley, N.—Repairs to Roads at St. Pancras Cemetery	St. Pancras Vestry	C. H. F. Barrett, Vestry Clerk, Vestry Hall, Pancras-road, N.W.	" 23
Plymouth—Making-up, &c., Streets and Lanes		James Paton, Borough Engineer, Plymouth	" 23
Brockley, S.E.—Kerbing, &c., Hazeldon-road	Lewisham Board of Works	The Surveyor's Department, Lewisham Town Hall, Catford, S.E.	" 24
Stanley—Forming Cemetery-road	Urban District Council	Joseph Routledge, Surveyor, Council Offices, Stanley	" 24
Bromley—Making-up Cooper's Yard	Urban District Council	Fred. H. Norman, Clerk, Bromley	" 24
Southall—Paving and Making-up Hartington-rd. & Queen's-rd.	Southall-Norwood U.D.C.	Howard R. Felkin, Engineer and Surveyor, High-street, Southall	" 24
Catford, S.E.—Kerbing, &c., Laleham-road	Lewisham Board of Works	The Surveyor's Department, Lewisham Town Hall, Catford, S.E.	" 24
Halifax—Lowering Godley-lane	Improvement Committee	Edward R. S. Escott, C.E., Borough Engineer, Town Hall, Halifax	" 24
Dover—Australian Hardwood Paving, Granite Kerb, &c.	Town Council	Henry E. Stilgoe, A.M.I.C.E., Boro' Eng., Town Hall, Dover	" 24
Brockley, S.E.—Kerbing, &c., Holdenby-road	Lewisham Board of Works	The Surveyor's Department, Lewisham Town Hall, Catford, S.E.	" 24
Salford—Paving and Flagging Streets		L. C. Evans, Town Clerk, Town Hall, Salford	" 24
Fulham—Making-up and Paving Querrin-street	Vestry	Charles Botterill, Surveyor, Town Hall, Walham-green, S.W.	" 25
Cotford—Widening Cotford-lane		I. Lodge, Clerk to Sub-committee, Cotford	" 25
Withington—Street Works	Urban District Council	A. H. Mountain, A.M.I.C.E., Surveyor, Town Hall, Withington	" 26
Wareham—Alterations and Repairs to Footways	Town Council	G. C. Filliter, Town Clerk, Wareham	" 27
Glasgow—Street and Sewer	Corporation	A. B. M'Donald, City Engineer, City Chambers, Glasgow	" 27
Emsworth—Paving, &c., Station-road	Warblington U.D.C.	Frank Swinburne, Surveyor, West-street, Emsworth	" 28
Bath—Completing Kingshill-road, Upper Knowle		Spackman and Son, 6, Terrace-walk, Bath	" 28
East Grinstead—Making-up Charlwood-row, Durkins-road, and Wellington Town-road	Urban District Council	R. Wilds, Surveyor, Council's Offices, East Grinstead	" 30
York—Street Works	Corporation	Alfred Creer, City Engineer, Guildhall, York	" 30
Altofts, Yorks—Kerbing, &c., Church-road	Urban District Council	W. Wilkinson, Surveyor, District Council's Office, Altofts	" 31
Silloth, Cumberland—Flagging, &c.	Holme Cultram U.D.C.	George Armstrong, Architect, 24, Bank-street, Carlisle	" 31
Eastbourne—Paving Thirteen Roads	Highways Committee	R. M. Gloyne, A.M.I.C.E., Boro' Engineer, Town Hall, Eastbourne	Nov. 4
Alverstoke—Forming Paths, Ann's Hill-road	Burial Board	H. A. F. Smith, Surveyor, High-street, Gosport	" 6
Armley—Flagging Sixteen Houses near Carr Crofts		B. Anderson, Prospect House, Littlemoor-road, Pudsey	—
London, E.C.—Concreting (17,000 yards)		P. K., c/o Street and Co., 30, Cornhill, E.C.	—
Norden, Lancs—Kerbing, &c., Clapgate-road	Urban District Council	J. W. Sunderland, Surveyor, Church View, Norden	—

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MISCELLANEOUS PRACTICE.

WHETHER a multifarious practice has been favourable to architecture is a question that may be open to doubt. It was remarked the other day at the Church Congress that there can be no true revival of art until its close union with the Church is restored. "An architect who is quite ready to design a railway-station, a meeting-house, and a refreshment-bar," was said "to be incapable of designing a church that would impress with a feeling of religious awe and wonder those who worshipped in it." The unifying influence of the Church in the Middle Ages, by knitting together the arts of architecture and decoration, and employing them in her service, has no parallel in these days. The stream of art has broken up and flows in various channels. It is no longer the handmaid of a dominant faith; but architecture and the arts once allied to it are practised by men of all sorts of creeds and opinions. With this break-up came the application of art to a diversity of uses. The artist who could earn a living by superintending the erection of churches and monasteries, by carving corbels and bosses, by forging iron grilles, or by painting frescoes, is no longer in request. In his place has arisen the commercial decorator, who turns his head and hands to any kind of work he can find remunerative. The modern architect is the professional man who has to apply all he knows to any kind of building. The whole conception of art is changed. Those who have to write the architectural history of the nineteenth century will really have to write the career of a few professional men who have made their mark. There is no particular or national art to write about, if we except what has been called "revivals"—nothing that can be distinguished as a style or development of art. The proposition contained in the last sentence of the passage we have quoted may at least be worth thinking over—it affects all our modern work. The question it raises is this: How can an architect who undertakes a variety of commissions for buildings of very different uses do anything really good—any art that impresses, that obviously ennobles both the artist and the object? If an architect who is ready to design railway-stations and refreshment-bars is incapable of designing a noble church, how can we expect our professional architects to do anything well, or that shall be worthy of art? We leave the question to the attention and thoughtfulness of our readers, while we now discuss for a few moments a few of the issues. A few leaders of the profession are deluged with commissions; they hardly know where to turn for assistance. The work is varied—ecclesiastical, secular, domestic, commercial;—they undertake all, reject nothing. They cannot do all themselves: a great deal they delegate to others who may know a little of the kind of work—one to domestic work, another to church work, a third to public offices or to decorative design, and so on—an approach to the old way of letting one man do his own special craft. The employer of all this labour and thought secures his commissions, nets the profit, while his assistants supply the work, plus the brains; he acts just in the same way as a large commercial firm who undertake to supply goods. The weakness of this system is that the controlling mind cannot put his heart in the work, however able his assistants: they are acting irresponsibly, and, to a large extent, mechanically, as the credit of the design attaches to the employer. The executed building fails, the plan is faulty, the details are mechanical, the personality of the artist is not transmitted to the work. Even those men who, like the late Mr. Street or Mr. Pearson, tried to eliminate the assistant factor, cannot give due attention to the building as it progresses. But one of the worst points of the system is that hundreds of competent men in the ranks of the profession suffer. The "one-man" system of architecture is diametrically opposed to the co-operative system of the great guild. We need not dwell on this unfortunate condition of modern architectural practice; it handicaps our best endeavours.

Next we have the position of a practitioner who may be called the astute "all-round" man, represented chiefly by many a large provincial firm. He has no acquired reputation for any particular branch of his profession, except as an industrious business man. He accepts all sorts of architectural as well as surveyor's work, plans estates, superintends the roads and sewers, values house property for mortgage, assesses dilapidations, and undertakes the design of buildings, from stables to municipal offices. He, too, it may be said, because of his reputation, keeps the competent and able man out. He may obtain outside help occasionally; but, as a general rule, the busy man has a good staff of assistants and pupils, and to those are committed the various commissions that come in. In both these supposed cases able men, who are experts in one part of their profession and who have a true instinct for a particular class of work, are ousted, unless they have won a big competition. Even to take a few of our leading architects who have achieved a reputation as designers of churches—how many of them have confined their studies to this branch, but have, unconsciously perhaps, lost their reputation by dabbling in other work! We know one or two whose secular work has been anything but successful artistically. It may be argued, of course, that architecture is not confined to any particular class of building, and that we are justified in applying the art to every kind. For instance, it may be said, the architect who divides his attention between commercial, domestic, and public buildings of various kinds has a better opportunity of studying design in its many developments than he who confines himself to one or two branches. This kind of omnivorous practice helps him also in his profession, as it brings him into contact with clients who have different occupations and tastes; it gives him a wider range of sympathies with different styles, and, by thus varying his studies, makes him better able and more fully qualified to undertake work that is remunerative. What he gains in the versatility of his resources he loses in not being able to concentrate his attention upon one subject. He cannot study with a prospect of success any one branch—say, ecclesiology, or decoration, or hope to be learned in construction. On the other hand, he can turn his mind with greater quickness of perception to the general requirements of buildings than the man who has occupied his best time in one branch—one who is learned and fond of deep research. Close attention to one subject seems to incapacitate him for a rapid change of thought or business transactions. It would be easy to adduce instances of this kind of inaptitude among learned men, authors, great artists, and archæological students. Depth in one subject is often accompanied by a slight acquaintance with other matters. All very true; but when we appeal to practical results, the advantages of a general, all-round knowledge are not so readily perceived. Art is exacting, and only a close and unremittent study of it directed to one kind of object is rewarded with success. It is the same with painting, literature, music, and every form of artistic expression. All great painters, authors, and musicians have given themselves up unreservedly to the pursuit of their art;—it has been absorbed, so to speak, into their very thought and life; and the greater the master, the more dominating has been the influence and aim of his efforts. If any doubt, let him turn to any of the great schools and periods of art — Classical, Mediæval, or Renaissance — or to those individual masters that have made a name in modern times. Their work has all had a direction; their reputation has always been gained by pursuing one branch of their art. Modern art is leading in this direction. For a time it was hetereogeneous and confused; architecture is still largely eclectic in its preferences, yet we do not lose hope that at no distant future the very causes from which art has suffered the most may become instrumental in its restoration to unity, when the maxim "Divide and co-operate" will be the watchword of the architect and craftsman.

SOCIETY OF OIL-PAINTERS.

A HIGHER quality of work and better hanging than we have been accustomed to see of late distinguish the exhibition just opened in Piccadilly. With the well-matured handling of old members and the vigour of execution of a few painters, whose work commands attention in this exhibition, we notice several works by younger men, some quite new, which give much promise; amongst them are a few examples of that experimental school which tries, often unsuccessfully, to give us their own impressions of nature, or to record what they think, not what they see; but this school of painters can only find an appreciative public when they combine and exhibit their works together. The Society has, this time at least, been able to secure the work of a few painters who give us subjects and motives to think about, and one or two conspicuous works of this kind are hung. One or two works after the manner of French Realism are hung; these are often strained to produce effect.

J. L. Pickering's work is always fresh, and healthy in colour. "On the Senny, Brecon" (2), is a charming autumnal landscape, the cattle on the margin of the river beneath the shadow of trees and the distance are effective. His "Byres" is also strong, and brilliant in colour. Soft and mellow is Tatton Winter's "Day's Ending," and we also find in R. Thorne Waite's "The Day's Work Done," his usual ability in delineating country life. Here we have horses refreshing themselves at a brook after the day's labour—full of feeling, and sympathetic. His only other subject, "The Brook" (16), is worthy of his craft. Miss Margaret Cornish is a delightful painter of flowers, and her "Roses" (10) is painted with much feeling. We have never seen anything better than Edgar Bundy's picture, No. 13, the entrance-hall of an old hostelry, such as was in existence early in the century. A gentleman, a well-known visitor, has just dismounted from coach and stands surrounded by the comely hostess and her winsome daughters, who are helping him to divest himself of his overcoat. He displays a buttoned-up swallow-tail coat open, showing a white neckerchief, light pants, and top boots. He extends his arms to the two daughters of the house, who are pulling at the sleeves. Another maiden is overladen with furs and rugs, a smirking waiter stands in front of the guest full of smiles and welcome, and up the massive staircase, with its handsome carved balusters, a porter is seen carrying a big trunk. All the accessories are delightfully painted, and

Mr. Bundy has well caught the sentiment in the lines—

> Whoe'er has travell'd life's dull round,
> Where'er his stages may have been,
> May sigh to think he still has found
> His warmest welcome at an inn.

The colour is brilliant, and the painter's technique masterly. Another clever piece is "Smugglers" (238). In a confined cabin or hut near the sea, which appears outside, two men are preparing for an arrest. They have guarded themselves with firearms. The drawing and colour are both vigorous. Terwick Williams is a master of the sea and coast. "Putting Off to the Boats, Folkestone" (14) is a scene in the old harbour, where boats and craft are moored. Nothing can be more truthful than the sunlight effect upon the rippling water surrounded by the dark quays and craft against the misty light. "The Quay Side, Rouen" (330), with the reflection of light on river, is equally strong in the handling and colour. As a painter of cattle, Horace Mann Livens ranks high. His work "Cattle in the Meadows" (12) and No. 18 are painted with considerable power. The grouping of the cattle and the gleams of sunlight, which fall though the openings of the trees, give life and strength. The vice-President, S. Melton Fisher, sends two or three clever studies. One is a Venetian courtyard (19) pleasing in the colour and graceful in the figures; another (274) a study of a head of young lady in mourning is delicate in the features. The black hat and veil are in accord with the pallid and expressive face. Black is a very trying colour, but this is toned down to a warm neutral hue. The pictures by Herbert Royle "Evening" (21) and Dudley Hardy's "Low Tide" are both broad and in low tone. W. P. Frith, R.A., has a graceful study of a young mother carrying her child, "Bed Time" (26); and Edwd. F. Brewtnall has a clever and humorous subject, a scarecrow in a sown field, before which a flock of black birds has defiantly gathered (29). One of the few impressionists, Stuart Hobkirk, has a study of sunlight and shadow in "The Flower Markets in Paris" (31), and Henry J. Stock's weird and imaginative subject, "The First Morning," is more impressive than edifying—whirling masses intended to represent flame and lurid smoke, an episode of the Creation. Pictures of incidents are numerous. "Rivals," by Fred Roe (39), is a clever interior. The gentlemen are both trying to address the lady, who in charming manner is rather embarrassed by the new comer. J. A. Fitzgerald paints (45) an elderly recluse or monk with a large volume before him, "An Impressionist." He has laid it down, and is in a half-doze, trying to obtain an impression. Miss Hilda Fairbairn's "Motherless Bairns" (47), a little fair girl with a baby in arms, in a dreary street, is tender. In the centre place, George William Joy sends a portrait of a little girl standing on a step in a garden, with landscape behind. It has character and strength, if a trifle hard. His "Pixies" (284), and "A Kelpie" (319), are more fanciful and clever as studies of water-sprites. "In a Cornish Cottage," by Harold C. Harvey (42), is a touching study of young married life, and we must praise the breadth and nice tone in James S. Hill's "Village Road" (43), with its cloudy sky, and his "Summer-Time" in East Gallery with its pearly tone (435). Julius Olsson is still an impressionist. His deep blue sea in a "Cornish Headland" (49) is refreshing amidst many things of conventional taste. "Meadow Grass, Amberley," by E. G. Warren, is handled in this painter's finical manner. T. B. Kennington still gives us classical subjects. His "Lady in Comus," in white drapery, in the wood, is a fair dream of womanhood; and his "Zuleika" is a gorgeous and brilliant rendering of the "Bride of Abydos," a beautiful and virtuous daughter who dies of a broken heart because her father shoots her lover. With this exception there are no classical themes of any merit on the walls. John Fulleylove contributes several subjects. "The Garden of the Cardinal" (66) is a charming piece of Italian gardening. "The Views of the Devil's Punch Bowl" (159) are of interest.

The incident from "The Old Curiosity Shop," by William J. Farrow (68), where Mr. Swiveller is playing cards with the Marchioness, is spirited. We must pass hurriedly over Niels M. Lund's "Departing Autumn" (75), a forcible landscape under a stormy sky; Sidney Moore's "Quiet Afternoon," a mellow woodland; J. T. Nettleship's "Youth" (80), where a tiger, serpent, and a beautiful maiden are in reposeful innocence; Alex. Mann's shadowless "Summer Afternoon" (84), Ernest Parton's "St. Martin's Summer" (88), to notice Claude Haye's large and powerful picture of "Winter," two carthorses outside a country stable. We can almost realise the bleak, cold, dreary atmosphere of a winter's day and the snow-covered ground. One note of human sympathy is the waiting, patient horses—these impart pathos to the scene. Harold Knight's inimitable "Fish Sale" (97) is also full of atmosphere and freshness. The group of fisherfolk by the rough sea is vigorous and truthful. J. C. Dollman sends a small, but amusing subject: an old country gentleman reprimanding a small boy of the village for drawing a caricature of himself in chalk on his gate. The youthful "Village Genius," as he is called, has been caught in the act. The chalk likeness is sufficiently good to arouse a smile. His other work is "Nothing Doing," a highwayman in a deserted road looking out for prey. One other subject picture, by W. A. Breakspeare, called "Fading Flowers" (114), claims attention. We see the fair form, head, arm, and shoulders of a young lady in low dress resting on a table on which are scattered a number of roses. She is tired, and has gone to sleep—it may be after the ball—while her youthful husband is drinking a glass of champagne. Beyond one sees another room curtained off, in which has been a lavish spread. Waiters are engaged clearing up, while the light of early dawn is seen. The explanation of the painter's intention is not apparent, but the subject is out of the common, and the handling, technique, and colour are good. Anderson Hague's work, "After a Shower," is a strong, vigorous piece of colour. The ruts of rainwater in the lane, and its cottage and grey atmosphere remind one of a Scotch village.

In the Central Gallery we first notice Byam Shaw's quaint and remarkable composition, "A Protest"—the interior of a well-furnished room, where a lady, seated before her looking-glass with hand-mirror in hand, is deftly applying a pink powder to her cheeks. Her maid stands beside her. In front is a little fair-haired child engaged in painting a bunch of roses. The protest appears to be aimed at the painting of nature. What else does it mean? It is full of the master's powerful personality, quaint and almost grotesque in execution, but suggesting a moral. It is, at least, a picture to talk about. A. D. Peppercorn's "Evening at Sea" (155) is masterly. The president's (Frank Walton) chief work is a fine woodland, "In the Hurtwood" (285)—a pinewood on rough, sandy hillocks, with a few sheep in the foreground. It is needless to say how truthful and faultless in execution it is. The colour, is brown and subdued. Three smaller landscapes—one "A Meadow" (289), with deep grass and overhanging trees; "The Promise of May" (283), and "Afternoon" (285), a pretty homestead and meadow —are delicate in tone and colour. Sir James Linton has a pleasing study (204) of a lady in rich-toned silk sitting by an open casement window, anxiously waiting for, it may be, her lover.

John A. Lomax tells a little domestic story in his own charming way—"A Little Game of Backgammon," played between an old gentleman and a young man. The winsome expression of the daughter, whose eyes are on the young player, and the pleased countenance of the former make a pleasant picture. The table, fireplace, and details, are carefully painted. W. Douglas Almond has also a clever piece of *genre*, "At the Virtuoso's (196), where a young lady is trying on a green scarf or shawl before her *fiancé* and an elderly dealer, and Carlton A. Smith's, a figure of a little girl in red, "Ready for the Dance" (200), and a decorative subject, "The Annunciation," by E. Reginald Frampton, may be noticed; also Arthur Hacker's thoughtful and pleasing face of the young maiden leaning her head on her arms in a reflective mood called "Day Dreams." Robert W. Allan has not done anything much stronger in colour and vigorous than "After Rough Weather," a coast scene with damaged boats; and certainly nothing more fresh and sea-like than "Dutch Fishing Boats" (481), with the wet quays and boats in low tone. Brilliant in colour and light is John R. Reid's "Lucky Little Angler" (247), and we notice a fine seascape by Edwin Hayes, a "French Lugger making for Dover Harbour," admirable in colour and freshness. "Bon Jour," by Isaac Snowman, is a pretty study of a young girl, beaming with smiles, arousing herself from sleep on her bed. Near to it W. W. Pike has a Venetian fruit and flower market, brilliant in colour. St. George Hare's circular picture, "The Shrine of Eros," is a composition in which there is movement of the dancing maidens and rich colour, and we must not omit J. W. T. Manuel's studies of football, exaggerated in action.

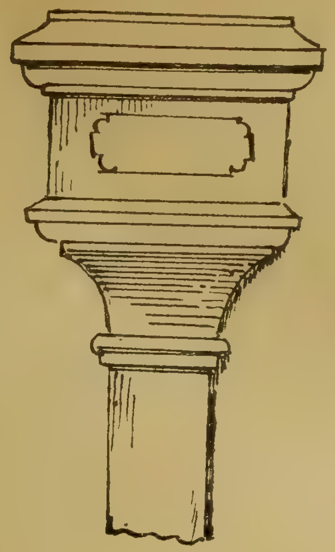
The East Gallery contains about a dozen good pictures, and a great many more that might have been spared the gaze of critics. Hugh Carter's picture of "The Smithy," has breadth of light and shade, but rather soft in tone. A portrait of "An Old Master of the Edinburgh Merchant Company," by Sir George Reid, P.R.S.A., is strong in handling and individuality; and Miss E. Steward Wood has a pleasing study of figures in "Meadowsweet" (341). Landscape is strong in this gallery. Charles I'Anson's large heath, Dorset, has a good atmosphere, and Leslie Thomson has a view of Dartmouth, excellent in colour; but one of the best landscapes is E. M. Wimperis's fine view of "Richmond, Yorkshire" (419), a wooded valley between hilly slopes and an expanse of scenery, in his broad style, excellent in colour. Alfred Hartley has a nice sunny effect in "The Garden Seat" (362), and Gabriel Nicolet a view "At Versailles"—the avenue and reflection in water are graceful. There is a breezy and clever seascape by Edwin Hayes, R.H.A., showing "Italian Fishing Vessels off the Faro Lighthouse," forcibly painted, with a command of colour and handling. One of the few daintily-painted figure subjects is Sir George Hare's pretty dark girl, dressed like a nurse in dark blue and white strings to her bonnet, with a bunch of roses. There is grace of draughtsmanship in the figure, with its fascinating face. Stiff, and rather cold in the colour is S. E. Waller's large centre subject picture "The Huntsman's Wedding," showing the bridal pair walking down a garden path to the roadside, where huntsmen in scarlet and dogs are waiting. We pass by a strong and vigorously painted view "Iford Bridge," by Anderson Hague (390); a "Haunt of Ancient Peace," an old manor house in its natural seclusion, by Helen Margetson; a graceful study of girl and child in meadow, by A. W. Bayes (384), and W. B. Wollen's large and brilliantly painted subject "After Naseby," depicting victorious cavalry returning—full of life and movement. Grace and dignity characterise the thin quarter-length figure of a handsome maiden in low bodice, reading a missal with clasps, by G. Nicolet; a note of colour is the light blue silk cloak she carries on her arm and the red edges of the book. The vice-president has happily caught the colour and glamour of a Venetian moonlight in his view of the Madonna della Salute (427). A powerful and weirdly fascinating subject (444) is sent by J. T. Nettleship, depicting a prairie on fire. A host of wild animals —one a tiger carrying her young — are making a hasty retreat, all hustling together by one common instinct. The hapless beasts are painted with much skill and knowledge. Among other works of interest are pictures by W. Shackleton, a study of brilliant colour, but rather unintelligible; "A Bit of Old Canterbury," by Vincent P. Yglesias (486); Chas. A. Buchel, a clever figure study (499); Miss Eva Branston (506); and Edward P. Porter's clever little incident, "Overtaken."

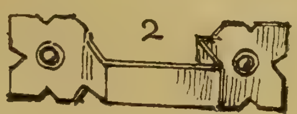
ESTIMATES.—XXVII.

RAINWATER PIPES AND OTHER CASTINGS.

In this article we deal with a number of castings, such as rainwater-pipes, area gratings, iron staircases, air gratings, register or patent grates. Rainwater-pipes are fixed, by means of lugs or ears cast on the pipes, at a slight distance from wall. The joints should be caulked with red-lead and tow, and the pipe tarred inside. The rectangular pipes are best fixed by separate bands. Often they are fixed by means of ears cast on. In specifying, the weight in pounds per foot or yard should be stated. Thus 3in. pipes should weigh about 12½lb. per yard, a 4in. pipe 18lb. It should also be mentioned what length, if 6ft. or 3ft. length. Guttering also should have the weight specified. Half-round 4in. gutters ought to weigh 6lb. per yard, and 5in. 8¼lb. Ogee moulded gutters would weigh from 10lb. to 12lb. or 14lb. per yard. For ornamental or moulded guttering quote number and price from list or give sketch. Messrs. W. Macfarlane and Co., of Glasgow, Messrs. Young and Marten, Stratford, manufacture and supply high class goods of this kind from the lowest to the highest price. Rectangular pipes may be had for a little more than round. A pipe 3in. by 3in. costs about 2s. 6d. per yard, or about 10d. per foot; a pipe 4in. by 2in. may be got for 3s., or 1s. per foot. Bands or ears, as sketches Nos. 2 and 3, may be had for 2s. or 2s. 9d. each. Heads, of square or rectangular plan, may be priced from 6s. to 12s. each, but special designs by the architect would cost more, as much as 18s. to 30s. per cwt., according to pattern and number required. We have seen some good patterns copied from old cast lead work at about 16s. each. Iron railings vary much in price according to pattern; consult such lists as those of Young and Marten. For stoves, grates, and ranges special lists are obtainable from such firms as E. H. Shorland and Brother, Manchester, and others. The Manchester school-grate is well known, and rooms of 2,000c.ft. and over can be fitted with grates that cost £2 10s. to £4. A great many varieties of register grates are in the market, and the prices vary according to width and finish. Grates can be had at very moderate prices from 21s. 6d., 15in. wide, to £2 10s, according to finish. More expensive canopy grates, with 18in. fire, range from 45s. to £3 15s., and more. Tiles and repoussé brass and copper panels are extra.

Cast iron in girders and columns, exclusive of patterns and fixing, but including cartage and profit, may be priced at about 9s. to 11s. per cwt. For fixing, add 1s. 6d. per cwt. King and queen-heads, and abutments for principals, may be priced at about 9s. per cwt. Any ornamental castings, like railings, panels for balconies and windows, stairs and verandahs, would cost from 12s. to 18s. per cwt., according to pattern. Rain-water pipe-heads may be taken at from 18s. to 25s. per cwt.

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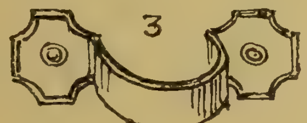
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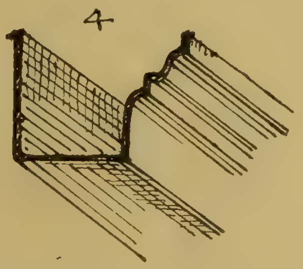
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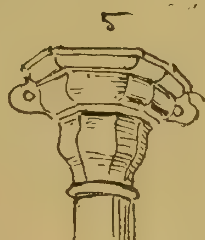
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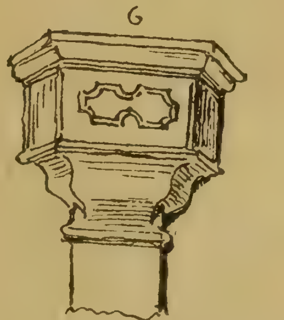
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In pricing cast-iron work, the patterns must be taken into consideration; most items include them. Ornamental ironwork like iron railings, staircases, balconies, panels, should have a sum provided, based on an estimate from an ironworker.

For constructional cast-iron work, grey cast iron No. 2 or three is used; No. 3 is adapted for heavy castings. For delicate castings, grey cast iron No. 1 is better adapted: it is soft and fluid when melted.

Our sketches illustrate rain-water pipe-heads, ears, and moulded gutter.

RAINWATER GOODS.

150ft. 5in. half-round eaves gutter, jointed and bolted in red-lead cement to fascia, on strong wrought-iron brackets.

	£	s.	d.
Cost of gutter at 10d. per yard, per foot, say	0	0	3½
Half-round gutter brackets (2 to 6ft.)	0	0	1½
Bolts and red-lead cement, per foot	0	0	1
Fixing	0	0	3
Per foot	0	0	9

Gutter brackets for 5in. gutters cost about 32s. per gross.

No. 8. Angles and fixing to ditto.

These cost about 10½d. each, and fixing, say, 1s. 3d.

No. 2. Nozzles to ditto.

These would be about 10d. each.

No. 2. Stopped ends.

These are about 3½d. each.

145ft. run. 3in. rainwater pipe and fixing.

The cost of 3in. rainwater piping is about 10d. per yard; say 3½d. per foot in 6ft. lengths. Pipe nails for fixing are 3d. per dozen.

	£	s.	d.
Say, cost of gutter per foot	0	0	3½
Fixing and pipe-nails, say	0	0	3½
	0	0	7

No. 3. Swan-neck bends, 6in. projection.

These are about 1s. 9d.

	£	s.	d.
Extra on the pipe, say, each	0	0	10
Fixing	0	0	4
	0	1	2

No. 1. Elbow ditto.

Say 2s. 6d. to 3s.

No. 2. Heads for ditto. (See sketch 5.)

These are priced at about 1s. to 1s. 1d. each. Heavy ones would cost 1s. 6d. to 4s., according to design.

145ft. run. Rectangular, 4in. by 3in., r.w.-pipes, and fixing in 4ft. lengths.

These are about 2s. 4½d. per lineal yard in 4ft. lengths; heavy ones about 3s.

	£	s.	d.
Say, per foot	0	0	10
Fixing &c., per foot	0	0	4
	0	1	2

No. 2. Heads to ditto, according to design. (Sketch 1.)

These would cost about 5s. to 6s. each. Special heads are made at about 10s. each.

No. 2. Shoes to ditto.

Price these at 2s. 3d. each.

No. 3. Elbows to ditto.

Put these at about 3s. 6d. each

Making four connections.

These are generally taken at equal to 2ft. length of pipe—say, 1s. 8d. each.

Provide and fix a rainwater separator for storing rain water, complete, supplied by C. J. Roberts, Haslemere, for a roof of 3,500ft. superficial.

For this size of roof a separator would cost £7 10s. at factory; add for carriage. A discount of 20 per cent. is allowed.

1ft. run. 5in. by 3½in. moulded eaves gutter, No. 38 Macfarlane (Glasgow), jointed and bolted in red-lead cement, and fixed with screws.

The price of this is 11d. per foot.

	£	s.	d.
Cost of gutter, per foot	0	0	11
Fixing	0	0	3
Red-lead cement	0	0	0½
Bolts and screws	0	0	1½
Per foot	0	1	4

No. 4. Angles to ditto.

Deducting the return lengths from angle, the cost extra would be about 1s., and fixing bolts, &c., 8d., say 1s. 9d.

No. 2. Outlets.

Price of outlet would be about 1s. 3d., and fixing, bolts, &c., 8d,, say 2s.

No. 2. Stopped ends.

These put at 9d. each.

No. 2. Swan-neck bends, 24in. projection,

	£	s.	d.
Extra cost of bend over pipe, say	0	4	0
Labour on ditto	0	0	8
	0	4	8

75ft. run. 7in. by 6in. moulded eaves-guttering, as per section given, screwed to fascia and fixing (see sketch No. 4).

The cost of this may be put down at 4s. 2d. per yard, delivered on works, or—

	£	s.	d.
Cost of guttering, per foot, say	0	1	4
Cost of screws and red-lead putty, per foot	0	0	1½
Fixing, per foot	0	0	3½
Per foot	0	1	9

No. 2. Outlets to ditto.

	£	s.	d.
Say, extra cost	0	2	6
Bolts, &c.	0	0	2
Labour, fixing	0	0	6
Per foot	0	3	2½

No. 2. External angle.

	£	s.	d.
Extra on guttering, say	0	1	9
Bolts and labour fixing	0	0	8
Per foot	0	2	5

No. 2. Obtuse angles (external).

Put these at 3s. 6d. each.

No. 4. Corner plinth offsets to r.w. pipes, 9in. projection, 5in. by 4in.

These are priced in Young and Marten's list at 8s. 3d. each.

No. 12. Ornamental rectangular ears to r.w. pipes, 4in. by 3in.

The cost of these depends on the design. They vary according to size of pipe. Put these down at 1s. 9d. each. Any special design would cost more, and include the pattern.

No. 3. Heads to r.w. pipe, 4in. by 3in., according to design. (Sketch 6.)

If made according to a special design, there is the cost of pattern which may run into, say, 20s. or more, which would have to be added to the usual price. The pattern shown will run into 10s. to 12s. each. The best plan is to obtain an estimate from the founder, who may, in some cases, be able to alter a pattern that would suit, as there are only a small number. A large ironfounder keeps pattern-makers on the works, and is, therefore, able to cast special designs at small cost. Add to the above price, fixing, &c., if not taken with r.w. pipe.

CAST-IRON WINDOWS, AIR GRATINGS.

No. 4. Double-swing cast-iron window for stables, 3ft. 3in. square, and fixing.

Hayward Brothers and Eckstein supply a window of this size at £1 4s., and fixing to wood built in wall, say, 4s.

No. 4. Ditto cast-iron sash and frame, 3ft. 3in. by 1ft. 8in.

This is priced at 12s. each.

No. 2. Cast-iron window sashes, with cambered heads, 3ft. 6in. wide by 4ft. 4½in. high.

Consult Young and Marten's list. This size, the cost would be about £1 each.

No. 12. Cast-iron ventilating air-bricks, 3in. by 9in.

These cost from 3½d. to 6d. each, fixing, say, 3d.; if galvanised, double the price.

No. 4. Cast-iron double air-bricks for ventilation, 9in. by 6in.

Say, 9d. each.

No. 3. Hayward's manhole covers and frames, 18in. by 24in.

These are priced at 13s. 6d., and add for fixing, say, 2s. 6d.

Provide and fix a strong area grating, 3ft. by 2ft., and ⅞in. thick.

These are quoted in Young and Marten's catalogue at 17s., fixing, say, 3s.

No. 2. Hayward's improved safety coal-plates, 21in. diameter.

These are 14s. 6d. each, if illuminating, 18s. 6d.; add for fixing and cement, 2s.

No. 2. Hayward's patent semi-prism pavement lights, complete, of approved design. and of the dimensions on plan.

Obtain quotations from makers. The price will depend on size and thickness of bars. If of stock sizes, say, 7s. 6d. per foot super.

No. 5. Cast-iron balcony panels, 3ft. 1in. wide and 3ft. high, with lugs for fixing on stone landing.

If these are to a special design, a price should be obtained. Very good balcony panels are supplied by some ironworkers, suitable for this width, at 18s. to 30s. each, exclusive of fixing. Ornamental panels are also made about 30in. high, at 5s. and 6s. per foot.

No. 22. Cast-iron balusters for iron staircase.

The price for this will depend on design. Stock patterns can be had, 9d. to 2s. 6d. each; the latter are ornamental.

Provide and fix No. 10 bedroom grates, 14in. fire, and of approved design.

The price is according to finish. If "second finish," ground front, and Berlin blacked, the price may be put at 1s. per inch. If the grates are, say, 30in. wide, they would be about 30s. each. This would be a fair price for bedroom register grates. The "best finished" would cost about £3 each or more. The bricklayer generally sets the grates and ranges, and provides the necessary bricks, fireclay, and other materials.

IRON STAIRCASES, ETC.

Provide and fix to satisfaction of architect one of Hayward Brothers and Eckstein's (Union-street, Borough) improved circular iron staircases 5ft. 6in. diameter from first to second and third floors.

It would have been better to have put down a p.c. sum for this, or obtain a quotation from firm. A 4ft. diameter staircase is quoted at 23s. 6d. per foot rise. If the height is 12ft. from floor to floor, the cost will be £14 2s.

	£	s.	d.
Say, cost of spiral staircase, two flights	28	4	0
Handrail to well-hole at top, say	2	0	0
Fixing, &c., say	1	5	0
	31	9	0

The item for fixing will of course depend on the kind of floor, the trimming of floors, and other carpenter's and joiner's work, and therefore no fixed sum can be stated. Generally the design of staircase is selected by the architect, and a prime cost value is stated at so much per step.

THE ARCHITECTURAL ASSOCIATION OF IRELAND.

THE annual general meeting of this Association was held, on the 18th inst., in the Grosvenor Hotel, Dublin; Mr. George P. Sheridan, A.R.I.B.A., presiding.

The Hon. Secretary (Mr. Henry Allberry) read the annual report, which showed that the membership now numbered 111. In moving its adoption, Mr. Ross said the progress of the Association had been well maintained, and he hoped the non-attendance of junior members at classes, referred to in the report, would be more than made up for this year. In Ireland they suffered very much from the want of professional classes for instruction; but one of the objects of the Association was to provide classes for the members. Mr. Walter Doolin, in seconding the resolution, said a number of young persons, who in the beginning were too noisy to join it, were now its most zealous supporters. He exhorted them not to join themselves with any other institute. Let the Architectural Association be clear and independent of all others.

The treasurer (Mr. Webb) laid before the meeting the annual balance sheet, which showed an increase of £12 6s. 8d. in the amount carried forward as compared with last year.

The President read the inaugural address. Having reviewed the work of the association since it was founded, he proceeded:—The success of the association as an educational body depends on the individual volition of the members. If they wish it to succeed, no doubt it shall succeed. If they conscientiously try to participate in the advantages to be derived from the work and aims of the association, they will benefit themselves and raise its status and representative character. Perhaps of all the classes, the sketching and measuring class is the most important. We all know sketching is inseparable from an architect's education—how it trains the eye in proportion and judgment, concentrates the attention on detail, and assists the mind in understanding and recording the effects produced in deceased architecture. My anxiety to impress on you the importance of participating in our society's work resolves itself into a warning to the younger members to guard against any tendency towards retrogression; as likely we may be at a turning-point in the life of the association. After experiencing the first flush of enthusiasm, a reaction may set in, the earnestness cool off, and apathy take the place of worthy effort unless men are awakened to the advantages held out to them, and to the benefits to be derived from a system of architectural education—supplemental to office work—and well suited to assist in an effective training of the hand and mind. What are the advantages of this education I have been so constantly referring to? How does it influence an architect who has to earn his living by superintending the moulding into material form, the creations of his fertile imagination? Well, there are, perhaps, many advantages, as, for instance, expression and expertness in design, the power of knowledge, insight into possibilities of further research, &c; but an advantage I place above these and which these must lead up to is the development of a mental condition which seeks to investigate what architecture is and endeavours to understand why certain forms are beautiful and why varied emotions are excited in the contemplation of different buildings. In order that an architect might be able to create an architectural composition to give pleasure to those who shall behold his work, he should have knowledge of some of the causes which influence appreciation. Architecture depends a great deal for its attribute of beauty in the manner in which it occupies space, and it is not dependent on ornamentation, and consequently architectural beauty for the most part consists in the due proportion observable in the outline of a building and its several parts. Colour, to a certain extent, adds beauty to architectural works, but in order that it should do so, it must have the character of necessity, and not of having been adopted for the sake of ornament alone—contrast a red brick building with one that is painted brick colour. The knowledge of the nature of materials and their adaptibility to the uses for which they are employed also influences ideas of beauty. The history of architecture in its archæological sense is a history of the progress of man's knowledge of the use and nature of building materials. This is noticed in the gradual lengthening of the column in proportion to its thickness, which we observe in the Greek and Roman Orders. And when experience taught what the arch in Gothic architecture could sustain, the span grew wider and wider until the Tudor arch was evolved. And the qualifications of the materials in any country to some extent explain the peculiar characteristics of its architecture. Again, a building to be beautiful must give us the idea that it is able to withstand the injurious agencies of nature, which are always tending to destroy it. It should appear stable and not top-heavy, and that material which appears the most lasting to some extent affects the mental condition forming ideas of beauty. The emotion of the sublime may be excited by the size of the building. If of great height, the feeling may be that of fear of the pile falling, but this feeling might be caused by a somewhat similar condition in nature as by a high perpendicular cliff. But the emotion of sublimity produced by buildings of architectural merit arises when we reflectively connect their existence to the mind that conceives them, and to the mental effort of guiding the progress of the work. The difficulty with which we know an architectural work to have been accomplished, perhaps, adds still more to the emotion of the sublime. A certain amount of recurrence of the same effect in a building gives us an idea of sublimity, because it suggests the whole edifice is the effect of one single conception in the architect's mind. Beauty in effect is added to a building when it expresses the uses for which it was erected. Each generation has not the same knowledge nor desires as the preceding one, and each age has its special footprints and its special character stamping the architecture of the period with the general aspirations of the community. We are always changing, always moving onward, and so architectural judgment is likewise influenced. In this very practical and material age the fine arts are considered as something apart, and not as an embodiment of the public mind, as in epochs past. And it is difficult to say in how far the work of to-day repeats architecturally the aspirations and characteristics of the time we live in.

What is the dominant note to which modern architecture is atuned? What harmonies in modern life are carved and expressed in material shape? What new cult is attracting devotees and imperceptibly influencing the public mind? In this restless age, when the spirit of keen competition creates a feverish desire for change and novelty, it is very difficult to point in what direction the tendencies of to-day appear to be drifting. But, perhaps, I may not be far astray in suggesting that a "studied simplicity" is apparent in the motives of modern life. It can be traced through the different phases and conventionalities of our every-day existence. People assume a virtue if they have it not in the simplicity of manner and address, and decry the extravagances of a former generation. They will reject with affected disgust the ornate and massive, and display a ready preference for the opposite, though it borders on the crude. Great wall surfaces without any counterbalancing and contrasting features are thrust at us, or perhaps a strip of sculpture is crudely planted on which has no meaning in the unity of composition. Entablatures are distorted, and the parts perhaps interchanged in a way calculated to make you reflective, if not sad. Columns are attenuated and appear without a base, or are finished with a sickly roll in lieu of a cap; or, again, are distorted with an appalling entasis associated with an ill-used bolster, and perhaps are laden with rustications to such a pronounced effect as to produce the appearance of a scarrified salmon. But my references are only in a general sense. Excellent work is done now, and which may well be said embodies the true and beautiful in a way which demands our admiration, and in which departures are made from proportion which for generations had been accepted as fundamental in good design, and in which originality is not defined so much by novelty as by a modified adaptation of precedent, carrying with it respect for that which has gone before. Simplicity, with the authors of these works, meant repose and unity, and restraint and truth. They introduced ornament where ornament spoke to you most, or omitted it where truth could best be expressed without it. These men are working up to high ideals. They make the sciences subservient; they are not afraid to accept the advantages which science empowers them with, as they understand it is only knowledge which can be viewed and considered architecturally. They consulted the past for suggestion, and understood the feelings which moved the early architect who, as Smiles, in his book on "Duty," says, "Put their spirit into their work; they put religion into their work. Their architure had life, and truth, and love, and joy in it. It was chiselled music."

On the motion of Mr. R. Caulfield Orpen, seconded by Mr. R. M. Butler, a warm vote of thanks was passed to the President for his address.

THE EFFECT OF SALT WATER ON CEMENT.*

By A. S. Cooper.

THE present article, while not pretending to go as thoroughly into this subject as others have done, will give the results of some experiments which will go far towards settling a few points in this much-disputed question. In cold climates it is a general custom to put salt in the gauging water to prevent the mortar from freezing before it is placed in the works; and on the sea-coast it is often customary to gauge cement mortar with sea-water rather than go to any extra expense to obtain fresh. The experiments given in this article were designed to determine whether or not this is good practice, and also to ascertain the effect of sea-water on concrete structures. It was the intention to have them extend over a period of several years, but as circumstances interfered with the long-time tests, they were discontinued at the end of one year. They are, therefore, of very little value as showing the effect of sea-water on engineering structures, but show conclusively the ill effect of salt in gauging mortar.

DESCRIPTION OF TESTS.

Briquettes were made in moulds of the form recommended by the American Society of Civil Engineers in 1885, and the mortar rammed into them by a German hammer machine, striking 120 blows on each briquette, using about a 3lb. hammer and a 10in. drop. The mortar was made as near a standard consistency as possible, water being added until it just appeared below the moulds, when the hammering ceased. All briquettes of like mixtures were gauged with the same percentage of water. The mixing was done with a Riehlé mixing machine, using about 100 turns. Proportions were determined by carefully

TABLE I.—Showing Results of Tests made from One Sample of Portland Cement, to determine the effect of Salt Water used in Gauging and for Immersion.

Sand.		Water.			7 Days.			28 Days.			3 Months.			6 Months.			1 Year.		
Kind.	Ratio to 1 of Cement.	Per cent. to Dry Ingredients.	Gauging.	Immersion.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.
Standard......	1	8·9	Fresh	Fresh	2	544	6,779	2	574	7,980	2	671	7,734	2	833	9,658	2	846	9,485
do.	1	8·7	Salt	do.	2	585	6,340	2	621	6,808	2	801	7,850	2	820	10,188	2	819	8,465
do.	2	6·7	Fresh	do.	2	487	6,484	2	560	7,200	2	581	6,332	2	627	7,580	2	587	7,660
do.	2	7·8	Salt	do.	2	458	5,666	2	507	5,876	2	580	7,175	2	630	7,362	2	614	6,850
do.	3	7·8	Fresh	do.	2	278	3,038	2	335	3,235	2	438	4,602	2	444	4,180	2	431	3.594
do.	3	7·8	Salt	do.	2	303	2,666	2	330	3,587	2	391	4,025	2	408	4,325	2	344	4,020
do.	5	7·2	Fresh	do.	2	182	1,478	2	221	1,606	2	242	2,354	2	252	2,092	2	252	2,250
do.	5	7·3	Salt	do.	2	135	982	2	183	1,368	2	212	1,850	2	216	2,18[illegible]	2	243	2,288
¼ River ...... ¾ Beach	1	10·0	Fresh	do.	2	434	—	2	571	4,981	2	674	4,932	2	657	9,131	2	636	9,040
do.	1	10·1	Salt	do.	2	479	4,378	2	535	6,679	2	637	6,875	2	662	8,618	2	—	—
do.	2	9·3	Fresh	do.	2	285	3,475	2	350	4,175	2	413	4,775	2	447	7,175	2	505	7,134
do.	2	9·7	Salt	do.	2	339	4,025	2	405	4,017	2	439	5,425	2	459	6,194	2	487	5,630
do.	3	9·3	Fresh	do.	2	193	2,012	2	236	2,736	2	317	3,570	2	312	4,395	2	324	3,880
do.	3	9·4	Salt	do.	2	210	1,812	2	260	2,500	2	304	3 250	2	323	4,400	2	326	3,930
do.	5	9 3	Fresh	do.	2	120	1,100	2	135	1,468	2	211	1,970	2	222	3,200	2	198	2.140
do.	5	9 4	Salt	do.	2	136	1,000	2	155	1,294	2	194	2,025	2	199	3,965	2	208	2,396
Standard......	1	9·4	Fresh	Salt	2	568	6,502	2	709	7,256	2	670	6,640	2	708	7,655	2	625	8,706
do.	1	8·7	Salt	do.	2	618	6,436	2	631	6,325	2	660	6,462	2	610	7,700	2	318	7,107
do.	2	7·3	Fresh	do.	2	477	5,419	2	586	6,590	2	600	5,678	2	637	7,461	2	471	7,171
do.	2	7·7	Salt	do.	2	492	5,750	2	554	6,557	2	583	7,606	2	589	7,605	2	478	5,900
do.	3	7·3	Fresh	do.	2	329	2,928	2	376	3,600	2	392	3,631	2	397	4,040	2	282	4,584
do.	3	7·3	Salt	do.	2	270	3,157	2	348	3,280	2	40[illegible]	3,832	2	408	3,872	2	335	3,956
do.	5	6·8	Fresh	do.	2	184	1,290	2	199	1,548	2	—	—	2	176	1,900	2	205	2,725
do.	5	6·8	Salt	do.	2	173	1,190	2	193	1,256	2	196	2,062	2	231	2,125	2	220	1,744
¼ River ...... ¾ Beach	1	9·6	Fresh	do.	2	570	5,644	2	599	6,607	2	517	6,942	2	634	6,700	2	655	6,850
do.	1	9·6	Salt	do.	2	549	6,218	2	563	6.062	2	586	6,841	2	526	6,700	2	445	7,875
do.	2	9·6	Fresh	do.	2	336	3,870	2	373	4,276	2	417	4,595	2	411	5,787	2	380	5,160
do.	2	9·1	Salt	do.	2	305	3,782	2	352	4,075	2	370	3,780	2	400	4,830	2	362	5,912
do.	3	9·1	Fresh	do.	2	216	2,375	2	262	2,697	2	273	3,190	2	309	3,125	2	261	3,607
do.	3	8·8	Salt	do.	2	218	2,453	2	248	2,966	2	269	3,025	2	277	2,875	2	292	3,060
do.	5	9·1	Fresh	do.	2	137	1,124	2	151	1,100	2	188	1,540	2	213	1,916	2	200	2,070
do.	5	8·8	Salt	do.	2	131	989	2	150	1,594	2	177	1,816	2	196	1,964	2	221	1,935

TABLE II.—Showing Results of Tests made from One Sample of Natural Cement to determine the effect of Salt Water used in Gauging and for Immersion.

Sand.		Water.			7 Days.			28 Days.			4 Months.			6 Months.			1 Year.		
Kind.	Ratio to 1 of cement.	Per cent. to Dry Ingredients.	Gauging.	Immersion.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.	No. of Tests.	Tension.	Compression.
Standard......	1	11·1	Fresh	Fresh	1	266	2,586	2	310	3,577	2	385	4 506	2	377	—	2	305	5,505
do.	1	11·1	Salt	do.	2	237	3,106	2	297	3,910	2	400	4,789	2	370	—	2	356	5,460
do.	2	9·3	Fresh	do.	2	147	2,223	2	250	2,685	2	296	3,712	2	298	—	2	235	4,266
do.	2	9·3	Salt	do.	2	134	2,105	2	218	2,558	2	335	3,519	2	332	—	2	207	4,039
do.	3	9·3	Fresh	do.	2	65	1,020	2	107	1,887	2	223	2,572	2	221	—	2	200	3,236
do.	3	9·3	Salt	do.	2	87	—	2	120	1,410	2	230	1,961	2	238	—	2	173	2,056
¼ River ...... ¾ Beach	1	12·0	Fresh	do.	1	198	2,412	2	241	3,261	2	342	3,987	2	327	—	2	328	4,036
do, ...	1	12·0	Salt	do.	2	217	2,555	2	242	3,380	2	409	4,068	2	378	—	2	291	3,405
do.	2	10·9	Fresh	do.	2	101	1,346	2	148	1,800	2	257	3,112	2	222	—	2	210	4,649
do.	2	10·5	Salt	do.	2	143	1,047	2	201	1,658	2	260	2,138	2	263	—	2	175	2,092
do.	3	10·4	Fresh	do.	2	41	—	2	68	1,002	2	174	1,619	2	166	—	2	162	2,675
do.	3	10·4	Salt	do.	2	55	—	2	88	—	2	172	1,535	1	150	—	2	160	1,987
Standard......	1	11·1	Fresh	Salt	2	320	3,212	2	331	3,634	2	369	3,720	2	388	—	2	299	3,525
do.	1	11·1	Salt	do.	2	298	3,042	2	334	3,750	2	414	3,687	2	368	3,212	4	275	3,315
do.	2	9·6	Fresh	do.	2	177	2,240	2	256	2,317	2	322	2,921	2	325	—	2	170	2,939
do.	2	10·4	Salt	do.	2	188	2 532	2	243	2,700	2	325	2,959	2	334	3,112	2	191	2,581
do.	3	9·3	Fresh	do.	2	92	1,084	2	150	1,440	2	228	1,440	2	223	—	2	162	1,940
do.	3	9·3	Salt	do.	2	110	1,218	2	164	1,445	2	232	1,650	2	237	—	2	140	1,804
¼ River ...... ¾ Beach	1	11·8	Fresh	do.	2	274	2,691	2	341	3,052	2	365	2,700	2	376	4,187	2	294	2,701
do.	1	12·0	Salt	do.	2	223	2,687	2	297	3,068	2	397	2,871	2	419	—	2	318	3,270
do.	2	10·4	Fresh	do.	2	121	1,312	2	207	1,880	2	281	2,268	2	301	2,540	2	231	2,617
do.	2	10·5	Salt	do.	2	143	1,047	2	201	1,658	2	260	2,138	2	263	—	2	175	2,093
do.	3	10·1	Fresh	do.	2	88	581	2	125	1,061	2	210	1,460	2	200	1,834	2	187	1,770
do.	3	10·4	Salt	do.	1	40	—	2	149	920	2	227	1,552	2	216	—	2	175	1,819

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* From the *Journal* of the Franklin Institute.

weighing each batch. The briquettes were stored in moist air for twenty-four hours, and then placed in the immersion tanks, where they remained until broken. No attempt was made to keep the tanks at a uniform temperature, but as the briquettes which were to be compared with each other were all made practically at the same time, the comparisons are still accurate without this precaution. The fresh-water tank was renewed as often as the water became noticeably alkaline. The salt-water tank was filled with sea-water and only changed three times, but as the volume of water was fully 100 times the volume of the briquettes stored, it was not thought necessary to renew the water oftener. The briquettes were first broken on a Fairbanks tension machine, and then a heavy rubber band put on them to hold the two parts together, and crushed on a Riehlé machine, worked with hydraulic pressure. Series of tests were made with two brands of cement—one a natural and the other a Portland. In each case all of the cement came out of the same barrel. Sets were made with standard sand, and also with natural sand found in this vicinity. In the case of the natural cement, mortar was mixed in the proportion of 1 to 1, 1 to 2, and 1 to 3; and with the Portland, 1 to 1, 1 to 2, 1 to 3, and 1 to 5. A sufficient number of sets of each were made with fresh water and with salt, and each was immersed in fresh and salt water to complete all of the different series given in the accompanying tables and diagrams. In each series some briquettes were broken at seven days, 28 days, three months, six months, and one year. It was the intention to break some at the end of three years and five years, but this part of the experiments had to be abandoned. In the tables and diagrams, all strains are given in pounds per square inch of section or surface.

RESULTS OF TESTS.

By a reference to Table No. 1 and Diagrams Nos. 1 to 4, it will be seen that in case of the Portland cement the briquettes mixed with salt water were ahead of those mixed with fresh on short-time tests; but that the long-time tests nearly always showed the superior strength of the briquettes mixed with fresh water, and this was just as pronounced in the compression as in the tension tests. It will also be noticed that the deteriorating effect of salt water in gauging is the greatest on the richer mortars. The test pieces that were immersed in salt water nearly always fell below the corresponding ones that were placed in fresh.

In a general way the same thing will be noticed in the case of the natural cement tests, Table No. 2 and Diagrams Nos. 5 to 8. The sample selected, however, seems to have been a poor one, as it shows less strength at one year's time than at six months. The decrease of the salt water briquettes is greater than the fresh, and therefore shows the same results as in the other case. In the compression tests with this sample the results are better.

CONCLUSIONS.

These results would seem to justify the conclusion that salt water is injurious to cement mortar, and that the use of salt or sea-water in gauging mortar is bad practice. The tests are not extended over a sufficient length of time to draw a decided conclusion as to the effect of sea-water on engineering structures built of concrete, gauged with fresh water, but they seem to point to a tendency to weaken them.

EFFECT OF SIZE OF SAND ON CEMENT MORTAR.

In the September number of the *Journal* of the Franklin Institute, 1896, was published an article on the effect of the size of sand, in which it was clearly shown that coarse sand made the strongest mortar. In tables Nos. 3 to 6 will be found another series of tests on the same subject, but in this case the briquettes were all made on a hammer machine after the method just described.

From these tests it will be seen that when perfectly rammed the size of the sand is not so important as with ordinary ramming. It is evident, however, that the size of the sand has some effect even with these briquettes, and the richer the mortar the less the effect of the size of the sand becomes. The large sand also shows to better effect in the compression tests than in the tension.

The superior strength of the rougher sands, like that obtained from breaking up trap rock, is, however, just as apparent with these perfectly rammed briquettes as it was with those made in

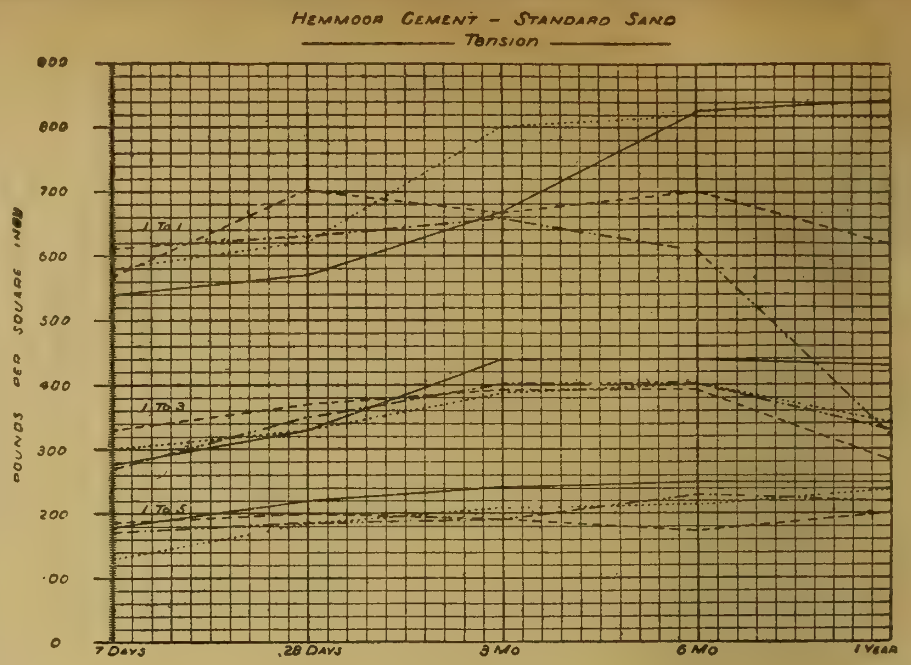

Diagram No. 1.

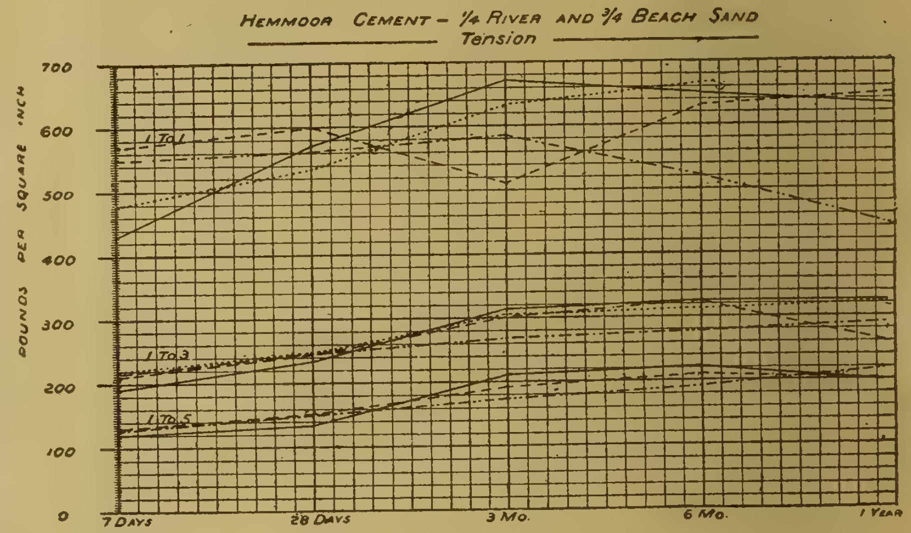

Diagram No. 2.

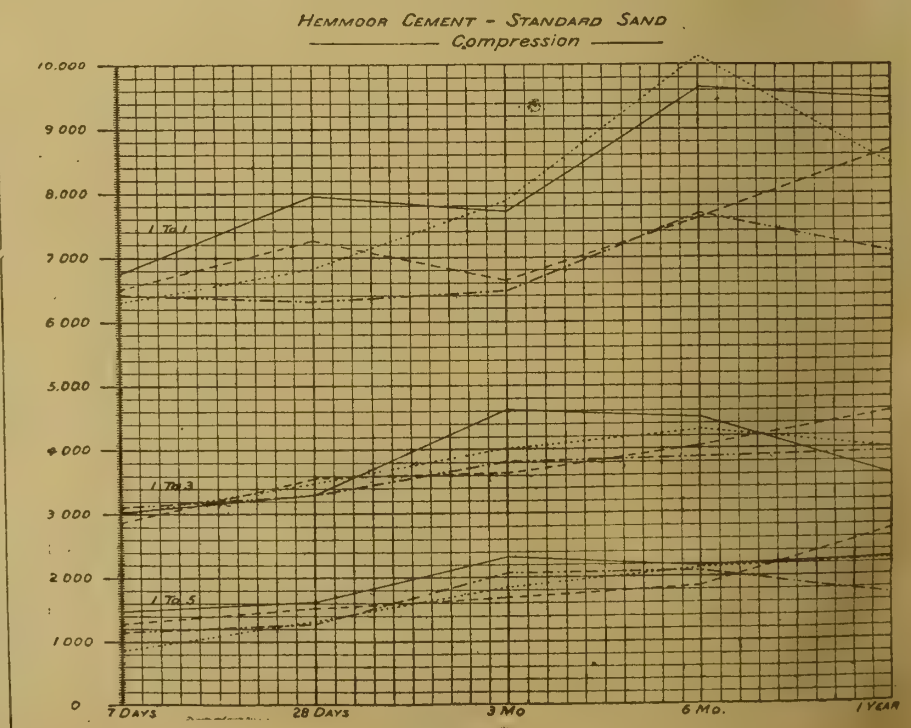

Diagram No. 3.

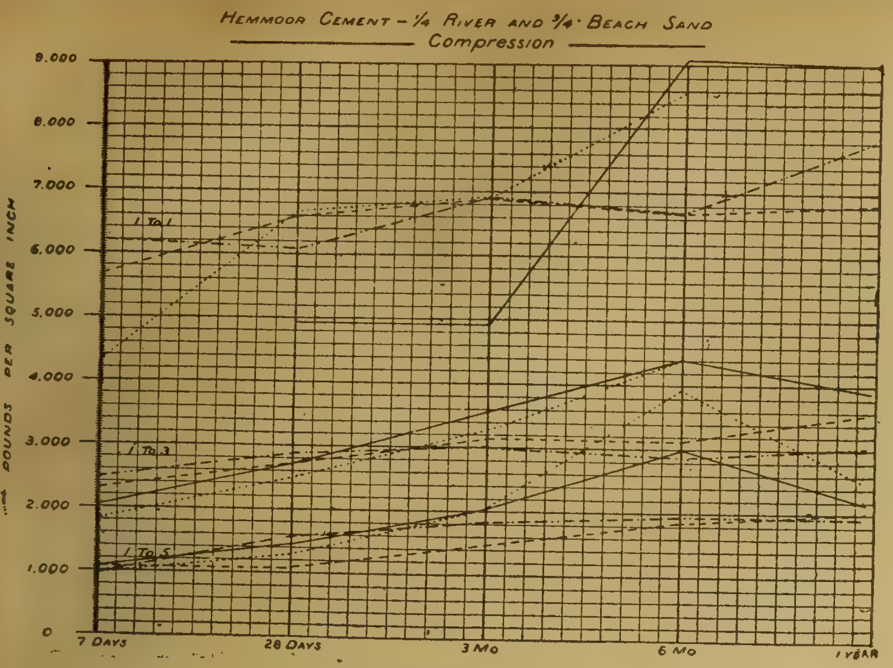

Diagram No. 4.

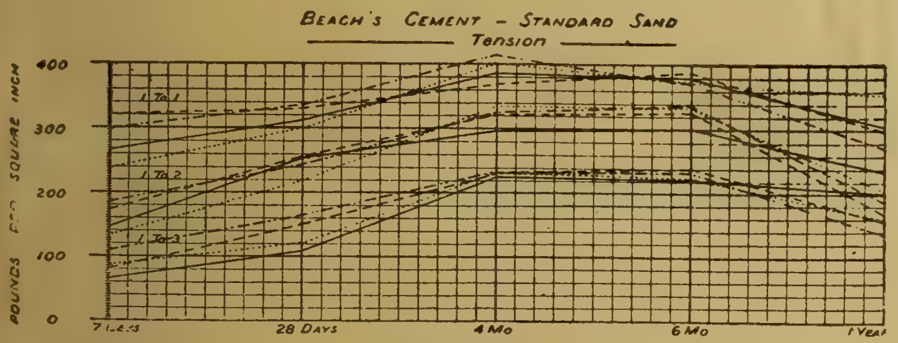

Diagram No. 5.

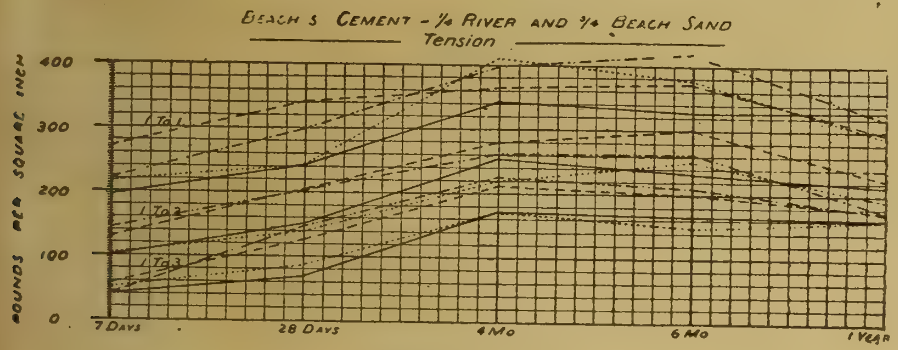

Diagram No. 6.

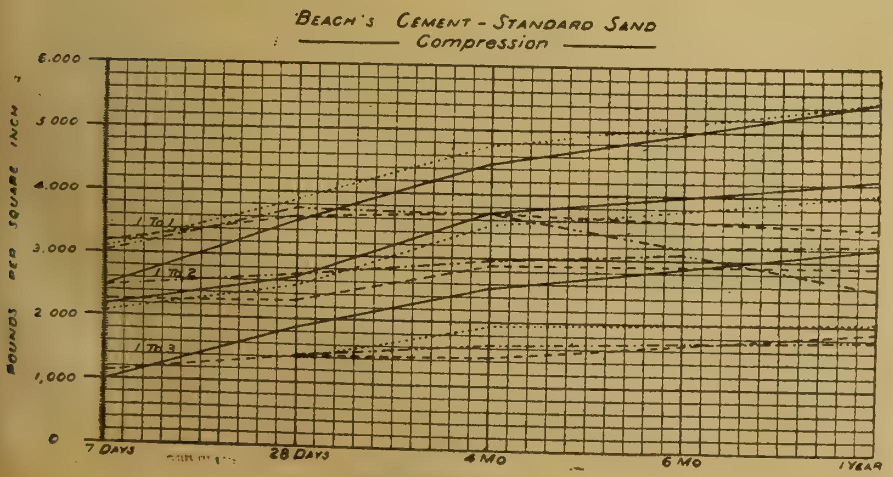

Diagram No. 7.

the ordinary way. It would, therefore, be a safe conclusion that the condition of the surface of any sand is a more important factor in strength of concrete than the size.

Table III.—Briquettes Made of One Sample of Portland Cement and Broken at 11 Months, to Test the Effect of Size of Sand when Perfectly Rammed into Moulds. Granite Sand.

Sand.		Per cent. of water.	Tension.				Compression.			
Size.	Ratio to 1 of cement.		No of Tests.	Highest.	Lowest.	Mean.	No. of Tests.	Highest.	Lowest.	Mean.
6–8	3	7·3	3	418	314	381	3	5,325	4,250	4,675
8–12	3	7·3	4	392	314	359	4	4 225	3,520	3,918
12–16	3	7·3	4	320	280	300	3	3,300	2,800	3,100
16–20	3	7·7	4	412	316	[illegible]	4	3,833	3 312	3,563
20–30	3	7·7	4	428	357	386	3	3,200	2,380	2,833
30–100	3	8·3	4	371	282	340	2	3,080	2,725	2,902
Passed 100	3	8·3	4	315	270	290	3	3,400	3,212	3,333
6–8	1	8·3	4	544	460	493	4	7,600	5,975	7,012
8–12	1	8·3	3	554	482	513	3	7,825	6,500	7,041
12–16	1	8·3	4	610	540	571	4	7.725	6,612	7,194
16–20	1	8·3	4	622	572	597	4	8,075	6,700	7,240
20–30	1	8·8	4	680	584	618	4	7,925	7,425	7,781
30–100	1	9·3	4	675	643	660	3	8,175	7,837	7,903
Passed 100	1	9·9	4	535	498	518	4	6,088	5,825	5,956

TABLE IV.—QUARTZ SAND.

Sand.		Per cent. of Water.	Tension.			
Size.	Ratio to 1 of Cement.		No. of Tests.	Highest.	Lowest.	Mean.
12–16	3	7·3	4	471	351	405
16–20	3	7 3	4	453	375	413
20–30	3	7·8	4	386	333	356
20–30	1	8·8	4	815	745	781

TABLE V.—TRAP ROCK.

Sand.		Per cent. of Water.	Tension.				Compression.			
Size.	Ratio to 1 of Cement.		No. of Tests.	Highest.	Lowest.	Mean.	No. of Tests.	Highest.	Lowest.	Mean.
6–8	3	6·3	4	407	396	402	3	5,025	4,200	4,700
8–12	3	6 3	4	461	261	349	4	4,975	2,750	3,862
12–16	3	6 8	4	455	337	401	4	5,275	3,750	4,494
20–30	3	6 8	4	407	290	369	4	4,425	3,025	3,787
30–100	3	7·3	4	415	323	378	4	4,000	3,175	3,725
Passed 100	3	8·3	4	365	282	321	4	4,550	3,575	4,081
8–12	1	7 3	4	692	555	600	4	8.325	6,250	7,106
12–16	1	7·3	4	730	565	621	4	8,825	7,675	8,381
16–20	1	7 8	4	775	650	714	4	9,500	8,050	8,962
20–30	1	8·0	2	671	632	651	2	10,025	9,775	9,800
30–100	1	8 9	4	820	630	723	4	9,725	7,325	8,675
Passed 100	1	13·0	4	837	640	747	4	8,450	7,800	8,162

TABLE VI.—RIVER SAND.

Sand.		Per cent. of Water.	Tension.				Compression.			
Size.	Ratio to 1 of Cement.		No. of Tests.	Highest.	Lowest.	Mean.	No. of Tests.	Highest.	Lowest.	Mean.
6–8	3	6·3	4	393	257	318	4	5,750	4.050	4,718
8–12	3	6 3	4	372	300	331	4	5,975	5,075	5,531
12–16	3	6·3	4	327	234	282	4	5,025	4,350	4,712
16–20	3	6·7	4	385	239	314	3	4 400	3,675	4,125
20–30	3	7·3	4	373	279	313	4	5 500	4,550	4,772
6–8	1	7·3	4	446	350	347	4	6,800	5,750	6,387
8–12	1	8 3	4	494	437	476	4	8 100	6,950	7,562
12–16	1	8·3	4	592	577	587	4	8,750	6,875	8,106
16–20	1	8·3	4	705	564	615	4	8,800	8,325	8,460
20–30	1	8·3	4	660	625	635	4	9,137	7,975	8,846

TIME OF SET.

As it is the prevailing opinion with many engineers that a cement mortar which has stood an hour or two has lost some of its strength, it is thought worth while to give here a set of tests made to determine the amount of lost strength of Portland cement mortar due to its standing after mixing and before using. Four large batches of mortar were mixed, and briquettes made by hand from each pile at intervals, ranging up to eight and one-half hours after mixing. These were all carefully marked and stored away as usual, and broken after one year. The results are in Table No. 7, from which it will be seen

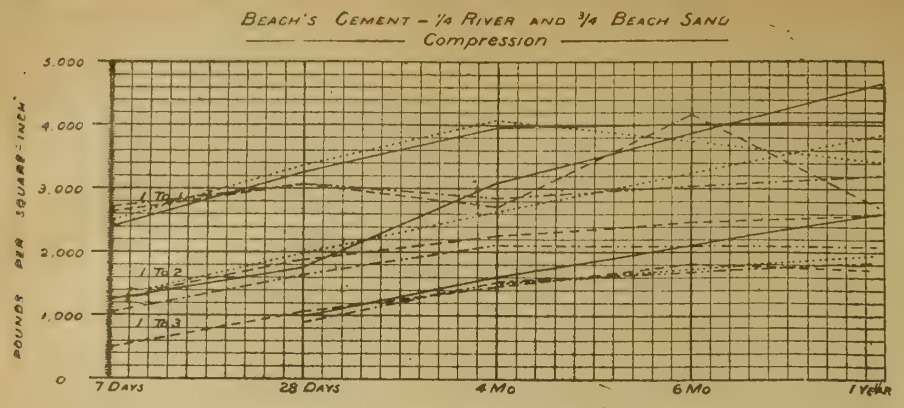

Diagram No. 8.

References to Diagrams.

———— Indicates briquettes mixed with fresh water and immersed in fresh water.
— — — — — do. do. do. fresh do. do. salt do.
— — - - — — do. do. do. salt do. do. salt do.
- - - - - - - - do. do. do. salt do. do. fresh do.

Table VII.—Test of Briquettes made of one sample of Portland Cement, proportion 1 : 3, and broken after One Year's time, to determine the effect of letting mortar stand after mixing.

Kind of Sand.	Per cent. of water.	Made when mixed.		Made 1 hour after mixing.		Made 2 hours after mixing.		Made 3 hours after mixing.		Made 4 hours after mixing.		Made 5 hours after mixing.		Made 6 hours after mixing.		Made 7 hours after mixing.		Made 8½ hours after mixing.	
		Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.	Tension.	Compression.
Beach	14·0	232	2,350	248	2,400	227	2,487	211	2,440	—	—	—	—	—	—	—	—	—	—
,,	9 7	182	2,056	181	1,700	172	1,553	176	1,650	—	—	—	—	—	—	—	—	—	—
,,	15·3	240	2,400	230	2,185	245	2,523	227	2,270	—	—	229	2,306	—	—	226	2,281	236	2,260
River	13·9	244	2,775	233	2,794	194	3,031	—	—	240	2,987	—	—	259	2,715	235	2,756	—	—

that the loss of strength after eight and one-half hours' standing is practically nothing.

In practical working with most Portland cement, if it becomes necessary for the mortar to stand for one-half of a day even, no injury will result, provided the precaution is taken to keep the mortar wet.

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FIRE TESTS WITH DOORS.

A SERIES of very interesting investigations have been made by the British Fire Prevention Committee upon doors of deal, teak, and oak which deserve notice. We have already mentioned the results of several of these useful tests with ordinary building materials—lath-and-plaster and metal-lathed partitions, glass, &c.; the present fire tests with doors of deal, oak, and teak are illustrated by a series of instantaneous photographic views, which exhibit the doors before and during the progress of the tests. We first take fire-test G, made in May last—a solid framed door of 2in. teak. The object of the committee was to record the effect of a fire of one hour gradually increasing to a temperature of 2,000° Fahr. The size of door was 6ft. by 2ft. 5in., hung to a 4in. by 3in. rebated teak frame to open outward. After 24 minutes, flame showed between bottom edge of door and sill; after 49 minutes, flame showed between edge of frame and stile of door above and below the lower bolts; after 54 minutes smoke issued through the joints of panels and centre rail; and after 60 minutes flame burst through all joints, and the door collapsed five minutes after. The tests H and I were made on four-panelled pine doors. They were old doors, and hung in 4in. by 3in. rebated frames, as before. One was 1⅜in. thick, 6ft. 6in. by 2ft. 7in. and the other was 1⅞in., and was 6ft. 6in. by 2ft. 7in. The temperature was increased gradually to 1,500° Fahr. The effect on the 1⅜in. door was that fire broke out through it in 19 minutes at a temperature of 1,400°, and it was destroyed in 22 minutes; the 1⅞in. door resisted the door for another three minutes, when it broke through at a temperature of 1,600°, and the door collapsed in 26 minutes. Full particulars are given describing the testing-plant, testing-chamber, the testing observations. The sub-committee comprised many professional and scientific experts. Mr. Edwin O. Sachs is chairman of the Executive, and Mr. F. R. Farrow, F.R.I.B.A., directing member. The results of these tests show the rapid destruction of four-panel deal doors, such as are generally put in houses, and 20 minutes' duration of resistance to flames is about the limit; thickness does not count for very much in a panelled door. The 2in. solid teak, close-fitting doors, described resisted flames for an hour. These experiments are valuable as showing the comparative fire resistance of doors of different materials.

Another report describes fire tests on a 2in. framed oak door with 2in. solid panels, and a 2in. framed teak door with 2in. panels. The effect of fire increasing to a temperature of 2,000° Fahr. on the door, which opened inwards, was that in the case of the oak door in 30 minutes the flame appeared between frame and top rail of door, and in 40 minutes the flame appeared between upper panel and stile. In 44 minutes flame came through lock rail, in 55 minutes the four panels fell outwards, and in 59 minutes the remainder of door collapsed. The teak showed flame between frame and top rail in five minutes, and gradually extended along top edge and down top rail and panel; in 55 minutes the fire extended to bottom of top panels, and flame came through joints between muntin and lower panels. In 58 minutes the door collapsed and fell inwards.

These tests are valuable, as showing the fire-resisting qualities and duration of solid-framed bead butt doors, the panels being the full thickness of door. They also prove the greater resistance of solid panels of oak and teak. The oak door was of American oak, and the teak door of Moulmein teak, in frames 4in. by 3in., ½in. rebate secured to brickwork by deal plugs. Full details are given of the plant and observations during the tests. The instantaneous views taken every few minutes during the tests increase the value and interest of these reports, and we learn that to Mr. Ellis Marsland, who conducted the test for the sub-committee, the committee are indebted for these photographic details. The particulars are given in this report in parallel columns, thus facilitating comparison between the two tests.

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MUNICIPAL HOUSING IN LONDON.

A RETURN has just been issued by the Housing of the Working Classes Committee of the London County Council, showing the financial result up to March 31st of this year of all workmen's dwellings or lodging-houses erected or owned by the Council. The return is divided into two parts. In the first notice, the committee deal with the dwellings upon sites upon which the Council elected to build. Eight schemes carried out under the Housing of the Working Classes Act are included in the table. Upon these schemes the total capital expenditure has been £367,899, and up to March 31st last, after full provision has been made for interest, sinking fund, and repairs, they exhibit a net surplus of £921. This is after deducting a certain sum raised by rate to meet deficiencies in connection with some of the buildings. The last year's working has by no means been successful, as on the eight schemes there has been a net deficiency of £385, which largely reduces the surplus of previous years. The Parker-street lodging-house has again been profitably carried on, whilst there are small surpluses in the cases of the Brooke's-market (Holborn) scheme, the Dufferin-street costermonger dwellings, and the Green-street and Gun-street (Southwark) dwellings. Deficiencies appear in the accounts of the Boundary-street area and the Cable-street (Shadwell), Shelton-street (St. Giles), and Goldsmiths'-row (Shoreditch) schemes. The second part of the return deals with five housing schemes carried out under the Housing Act and the Blackwall Tunnel Acts, upon sites upon which the Council had no option but to build, as no purchasers could be found for the land. Each of these schemes shows a considerable deficiency, the net aggregate deficiency up to the end of March last amounting to £6,972. Towards meeting this £1,751 has been raised by rate. The largest loss—£2,886—is shown by the Hughes-fields (Deptford) scheme, while there is a deficiency of £2,266 on the Westview-cottages (East Greenwich), and of £1,025 on the Council-buildings (Poplar).

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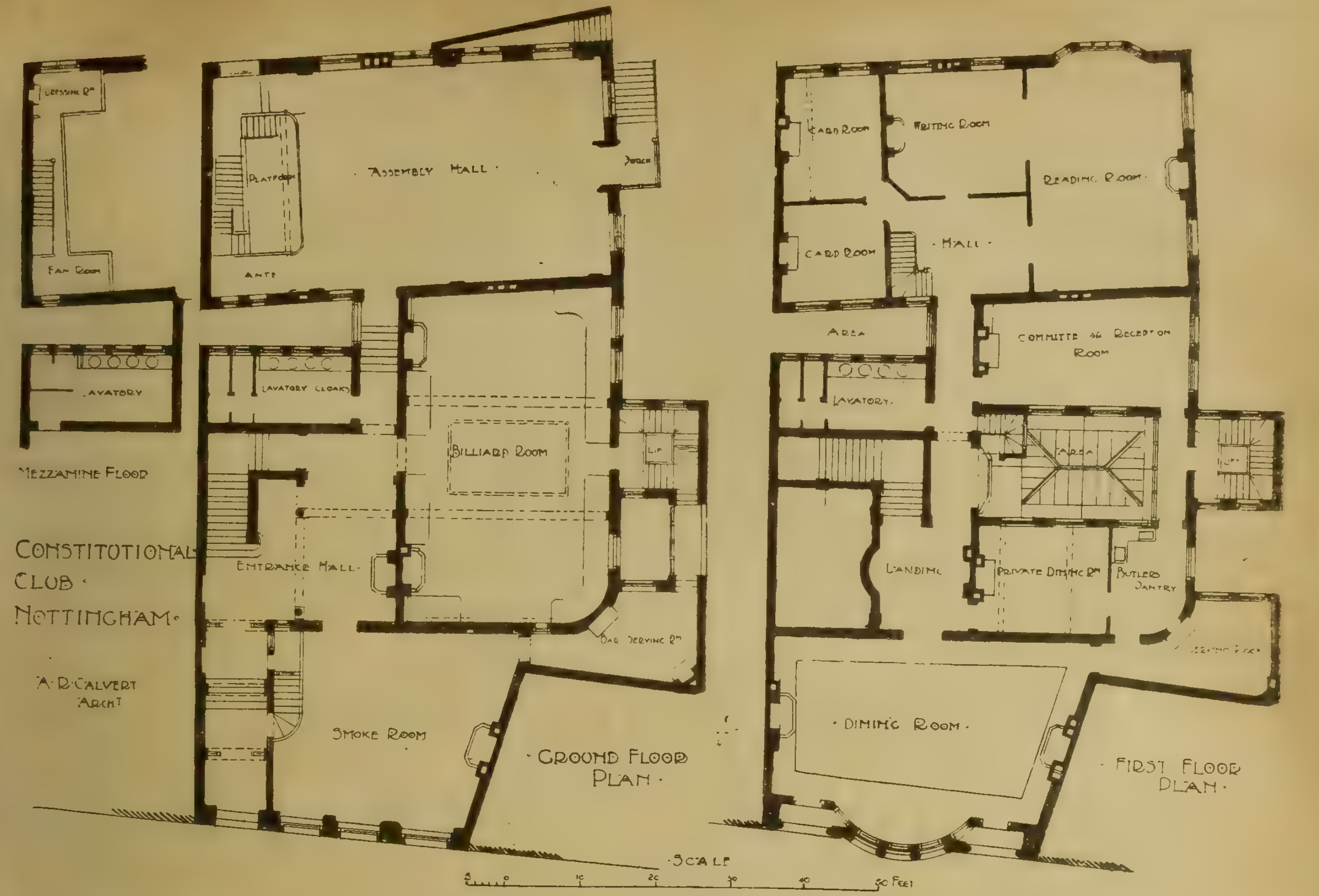
SIR WYKE BAYLISS ON ART AND RELIGION.

THE president of the Ruskin Society of Birmingham (Sir Wyke Bayliss) delivered his presidential address on Thursday night in last week, at the Birmingham and Midland Institute, his subject being "Art, an Essential Element of the National Life." Mr. E. R. Taylor presided, and there was a large attendance. Sir Wyke Bayliss laid before the meeting the proposition that religion and art were two forces, spiritual and æsthetic, moving in the same plane of human life and action to the same end, the subduing of evil, against the common enemy, the world, the flesh, and the devil. But they moved under different sanctions. In its fight against the world Art did not look to the promise of another, but to the purifying of this; in its struggle with the flesh. Art strengthened us not by deadening our senses, nor by lifting us above them, but by quickening them to a truer perception; in its conflict with evil or the devil Art animated us with visions of beauty, of which it or he was the destroyer. If that were true, it would be seen that religion could have no formula to determine what was true in Art, any more than Art could have a formula to determine what was true in religion. Did the curate quite know, in arranging the services, how far he was acting as a priest, and how far as an artist; and did the painter in his studio, dreaming of Art as the regenerator of the world, quite realise that Art had never yet accomplished anything great except under religious inspiration of some kind? In alliance with religion Art found enough to do, for religion was the recognition of a relationship existing between us and God, by which we owed to Him the performance of certain duties, and submission to His will. Did we not submit to that will, and perform those duties in a most artistic manner? We were not quite sure whether the sense of reverence which came upon us when we entered a great cathedral was reverence towards the Lord of the Temple, or the Temple itself, or the architect who built it; but, at all events, we were satisfied that the architect must have possessed fine religious feelings. Art could become religious, and still be Art, but religion could not be æsthetic, or it ceased to be religion. Religion was the placing of everything in the hand of God, and a surrendering of our will to His, while Art was the taking of everything into our own hands and controlling it according to our own will. That was the difference. Art was an essential element in national life because it stood in close relationship to the great struggle which was always going on between good and evil. In that struggle Art was always taking sides. It took sides with the Greeks against the corruption of sensualism,



with the North men against the brutal law of force, with the Mediævalists against the cruel Inquisition, and it took sides with us now against the still greater corruption and brutality and cruelty of modern commercialism. It came to our aid to-day in our conflict with the world, the flesh, and the devil with forces greater than of old, and, if not greater, at least more subtle and more adapted to our needs. Art was eyes to the blind, strength to those who were weak, gentleness to those who were strong, manhood to the youth, restitution to those who suffered wrong, greeting to those who were absent, faith to those who were doubting, hope to the desponding, charity to all. That was what Art was to us, because it was the greater and we were the less. It was one of the environments of our lives that was daily shaping them to fair or foul issues.

THE NOTTINGHAM AND COUNTY CONSTITUTIONAL CLUB.

THIS building has been erected in one of the principal thoroughfares of the city, and is considered as one of the most complete and well-equipped clubs out of London. The accommodation is smoking-room, billiard-room (three tables), and assembly hall on the ground floor; dining-rooms, committee-room, reading, writing, and card-rooms on first floor; members' bedrooms, bathroom, and steward's rooms on second floor; also kitchen, scullery, and servants' hall disconnected entirely from the members' room; and above are the maid- and men-servants' bedrooms. A large skittle-alley is also provided in the basement, as also the retiring rooms to assembly hall. A ladies' room for country members has been provided, but is kept separate from the club proper. This is a most comfortable room, decorated in peacock blues and white. A special feature is the large entrance hall and grand staircase of Mansfield stone, the fireplace being a canopied dog-grate, with a massive mahogany chimney-piece, all specially designed. The most extensive frontage is to Rigley's-yard; but the main front is to Market-street, and is carried out in Derbyshire stone, with one large massive gable carried to a height of about 72ft. The large circular oriel window, with balconies on each side to first floor, commands an excellent view from the large dining-room. The front entrance porch is panelled Kilkenny and Languedoc marbles, which, together with the mahogany screen glazed in antique glass, gives a very rich effect to the entrance. The contractor for the foundations was Mr. W. Woodsend, who has also put in the fixtures, Mr. J. Hutchinson being contractor for the upper portion. The architect is Mr. A. R. Calvert, F.S.I., Nottingham, assisted by Mr. W. R. Gleave, A.R.I.B.A., who has acted as clerk of works throughout.

CHIPS.

The next exhibition of the Society of Portrait Painters will be held at the Grafton Galleries during January and February, 1900, instead of this autumn at the ordinary date.

Colonel A. J. Hepper, R.E., an inspector of the Local Government Board, visited Mexborough recently in regard to an application by the district council for powers to borrow £1,428 for the purchase of land for plant for electric lighting, for market extension, and for a depot for highway purposes.

It is stated that the construction of the Sultanpur-Allahabad Railway, 100 miles in length, has been sanctioned by the Indian Government.

Considerable alterations are in progress in the interior of Stapenhill Church. The chancel floor is being raised and extended, and the reredos taken down and erected on a higher level. A new font is also to be provided, whilst the pulpit will be placed in a different position. Formerly it stood close to the chancel steps, but it has now been decided to place it in front of the main pier on the north transept. The bulk of the work is being carried out by Messrs. Lowe and Sons, and the plans have been prepared by Mr. T. Jenkins, architect, of Burton-on-Trent.

A chimney-shaft of novel construction—the first of its kind built in England—is about to be provided at the new power-house for the electric system of the London United Tramways Company at Chiswick. The new chimney, which is of American origin, is built mainly of steel, and lined with fire-bricks. The plans have been approved by the urban district council.

The Light Railway Commissioners are to hold a public inquiry at the Institute, East-street, Faversham, on Thursday next, Nov. 2, as to the expediency of granting the application for the construction of the proposed light railway from Faversham to Maidstone.

OBITUARY.

Mr. William Baker Pearce, architect and surveyor, of Portsmouth, died very suddenly at his residence in Auckland-road East, Southsea, on Saturday last, aged 52 years. Mr. Pearce was the eldest son of Mr. William Pearce, solicitor, of Portsea.

At the Torquay Cemetery on Saturday, the funeral took place of Mr. Sydney S. Morrish, for many years of Clare House, St. Marychurch, and recently of Bloomfield, Meadfoot-road. Deceased was an artist of considerable ability, and as a painter of landscape and seascape he had abundant material in the neighbourhood of Torquay. He was a frequent exhibitor at the Royal Academy of scenes of Torquay, Dartmoor, and other parts of Devon, and the Corporation of Brighton and the Legislative Council of Tasmania are amongst the bodies that have purchased some of his more noteworthy pictures. As a portrait painter Mr. Morrish was also successful. In the Torquay Town-hall are three portraits presented by public subscription, and others are hung at the Vivian Institute and the Town-hall at Dartmouth. For years a sufferer from a chest complaint, the climate of Torquay had greatly prolonged his life.

The death took place on Thursday in last week of Mr. John Priestman, of Blackwellgate, Darlington, at the ripe age of 88. The deceased and his family have carried on business as monumental sculptors in Blackwellgate. His "Temple of Vespasian" received the commendation over 40 years since of Monti, the famous sculptor. The great changes which have occurred during the long life of Mr. Priestman are brought to mind by the moulded frame formed of gypsum, inclosing a picture of Durham Cathedral, executed by him. The gypsum used for this and other purposes was brought from Carlisle by road by Mr. Priestman 70 years ago.

St. Barnabas' Church, a corrugated iron structure in King Edward-street, Grimsby, is shortly to be replaced by a permanent brick building. The old structure, which has answered its purpose for 25 years, was sold last week by public auction to Mr. Hewins, a local builder, for £52 10s. The internal fittings, including the pulpit, were also disposed of. Sixteen hundred pounds has been obtained towards the cost of the new building.

Building Intelligence.

Ancoats, Manchester.—The Lord Mayor of Manchester opened on Monday a new lodging-house erected in Harrison-street, Ancoats, by the corporation at a cost of £26,000, for the use of men. Before the ceremony the members of the Sanitary Committee visited the blocks of dwellings in the neighbourhood built by the corporation for working people. These are situated in Oldham-road, Pollard-street, Chester-street, and Pott-street, house 2,660 persons, and seemed fully occupied. The new lodging-house is built on a site containing a superficial area of 3,375 yards, and stands three stories high, with a frontage of 178ft. and a depth of 118½ft. There are the usual baths, washhouse, and other conveniences in the basement, and the administrative block is in the front of the building, entirely separated from the lodgers' department. Accommodation is provided for 363 men.

Barton-on-Humber, North Lincolnshire.—The unusually fine weather has, says a correspondent, prolonged operations beyond the usual time. In ordinary seasons the manufacture of hand-made bricks is usually at an end by Hull Fair, but the open weather has induced manufacturers to continue work. No doubt this is largely due to the demand and the rise in prices. With machine-made bricks, which are dried under shelter, the manufacture may continue as long as the weather remains mild, in either case a frost at once brings operations to a close, although there are rare cases where bricks are made throughout the winter and dried in steam flues. A walk along the Humber bank reveals the fact that stocks are low, and should the weather continue favourable for building purposes, they will be exhausted before next season. Most of the prepared clay has been used, and there will be ample employment for the workmen during the winter in digging and tempering clay ready for use in the coming spring.

Bristol.—With the reconstitution of Bristol as a separate see, there was a natural desire that the new Bishop of Bristol should be furnished with an episcopal residence, the ancient palace having been destroyed by fire in the Bristol Riots of 1831. A house in Berkeley-square was presented to the see by Mr. Daniel, but Bishop Browne preferred a residence in the environs of the city, and Mr. Greville Edwards presented an excellent site upon his estate at Redland Green for the purpose of erecting an entirely new building. The designs were made by Mr. W. D. Caröe, of Whitehall, S.W., a member of the firm of architects to the Ecclesiastical Commissioners, and the contract has been let to Messrs. Stephens and Bastow, a well-known Bristol firm. The new house will be erected in close proximity to Redland Green Chapel. The walls will be generally finished with rough-cast, with a rough stone basement, and tile-hanging in the gables. The chimneys are furnished with circular stone shafts, similar to many in the Lake country.

Hadley, Salop.—Rapid progress is being made with the extensive buildings at Hadley, near Wellington, Shropshire, for Messrs. G. F. Milnes and Co., of Birkenhead, for manufacturing electric tramcars and light-railway cars. Some years ago the Nettlefold Company, employing from 600 to 700 men, occupied the Castle Ironworks, and when they moved the works to South Wales the district was practically depopulated. Now houses are being erected for the accommodation of 550 workmen who will be employed at the new electric-car works, which will cost over £100,000. The company will be able to turn out 700 or 800 cars per annum. Already sufficient orders have been booked to keep the men employed for over two years. On Saturday a rearing dinner was given to the men employed on the buildings, in the Wellington Town Hall, by Messrs. Hughes and Stirling, the builders, and about 280 were present.

Hove, Brighton.—A first-class residential hotel, with combined self-contained flats in connection therewith, is to be erected on the site now occupied by the property known as Mill's Terrace, King's-road, Hove. The King's-road frontage will be occupied by ten shops with flats over, and the parallel side will have a frontage of 277ft. of uninterrupted sea view, along which the corporation are now extending the Marina, to which the Local Government Board recently gave their sanction. Messrs. Palgrave and Co., of Victoria-street, Westminster, S.W., are retained as the architects for the work, and are instructed to push on the building with all speed.

Ipswich.—The Victoria Diamond Jubilee Wing of the Ipswich and East Suffolk Hospital on the Anglesea-road was formally opened on Wednesday week. It is situated at the east end of the south front of the hospital, and balances the new children's wing at the west end. There are two wards for men, one on the ground and one on the first floor, and in the basement there are a men's day-room, a servants' hall, and other rooms. The servants' hall is distinct, and communicates with the kitchen by a subway under the present men's ward. The new wards will each accommodate 12 beds. There is an external approach to the new wing on the west side by a broad flight of stone steps. The doorway is architecturally treated with circular stone columns with Ionic capitals, entablature, and broken pediment above, with a medallion of the Queen in the tympanum. In other respects the external treatment of the new building harmonises with the present old structure. The floors of the new wards are on a level with the present wards, with wide communication corridors capable of being shut off by sliding glass doors. The bathrooms are fitted up with porcelain baths and terrazzo floors, the washing places also having terrazzo floors and glazed whiteware sinks. The staircases are of stone, with wrought-iron balustrades and mahogany handrails, and painted walls. The wards are heated by central open fireplaces, the floors are of polished teak, and the walls plastered, painted, and varnished. The work has been executed from designs by and under the supervision of Mr. E. F. Bisshopp, architect and diocesan surveyor, the builder being Mr. S. A. Kenney, both of Ipswich.

Salford.—Spinning and weaving departments have been established at the Royal Technical Institute, Peel Park, Salford, and their formal opening took place on Friday. The departments complete the scheme of the promoters of the Institute. The two rooms, one for spinning and one for weaving machinery, are each 80ft. by 50ft. The spinning-room is on the ground floor and the weaving shed, which has a series of roof north lights, on the first floor. There is a separate steam-engine in each room, the power being supplied from the original Galloway boilers. The heating and ventilating are arranged for by an extension of the general system of the Institution on the Smead-Blackman principle. The machinery in the spinning-room is the gift of Messrs. Dobson and Barlow, and represents a value of about £1,500. Messrs. Butterworth and Dickinson, of Burnley, have given a good portion of the weaving machinery, valued at several hundred pounds.

Seaforth.—The memorial stone of the new Congregational church was laid on Saturday last. The building is being erected on the land adjoining the present school-chapel, and has frontages to Elm-road and Gladstone-road. The plan shows a nave 70ft. 6in. long by 38ft. 3in. wide, with arched arcades on either side, ambulatory aisles, and transepts. There will be a gallery at the end. The sitting accommodation will be 566, including the choir, which is arranged in stalls on a raised daïs in front of the pulpit. The organ chamber is in an arched recess at the back of the pulpit, with the trackers brought underneath. The exterior treatment is in brick, with Whiston stone dressings. The style is Gothic, treated freely. The end, clerestory, and transept windows have traceried heads, and all will be filled with leaded glazing. The interior will have the surface of the walls finished in plaster, and the joiner's work in pews, pulpit, choir-stalls, gallery-front, &c., will be of American canary-white wood, stained green, and varnished. The roof will be in pitch-pine, with shaped and trussed principals, and will be open to the ridge, and sheathed on the underside of the spars with boarding. The flooring will be of pitch-pine boards, laid solid on sleepers bedded in a concrete floor, and the porches will be tiled. The ventilation will be combined with the heating arrangements, with air inlets connected with hot-water radiators. The contractor is Mr. Jas. Holme, Hicks-road, Seaforth, and the sub-contractors under him are Messrs. Hough and Pilling for joinery and Mr. James Green for the masonry. The whole is being carried out from the designs, and under the superintendence of, Mr. J. H. Cook, St. George's-crescent, Liverpool. The cost of the scheme, organ included, will be £5,000.

Tooting, S.W.—At the last meeting of the Metropolitan Asylums Board, a report was brought by the Works Committee recommending the acceptance of the tender of Messrs. W. Johnson and Co., Ltd., of Wandsworth Common, for the erection of the Tooting Bec Asylum, at the sum of £204,548, in accordance with the plans and specifications prepared by Messrs. A. and C. Harston, architects. The architects' revised estimate for the work was £210,000. Mr. J. T. Helby moved as an amendment that the recommendation be referred back to the committee, with instructions to examine the specification with a view to reducing the cost, which he thought excessive. The proposed institution was to contain 720 beds, and the total cost, exclusive of furniture, worked out at about £366 per bed. Mr. Percy Wells seconded the amendment. Mr. A. C. Scovell deprecated the idea of referring the recommendation back, and so delaying the work. The specifications had been already carefully examined and criticised. The amendment was eventually defeated, and the recommendation of the committee agreed to. A detailed estimate of the expenditure on the erection and fitting up of the asylum, amounting to £247,690 (exclusive of the cost of the land and the furnishing of the institution) was also approved, and it was resolved to request the Local Government Board to issue an order authorising that expenditure and the raising of the amount on loan.

CHIPS.

The police commissioners of Govan have remitted to a committee to consider and report as to the steps necessary to put in operation the provisions of the Housing of the Working Classes Act.

At the last meeting of the Bristol Town Council the chief matter of interest was the proposal to extend the dock accommodation by enlarging the outer docks at Portishead. The idea is to enlarge the lock at Portishead to 750ft. by 80ft., at a cost of £350,000, with an additional £25,000 to give swinging room for the largest steamer within the dock. The scheme was carried by a large majority.

The foundation-stone of the new Church of Emmanuel, New Brighton, Birkenhead, will be laid by her Grace the Duchess of Westminster to-morrow (Saturday).

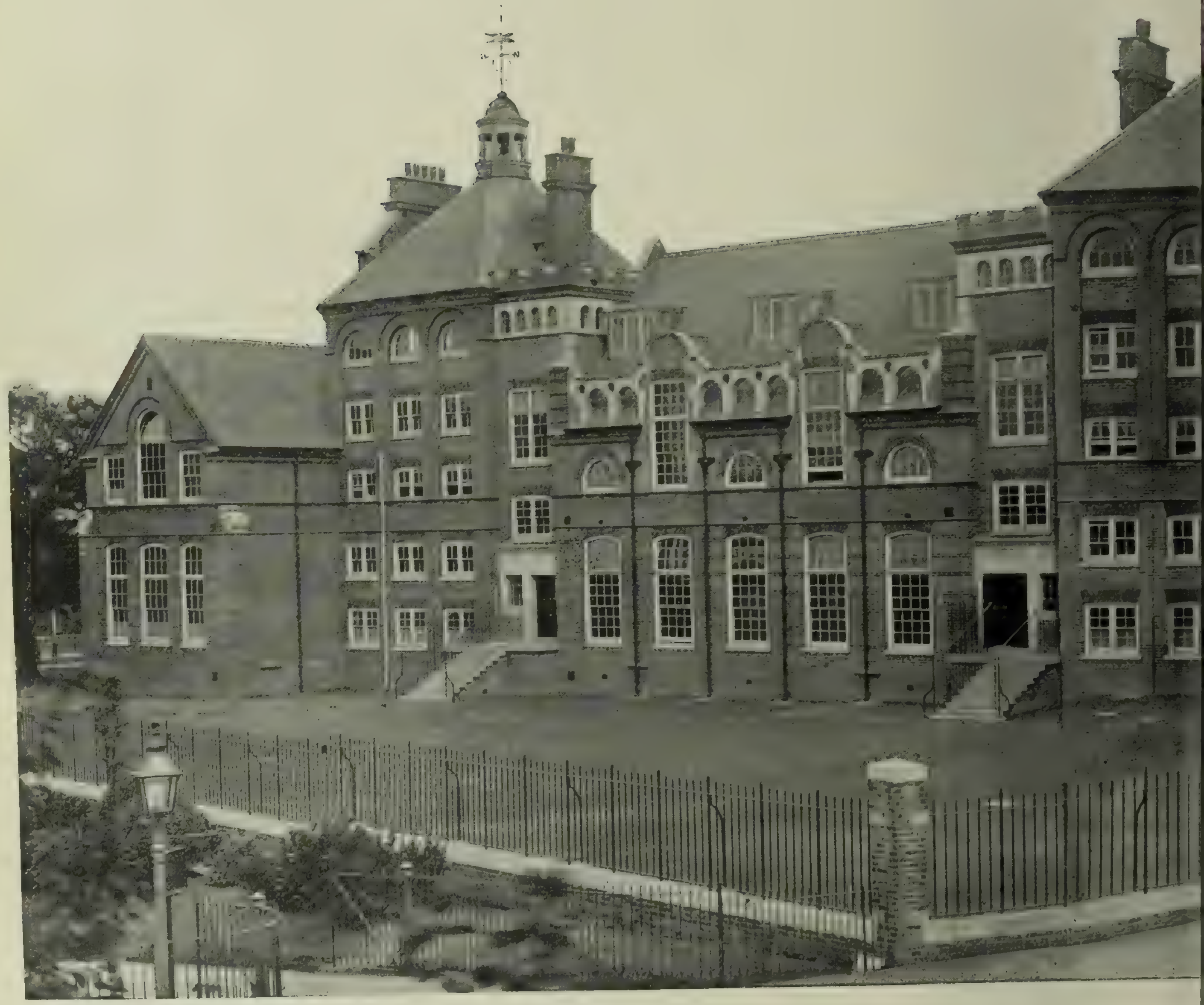
At Brookland church, near Bristol, a memorial bust of the late Mr. William Gibbons was unveiled on Monday. It has been executed by Mr. J. Adams Acton, of London.

Some interesting details with reference to the new headquarters of the Baltic were given at the annual meeting of the members on Thursday in last week at Winchester House. The Chairman (Mr. Septimus Glover) stated at the outset that they would have to move out of South Sea House on September 30 next year. He then went on to allude to the scheme for providing a new exchange in Jeffrey's-square, St. Mary Axe. The responsibility for the enterprise had now been undertaken by a syndicate, who were prepared to erect a building for the accommodation of the members. The syndicate proposed to promote a company with a capital of £400,000, and they estimated that their profit—£15,000—and all the costs would amount to £324,000, or at the outside £350,000. The accommodation would be an area of 16,000 superficial feet, against 5,195ft. in South Sea House, leaving ample room for dining, smoking, &c.

The will of Mr. Henry Simon, of Lawnhurst, Didsbury, and of Manchester, engineer, has been proved. He left personal estate of the net value of £146,794 15s. 2d., the gross value being entered at £176,306 2s. 11d.

The West Middlesex Water Company have sent a letter to the Richmond T.C. announcing their intention to construct a tunnel 14ft. in diameter beneath the Thames at Richmond, to convey their new main, and to construct an entrance thereto from the public recreation ground in the Old Deer Park, near to the river. They have also offered to construct a rustic bridge across the stream known as the Ha-ha, which separates the park from the river bank. It has been agreed to accept the company's proposal.

A new Roman Catholic school for girls and infants at Partick was blessed by the Archbishop and opened on Wednesday, the 11th inst. The main frontage extends to 156ft. The school is two stories in height, with basement containing a hall and stillroom. The ground-floor has central hall and staircase; and there are entrance halls and staircases to north and south, giving separate entrances to all the classrooms above and below. On each floor there are six classrooms, giving accommodation to a total of 864. The schools are provided with teachers' rooms, cloakrooms, and lavatories. The total estimates, without the desks, were £6,800. Mr. Joseph Cowan was the architect.



HIGHER GRADE S

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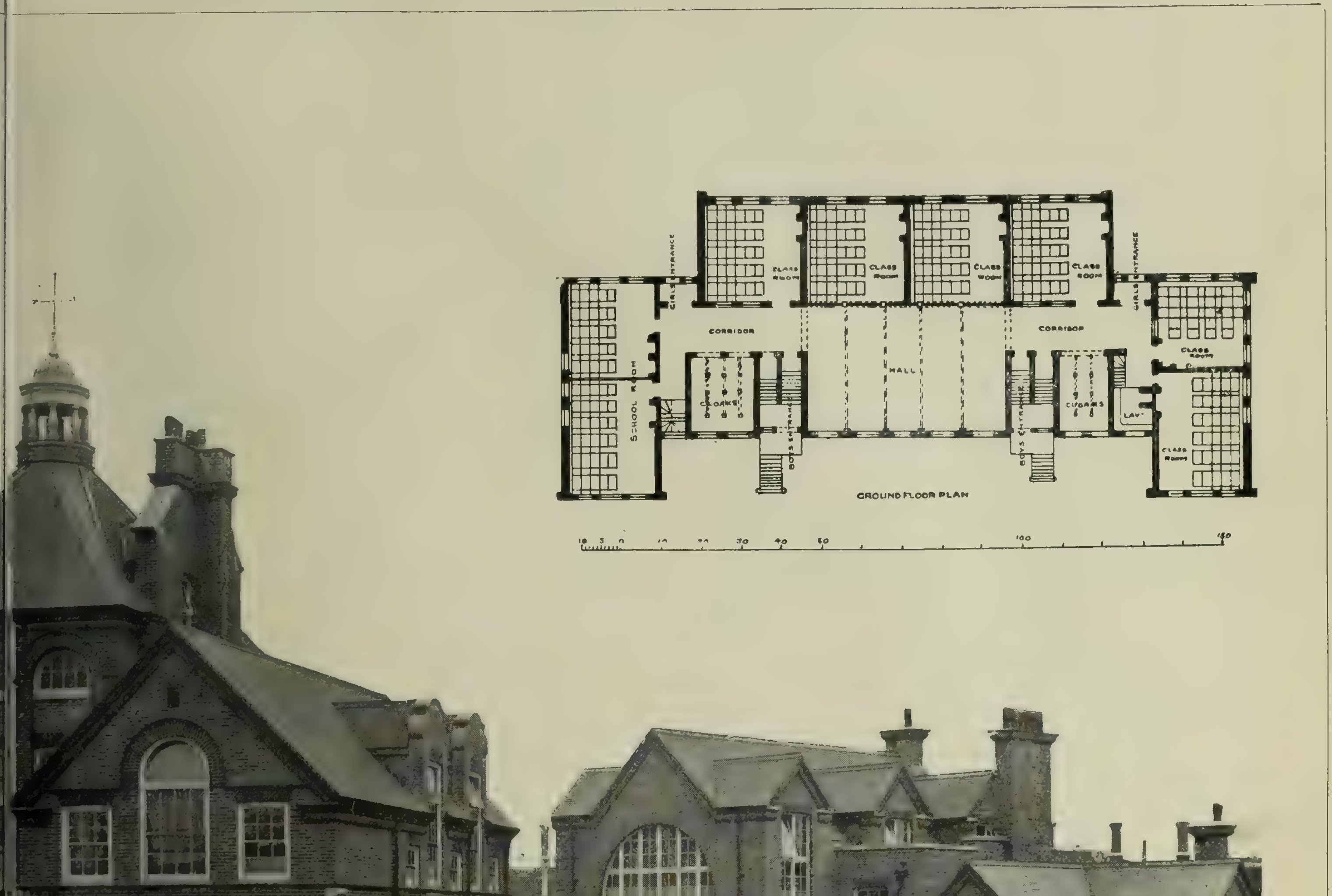
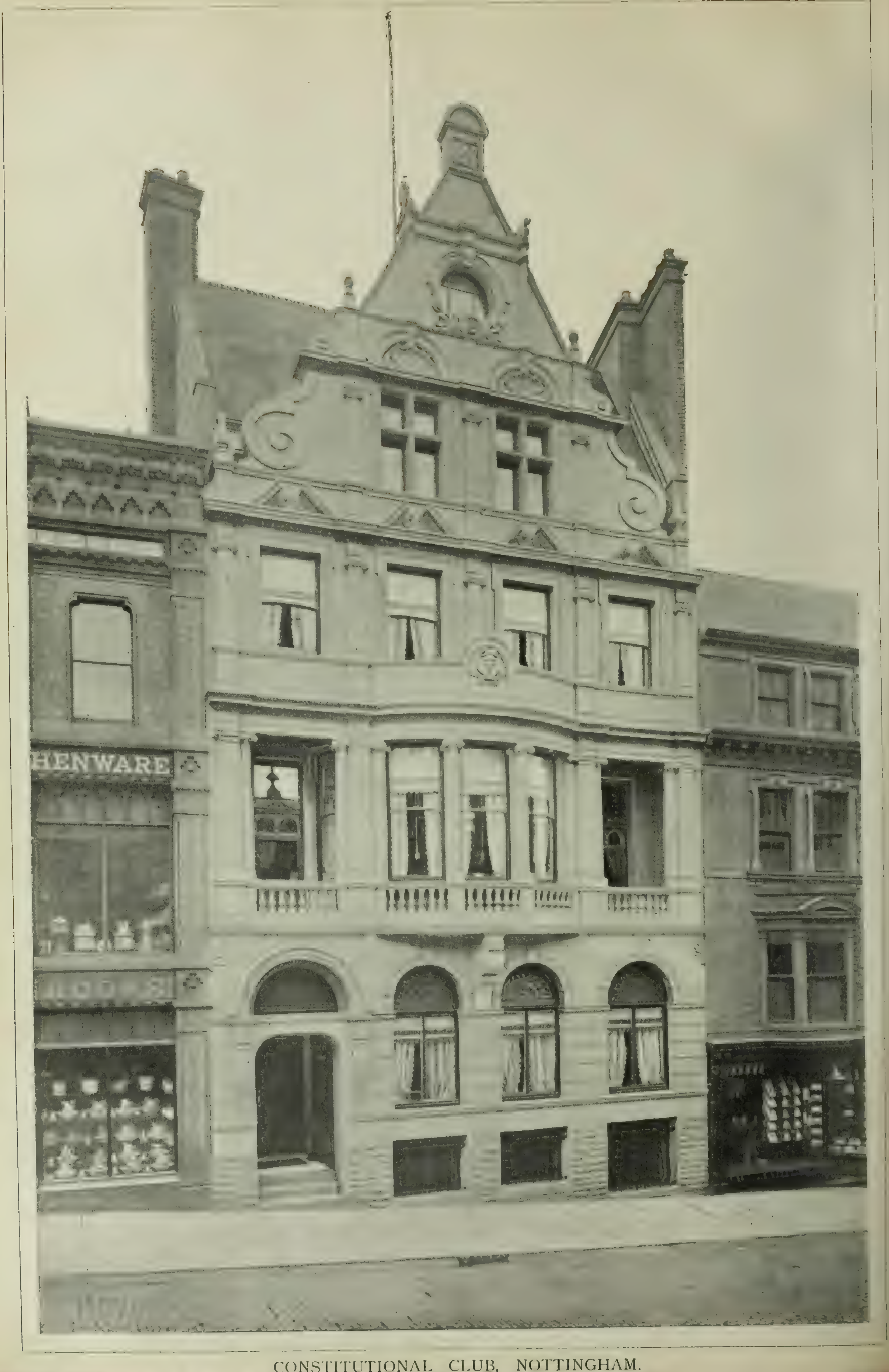
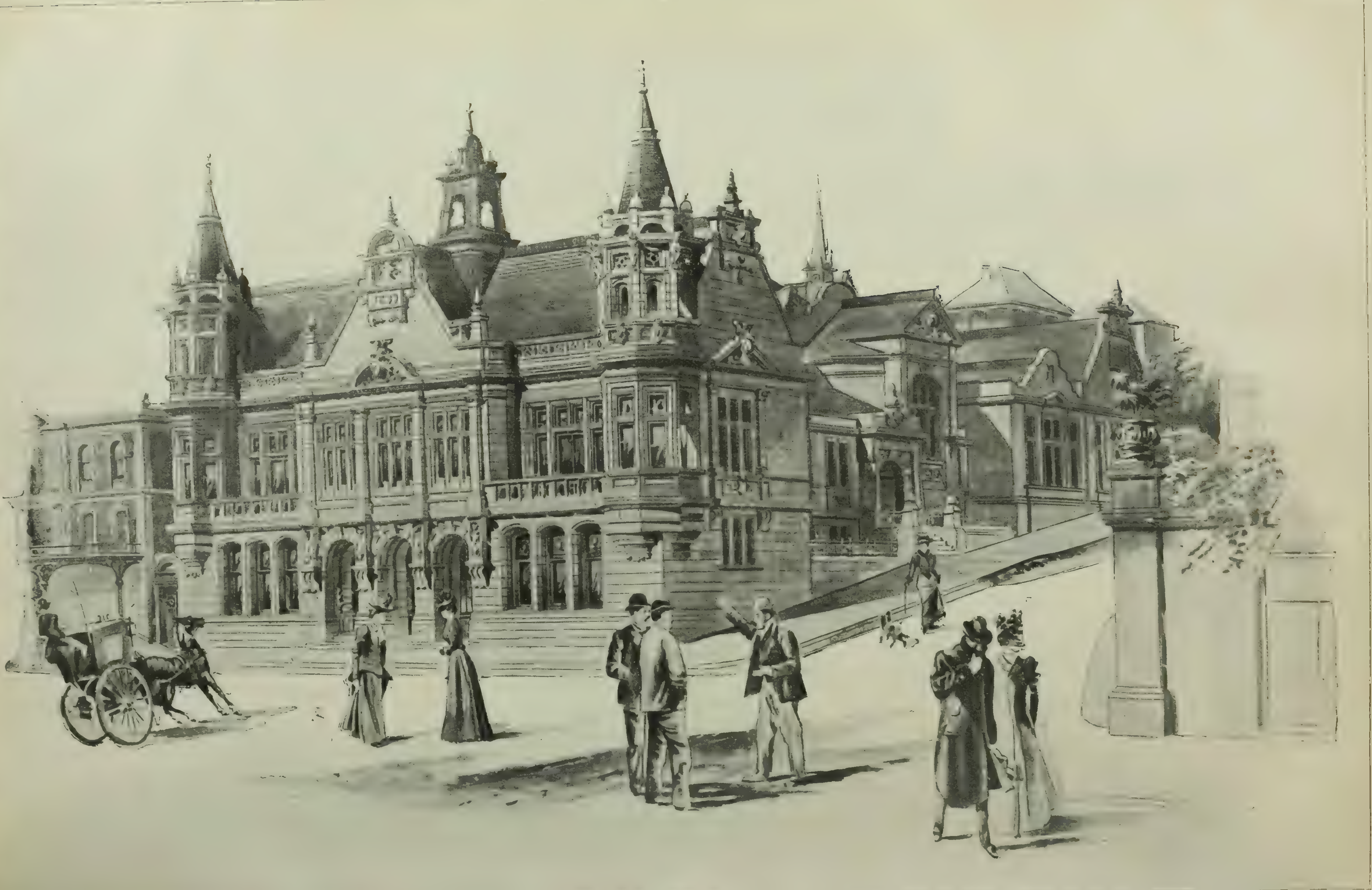


CHOOL, WOOD GREEN.

A.R.I., B.A., ARCHITECT.

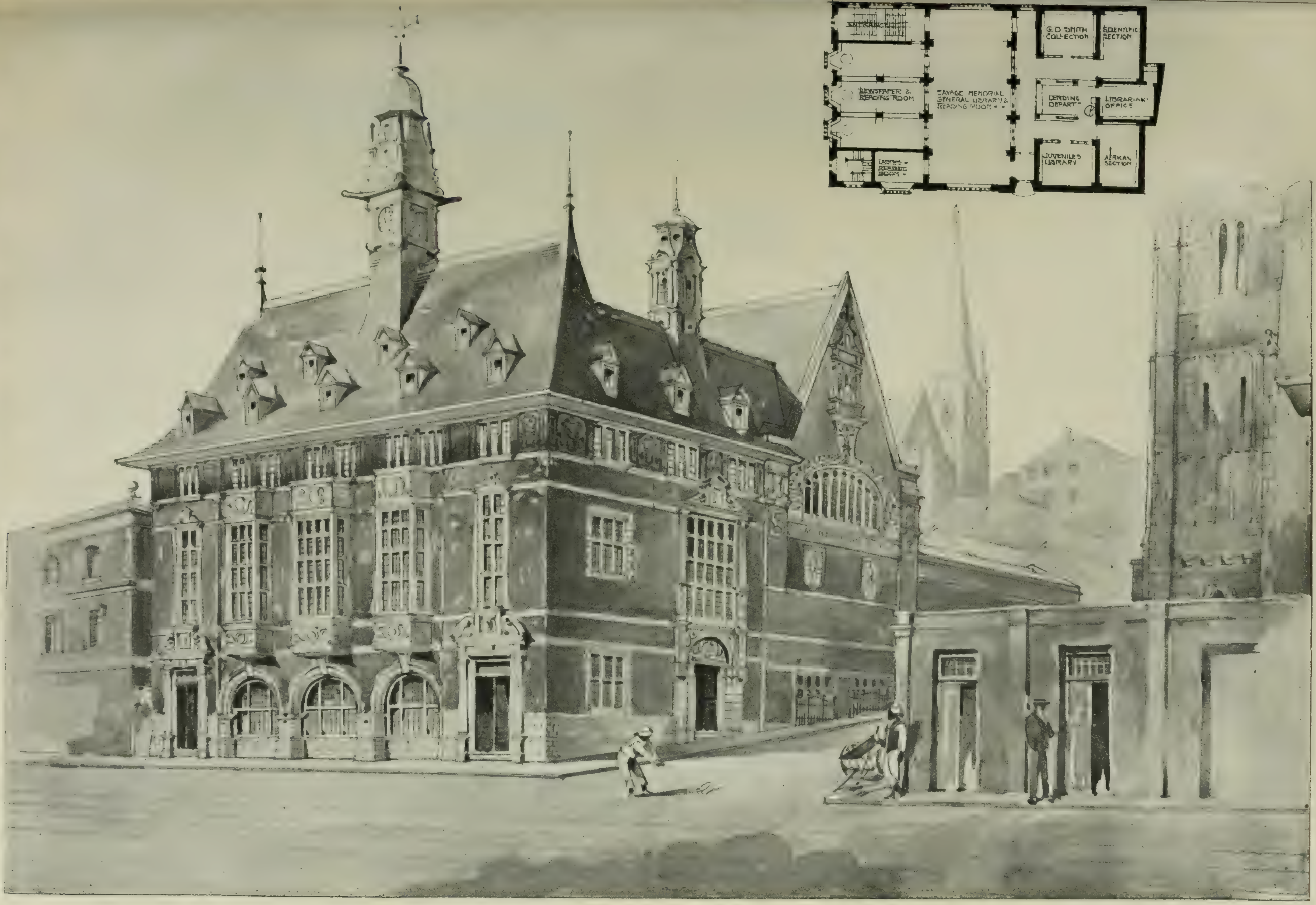


CONSTITUTIONAL CLUB, NOTTINGHAM.

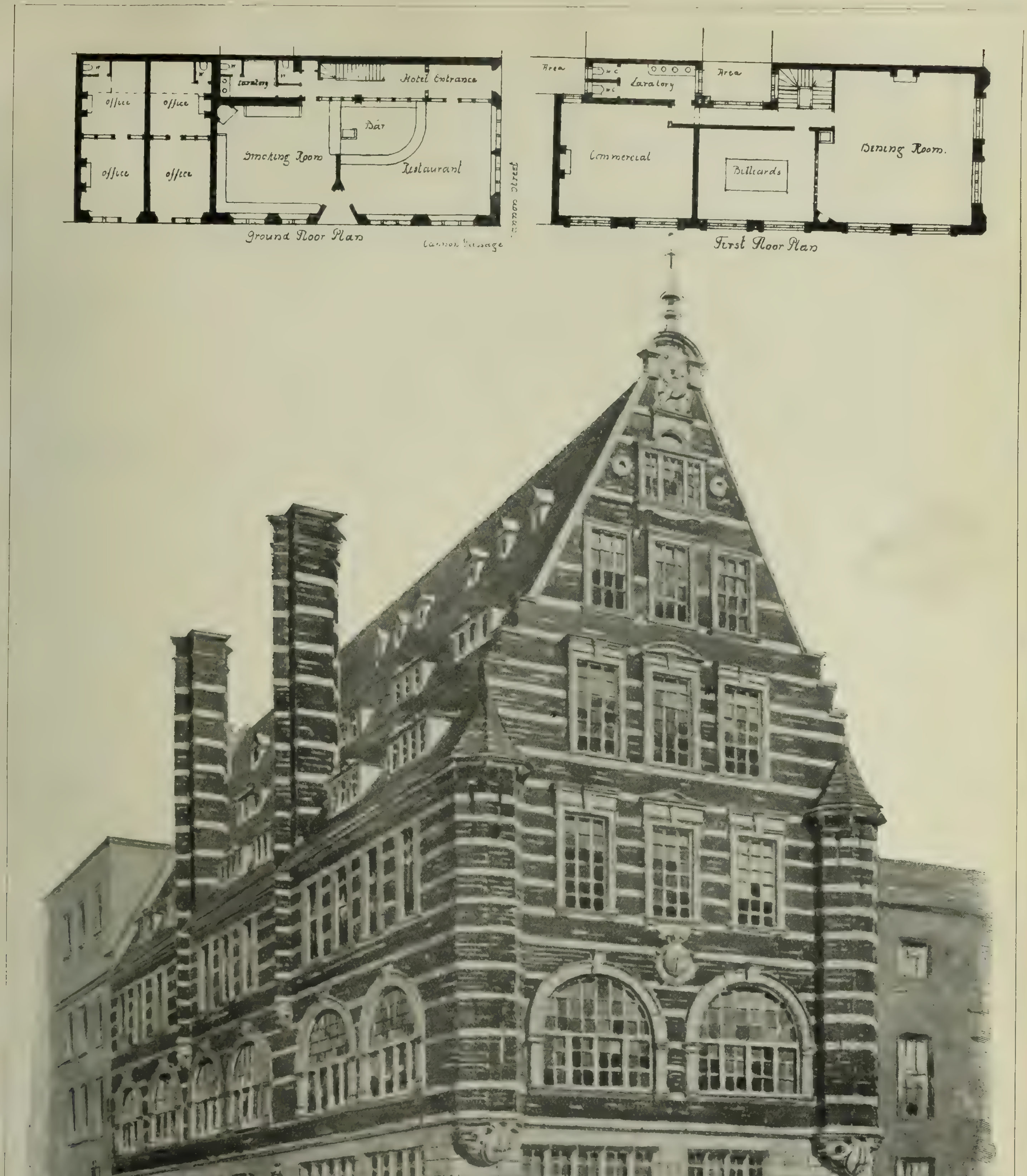


SAVAGE MEMORIAL HALL AND PUBLIC LIBRARY, PORT ELIZABETH.

SELECTED DESIGN, BY HENRY A. CHEERS, ARCHITECT.

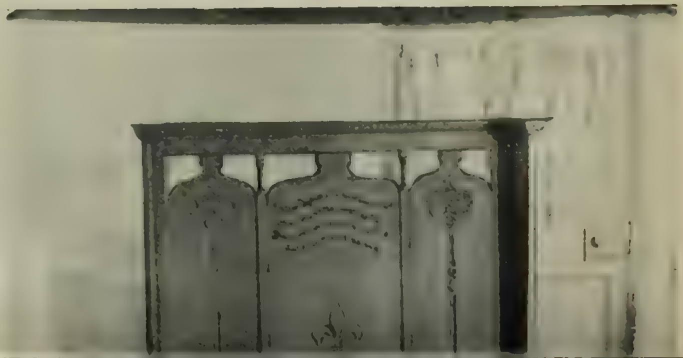


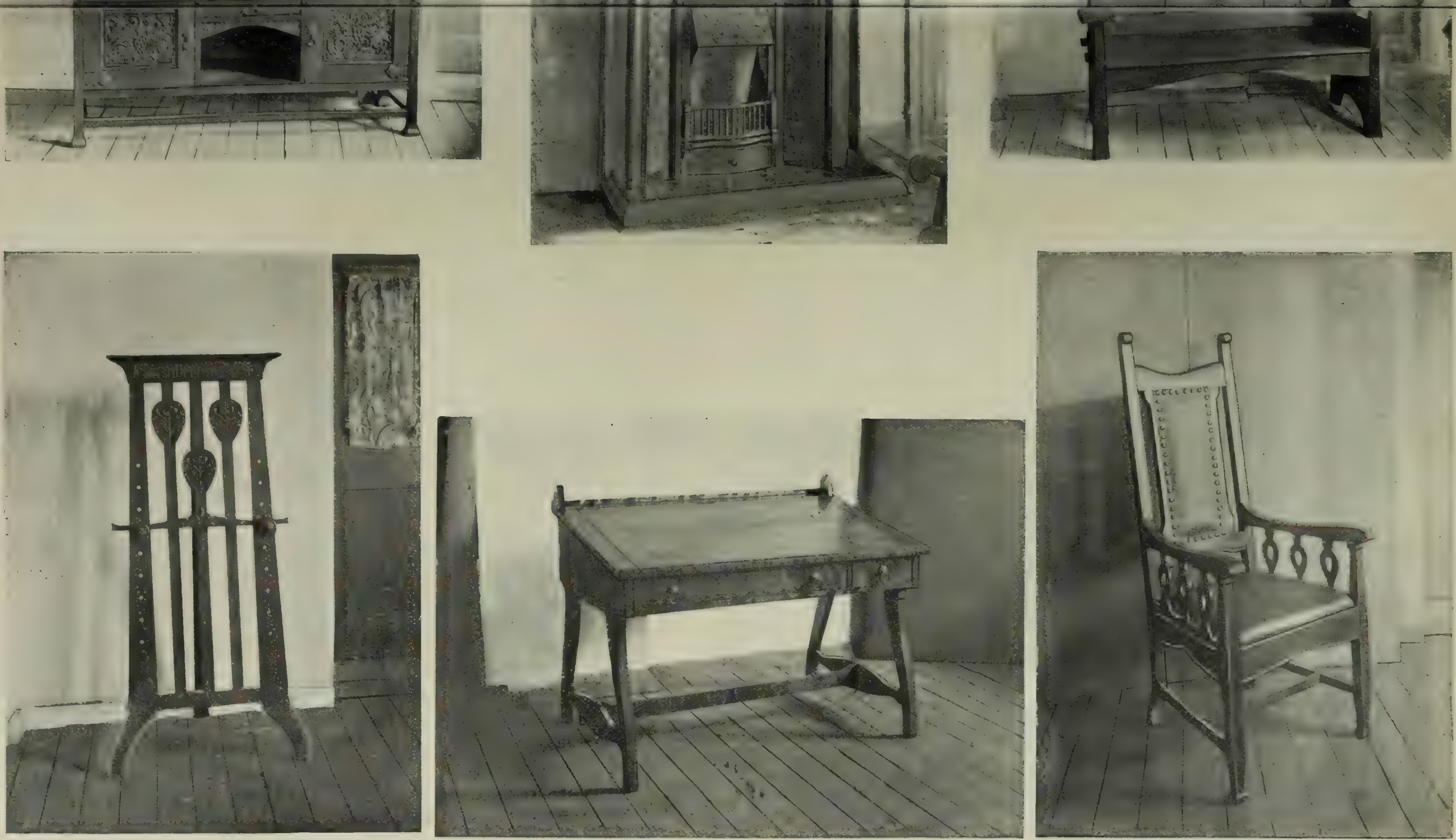
SAVAGE MEMORIAL HALL AND PUBLIC LIBRARY, PORT ELIZABETH.
DESIGN SUBMITTED BY MESSRS. BATEMAN AND BATEMAN, ARCHITECTS.



CANNON STREET HOTEL, BIRMINGHAM.

BATEMAN AND BATEMAN, ARCHITECTS.





FURNITURE FROM THE ARTS AND CRAFTS EXHIBITION.
BY ARTHUR W. SIMPSON.

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FURNITURE FROM THE ARTS AND CRAFTS EXHIBITION.—HIGHER GRADE SCHOOL, WOOD GREEN.—SAVAGE MEMORIAL HALL, PORT ELIZABETH. — CONSTITUTIONAL CLUB, NOTTINGHAM.—CANNON STREET HOTEL, BIRMINGHAM.—SCREEN FROM ST. MERY, PARIS, ETC.

Our Illustrations.

FURNITURE FROM THE ARTS AND CRAFTS EXHIBITION.

Mr. Arthur W. Simpson, of Kendal, sends us the following descriptions of the photographs of his excellent furniture on view in this exhibition in the New Gallery:—Easel made in fumigated oak wax-polished, carving kept flat, with tray for picture. Sideboard in fumigated oak wax-polished with hand-wrought metal handles and hinges; leaded lights of clear glass. Architect's Drawing Table in polished birch, with copper ring handles. Reading Chair in fumed and waxed oak, with spring mattress and loose cushion and back of corduroy, claret-coloured; candle-holders in back to facilitate comfortable reading. Cabinet for china *bric-à-brac*, &c., in Spanish mahogany, oiled and waxed, with boxwood inlay in frieze and on corners of carcase. Pine Mantelpiece, with boxes and seats at side, slight incised carving on back of seats, with candle-holders at side and cupboards in centre; this mantelpiece was oil-stained green. Carving Chair in fumed oak, with cowhide covering; slight embossing on upper part of back and large copper nails round panel. Oak Mantelpiece in own drawing-room, with electro-bronze panelled grate; panels only designed for the Coalbrookdale Iron Co. The mantel is of richly-figured oak, fumed a dark brown, and wax-polished. I may say that the whole idea in this furniture has been to keep it simple, and yet sufficiently relieved by decoration to make it interesting.

HIGHER GRADE SCHOOLS, WOOD GREEN.

In 1897 the Tottenham School Board instituted an open competition for the above schools, and appointed Mr. E. R. Robson to be their assessor. The designs of Mr. A. Morris Butler, of Finsbury Circus, E.C., were placed first, and the schools have just been completed under his superintendence, and were opened in July of this year. The building is of yellow stock brickwork externally, with red brick and stone dressings and tile roof. It accommodates 900 children; 450 girls on the ground floor and 450 boys on the first floor. There is a large central hall on each floor, and the two classrooms adjoining same can be thrown into the hall at will by the use of revolving shutters, thus forming a very large hall for purposes of meetings, &c. In addition to the usual classrooms and schoolrooms there are, in main block, a large chemical laboratory, with balance and storerooms attached, and a drawing-class room; also, in a separate block, large manual instruction and cookery classrooms are placed together with the caretaker's house. The cost was £17,000, and Messrs. Henry Knight and Son, of Tottenham, were the builders.

SELECTED DESIGN FOR THE SAVAGE MEMORIAL HALL AND PUBLIC LIBRARY, PORT ELIZABETH, SOUTH AFRICA.

The subject of our illustration, now being erected by the contractors, Messrs. Dollery and Strang, at a cost of £23,000, was the result of an open competition responded to by some forty architects from all parts. The site had considerable difficulties, light being obtainable on the front and one return side only, the latter having, moreover, a rise of 22ft. from front to back. The lower or ground floor is devoted to a large chamber of commerce, with secretary's room attached, the remainder being laid out in offices from which a rental of over £1,000 per annum is anticipated, owing to the important position of the building facing the Town-hall and Market-square. On the first floor, a plan of which is given, the library proper is placed, with entrances from the two fronts, despite the levels. The feature is the memorial hall or reference library, and in this and the surrounding rooms, which are intended for sectional subjects, readers are to be allowed to help themselves to books; galleries, therefore, surround the rooms, lined with bookshelves on the wall sides, with convenient staircases and lift access. In addition, extensive storage is provided on an upper floor to the rear, as well as special staff entrance and book-mending room, &c., on the ground floor. The newsroom in the front has an elliptical curved ceiling, panelled, and will have the walls arranged in art-gallery fashion, the present library in town-hall having many valuable paintings in its possession. The memorial-hall is in the form of a Greek cross, having a dome to be filled with stained glass in the centre, and arched bays or wings opening out each side, in one of which will be placed a large painted window in memory of the late Mr. John Savage, whose children are contributing handsomely to the expenses of erection. The front and part return to St. Mary's-terrace will be faced with ashlar from the Coega Quarries, S.A., the remainder being brick with cement fronts, the usual method of facing buildings in the locality. Green Westmoreland slates on boarding form the roof covering, and the joinery, dadoes, doors, windows, &c., are principally of teak, polished. Marble mosaic floors and marble columns, with stained glass, are the chief decorative features inside, most of which items are exported from this country, together with the steel joists for the fireproof flooring, electric-light fittings, and numerous other details the colony cannot yet command. The architect is Mr. Henry A. Cheers, of Twickenham.

SECOND PREMIATED DESIGN FOR THE PORT ELIZABETH FREE LIBRARY.

This design obtained the second premium in the same recent competition under an assessor, and was submitted by Messrs. Bateman and Bateman, and H. T. Buckland, of Birmingham; the drawing was hung in the Architectural room of the Royal Academy this year. The materials proposed to be used were roughcast on common brickwork, with stone dressings, and green slates for the roof. A special feature was made externally and internally of the Savage Memorial Hall in the centre of the building, which was to be used as the general reading-room.

THE NOTTINGHAM AND COUNTY CONSTITUTIONAL CLUB.

For description and sketch-plan, see p. 545.

CANNON STREET HOTEL, BIRMINGHAM.

The plans make this design explicit—Portland stone, with Berkshire bricks and green slates, being the materials, with a good deal of ironwork in the construction. Building operations are not yet commenced. Messrs. Bateman and Bateman are the architects, who exhibited this drawing at the Academy this year.

SCREEN IN ST. MERY, PARIS.

The double-page sheet of details of the screen from the church of St. Mery, Paris, and of the door of the Abbey Church, Doubs, Mt. St. Benoist, are by Mr. W. T. Partridge, architect, of New York, whose sketches of the screens in Trinity Church, Fécamp, we reproduced in our issue of Sept. 15 from the *American Architect*, and we are equally indebted on this occasion to our contemporary.

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The town council of Batley have agreed to increase the salary of Mr. J. F. Bromley, gas manager, from £350 to £400 a year.

THE A.A. CONVERSAZIONE.

The annual *conversazione* of the Architectural Association was held at the King's Hall, Holborn Restaurant, on Friday evening, and passed off most successfully. About 500 guests were present, and were received by the President, Mr. G. H. Fellowes Prynne, who was accompanied by Mrs. and Miss Fellowes Prynne, and was supported by the committee. The drawings executed last session in the Studio and School of Design, and also the Students' Prize Drawings, including the excellent work of the water-colour and colour decoration classes were on view, and also Mr. de Gruchy's Pugin drawings of Cornish churches. There was a very large display of photographs taken during the A.A. excursion last August to Salisbury and neighbourhood. These well-executed photos. by Messrs. J. W. Stonhold, Francis R. Taylor, E. W. M. Wonnacott, and others were arranged on three screens, and gave a good idea of the buildings visited during this sketching tour. Among the loan exhibits were cartoons for stained glass shown by Messrs. Percy and A. Bacon and Mr. T. R .Spence, moulded and carved panels by Mr. F. E. E. Schenck, some effective wall-paper designs by Mr. L. A. Shuffrey, and examples of church fittings and furniture by Mr. Alfred Stalman. Some very elaborate specimens of bookbinding executed by students in the L.C.C. Central School of Arts and Crafts attracted attention, and Messrs. S. B. Bolas and Co. lent a selection of photographs of Westminster Abbey. During the evening selections of music were given by the band of the Honourable Artillery Company. Messrs. Percy and A. Bacon proved their versatility by singing a duet, and songs were rendered by Miss Lilian Courtenay, Mr. G. B. Carvill, and Mr. Herbert Passmore. The refreshment and cloakroom arrangements were well managed, and the whole affair was a great success.

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CHIPS.

An iron hall, seating 800 people, built for the Liberals at Stantonbury, Bucks, was opened by Earl Carrington on Saturday. It has been erected by Mr. G. Tranfield.

The Saltash Town Council have under consideration the report of Mr. E Sandeman, C.E., who has been called in to advise on the water supply. Mr. Sandeman recommends the construction of a storage reservoir at Longstone to contain 500,000 gallons, the laying of a galvanised iron pipe 2in. in diameter beneath the river as an alternative means of supply, and the fixing of a pressure-reducing valve on the Plymouth side of the Tamar to take off the excess of pressure in the pipes.

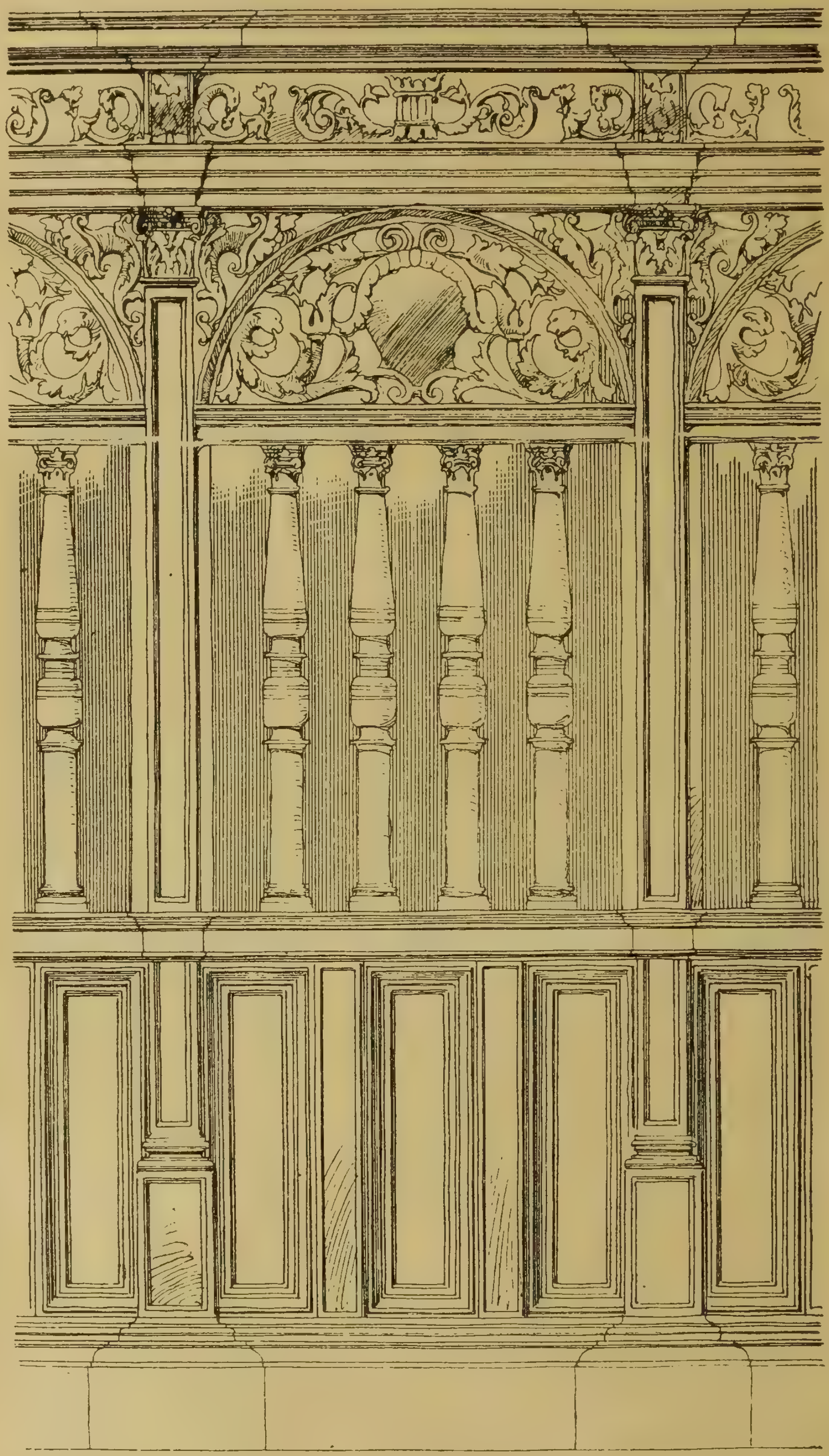
A ceremony to mark the completion of the work of erecting the chimney stalk of the new brewery, Falkirk, took place on the 19th inst. The stalk is by far the highest in the borough, and rises to a height of 200ft. from the surface of the ground. The diameter of the stalk for the first 70ft. is 17ft., and from that point tapers to 10ft. 6in. at the top. The ceremony took place at the top of the stalk, where cake and wine were served to a company, including Mr. P. L. Henderson, Edinburgh, and his assistant, Mr. Shearer; Mr. Rutherford, clerk of works; and Mr. John Gardner, builder.

Mr. Trotter, of the Board of Trade, visited Leeds on Thursday in last week and inspected the Chapeltown and Headingley line, on which it is proposed to run electric cars, and the power station. There were present Mr. Talbot (of the firm of Messrs. Hopkinson and Talbot, the consulting engineers), Mr. Wharam (manager), Mr. Burbidge (electrical engineer), Mr. Jeken (assistant engineer), and Mr. Heppel (representing the Thomson-Houston Co.) The Board of Trade inspector expressed his satisfaction with what he had seen.

The Mayor of West Ham laid, on Wednesday, the foundation-stone of a hospital extension at Plaistow. Mr. E. T. Hall, F.R.I.B.A., of Moorgate-street, E.C., is the architect.

Mr. H. P. Boulnois, inspector to the Local Government Board, held an inquiry at Northwich on Friday, relative to the application of the urban council for sanction to borrow £25,000 for Castle Ward sewerage scheme, and the rural council's application for £4,900 for Winnington sewerage.

The visitors of the Lincolnshire County Asylum at Brasebridge Heath, near Lincoln, have instructed Mr. Albert E. Gough, of London, to advise them in preparing a report upon the state of the asylum buildings, and to prepare sketch plans showing provisions for a central recreation and dining-hall, committee and other rooms for the visitors, additional accommodation for patients and attendants, an isolation hospital, and additions to the administration block.



SCREEN IN "ST MÈRY " PARIS

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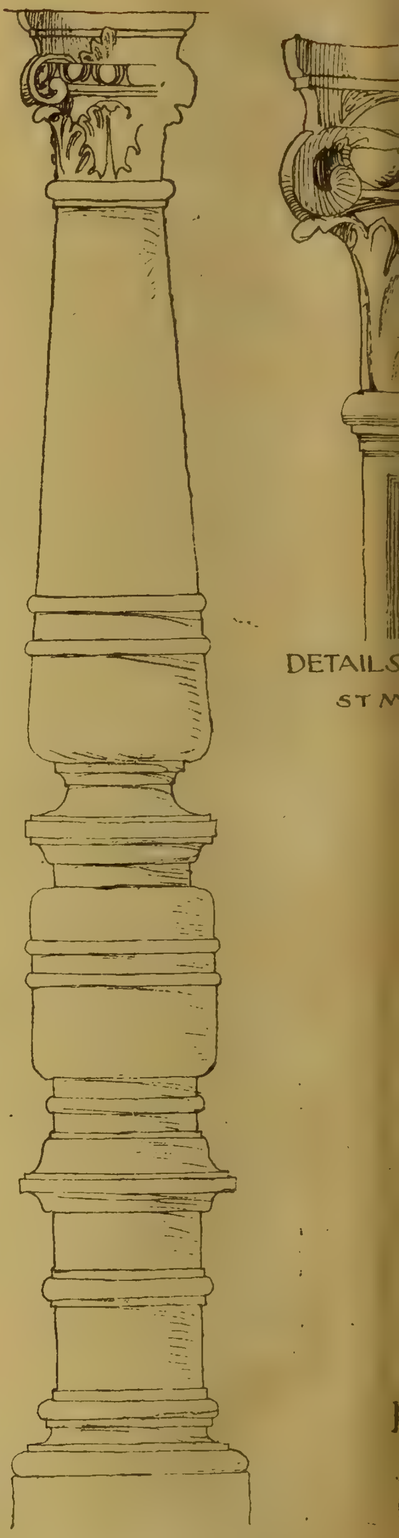

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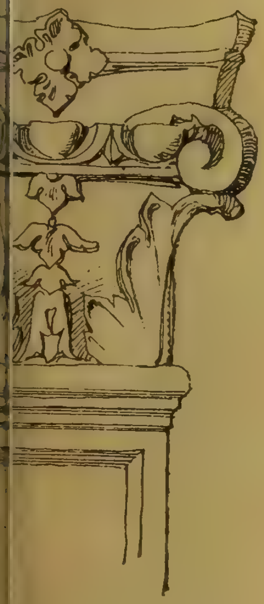

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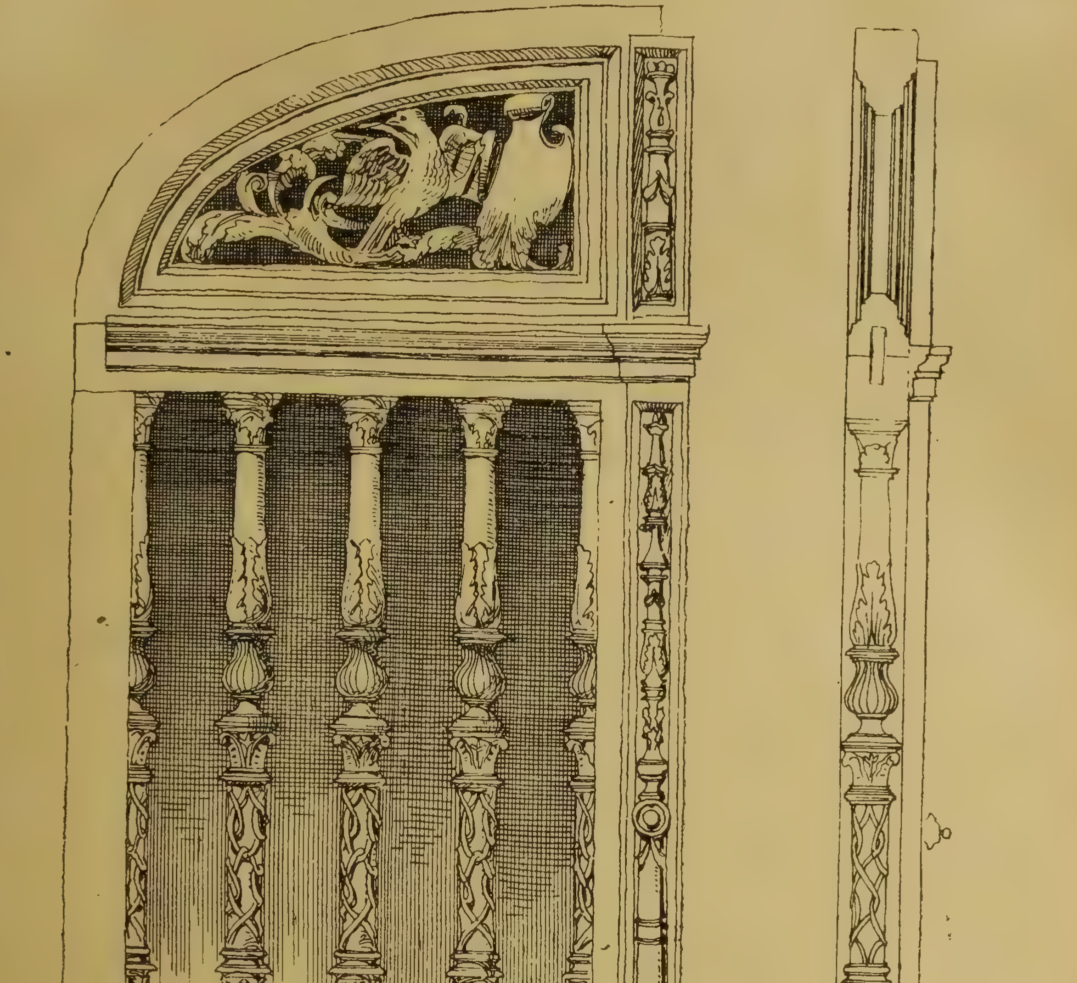

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Engineering Notes.

Birmingham.—The "Queen's Ride," adjoining the lower end of Cannon Hill Park, was formally opened on the 19th inst. by the Mayor. The river Rea, running nearly 1,600 yards from Cannon Hill Park to Calthorpe Park, has for a considerable distance already been straightened and widened, and the strip of land given by Lord Calthorpe on condition that this improvement was made has been laid out for the benefit of those who engage in horse exercise. The length of the ride is 754 yards, and the width 75ft. The sand track for riding purposes is about 13 yards wide, and there is in addition a footpath, having a width of 12ft. The first part of the bed of the road is laid with ashes to insure a good foundation, and on this is placed a substantial bed of sand. An ornamental fence has been erected alongside the footpath, and the ground adjacent planted with shrubs. The entrance gates from Edgbaston-road are of wrought iron, and hung on two brick piers, with terracotta caps. On the centre of the gates the Birmingham coat of arms, emblazoned in heraldic colours, is displayed. Communication between the park and "the Ride" is afforded by a bridge, built with brick and stone abutments and steel decking, paved with wood blocks, the necessary protection being afforded by ornamental rustic palisading. The bridge crosses the stream some little distance beyond the termination of "the Ride." The works have been carried out under the supervision of Mr. John Price, the city surveyor.

The Mayor of Ripon (Ald. A. Wells) performed an interesting ceremony at the Corporation gasworks in that city on Friday by turning on the supply of gas to the new holder, which has just been completed by Messrs. W. C. Holmes and Co., of Huddersfield, this being the concluding contract in the gasworks extension scheme, on which the Corporation have during the last year spent £10,000. The whole of the work has been engineered by Mr. E. E. J. Anderson, the gasworks manager.

The foundation-stone of the Church of St. Agatha, Sparkbrook, Birmingham, was laid on Saturday by the Bishop of Worcester. St. Agatha's is being erected on a site adjoining the Board schools in Stratford-road, and when complete will hold 1,000 worshippers. The plans provide for a nave of six bays with side aisles, and a chancel 40ft. deep. The vestries will be on the south side of the chancel, and a transept with an organ-chamber over on the corresponding north side. The tower will eventually rise to a height of 100ft. The building will be of Staffordshire bricks with Hollington and Bath stone dressings, the interior being faced with buff bricks. The cost will be about £15,000. Mr. W. H. Bidlake, of Birmingham, is the architect, and Mr. J. Bowen, of the same city, the builder.

The Nuneaton and Chilvers Coton Urban District Council have adopted a report by the sewerage committee approving the preliminary plans prepared by the surveyor of works of sewage disposal at Hartshill, and recommending the council to apply to the Local Government Board for sanction to borrow £25,000.

Mr. William Saint, Devonshire-road, Cambridge, was the builder of the Manchester Presbyterian College, Cambridge, opened last week, and described in our issue of the 13th inst., p. 474.

At the meeting, on Wednesday evening last, of the Edinburgh Architectural Society, held in Dowell's Rooms, 25, George-street, the fine set of slides of the "'Louis' Periods of the French Renaissance and English Furniture," belonging to Professor G. Baldwin Brown, were exhibited, members making remarks and criticisms. It was announced that the Edinburgh Designers' Life Club will be resumed again this winter.

The memorial stone of St. James's Hall, Charles-street, Bristol, was laid on Tuesday last. The building will consist of a large hall and gallery, which will accommodate about 500 persons, with large classrooms underneath. There will be a kitchen on the ground floor. The building, which will be in the Renaissance style, will be of brick, with ornamental wood ceiling. The architect is Mr. W. V. Gough, and the building is to be erected by Messrs. Daltrey and Sons, of St. James's, Bristol.

Colonel J. T. Marsh, R.E., a Local Government Board inspector, held an inquiry at the town-hall, Bilston, on Friday, into an application of the local district council for power to borrow £1,700 for works in connection with the water supply, £800 for the extension of the cemetery, and £1,000 for the erection of a depot for stabling and other purposes on land adjoining the Market Hall. There was no opposition.

PROFESSIONAL AND TRADE SOCIETIES.

Dundee Institute of Architecture, Science, and Art.—The 15th annual general meeting of this institute was held last (Thursday) evening at Lamb's Hotel, Dundee, when the report and balance sheet were adopted. The syllabus for the ensuing session is as follows:—Nov. 4, opening lecture, "Art in the Home," by P. H. Thoms. Nov. 18, visit to Villa in West Ferry, by permission of J. Murray Robertson; train leaves East Station at 2.5 p.m. Dec. 2, lecture, "Electricity in Building Work," with experiments, by R. Gibson, C.E. Dec. 16, visit to Caird Hospital and Royal Bank Buildings; members meet at hospital at 2 p.m. Dec. 23, paper, "Some Local Cathedrals," with limelight illustrations, by Charles Soutar. Jan. 13, 1900, visit to Perth; train leaves West Station at 12.45 p.m. Jan. 27, lecture, "Greek and Gothic Abstraction from Natural Forms: a Comparison," with limelight illustrations, by R. S. Douglas. Feb. 10, visit to villas in West End, by permission of Mr. Leslie Ower; members meet at Rockfield-street at 2.15 p.m. Feb. 24, lecture, "Travel, Part of an Architect's Education," with limelight illustrations, by Charles Ower. March 10, visit to Mather's Hotel and surrounding buildings and Park U.P. Church; members meet at hotel at 2 p.m. March 24, lecture, by A. M. S. Richardson. April 9, holiday visit to Glasgow. April 21, visit to Justice and Sons' Works and Kingoodie House; members meet at works at 1.80 p.m.; train to Invergowrie at 3 p.m.

Leeds and Yorkshire Architectural Society.—The council of this society in their annual report state that the membership during the past year has increased from 115 to 121. There are now 60 members, 39 associates, and 22 honorary members. For the prizes offered there was a keen competition, and excellent work was submitted. The silver medal and five guineas, given by the president, went to Mr. W. Driffield for a set of measured drawings of Riddlesden Hall. The prize of three guineas for design was divided between Mr. H. E. Henderson and Mr. R. S. Whincup. Mr. Henderson also gained the president's prize of five guineas for sketches done during the year. The council received a deputation from the Leeds and District Federation of Building Trades Employers, and promised support during the continuance of the building dispute. The unsettled state of labour in the plastering branch was viewed with regret. The conditions imposed in connection with the competitive designs for the Leeds new market were considered, and the president and hon. secretary requested to bring the objectionable clauses under the notice of the Lord Mayor and others concerned.

Concerning the proposed construction of a railway from Berealston to Kelly Bray, Stokeclimsland, the Light Railway Commissioners held an inquiry at the Bedford Hotel, Tavistock, on Wednesday.

The urban district council of Eastleigh and Bishopstoke adopted at their last meeting a report and scheme by Messrs. Lemon and Blizard, of Southampton, for the drainage and sewering of Eastleigh Park and Bishopstoke. The sewers will be five miles in length, and the estimated cost of the undertaking is £15,500. At the same meeting it was decided to divert and improve the Bishopstoke-road at an estimated cost of £3,000.

Mr. C. L. Brereton, C.E., has been appointed by the Scarborough Corporation to report upon the Marine-drive works at Scarborough, and the best means of expediting their progress.

A smoking concert was held on Friday evening, under the presidency of the Birmingham city engineer and surveyor (Mr. John Price), at the Colonnade Hotel, Birmingham, in order to make a presentation of a collection of books from the officials of the public works department of the corporation to Mr. W. F. Newey, who has been appointed engineer and surveyor to the Urban District Council of Nantwich. In making the presentation, the city surveyor said that during the nine years Mr. Newey had been with the corporation he had served them in a highly creditable manner.

The Bishop of London consecrated on Saturday morning the new church of St. Luke's, Kidderpore-road, West Hampstead. It has been erected at a cost of about £13,400, from plans by Mr. Basil Champneys, and was illustrated in our issue of Oct. 14, 1898. Accommodation is provided for 800 persons, and the building materials are red brick and Bath stone. The contractors were Messrs. Albert Estcourt and Son, of Gloucester.

COMPETITIONS.

Ilford.—The first prize of fifty guineas for the best design for laying-out the Green-lane recreation-ground at Ilford has been awarded to William Barron and Son, landscape gardeners, of Elvaston Nurseries, Borrowash.

Plumstead.—Forty designs, comprising 255 drawings, have been sent in for the Municipal Buildings and Public Library, Plumstead. They are on view at the Windsor Castle Hall, Maxey-road, Plumstead (near the vestry hall), daily until Wednesday, 1st proximo (inclusive), between the hours of 10 a.m. and 10 p.m. Mr. Mountford has placed design marked 3 first, No. 30 second, and No. 22 third. None of the names of competing architects are known officially, as the envelopes have not been opened, and will not be opened till the vestry has decided the matter. This will be done at an early date, probably next Wednesday. With regard to the designs generally, it must be admitted that they do not as a whole display any marked architectural ability, even as regards planning. We have no doubt that Mr. Mountford has chosen the most suitable scheme, considering the available sum of about £40,000, not that we think the more expensive proposals any more worthy of adoption. There is a good deal that is commonplace in the chosen design which might well have been obviated. The rusticated columns distinguishing the façades are somewhat lumpy if not coarse in scale. The dome over the municipal offices entrance forms the central feature of the long façade, the hall being located at the rear. There is, however, a skilful balance of parts, and, as a whole, the group makes a consistent composition well adapted to its purpose. The contrivance of the library is very good, with a large borrowers' counter, and having the reference rooms so placed as to obviate the necessity of passing through any other department. A great feature of this plan is the capital crush-room with direct exit to the side street. Stone is proposed for the entire elevation. The drawings suffer from coarseness, but the perspective is delicate and refined. No. 30, the design placed second, is much more original in external treatment; but we are not so sure that the ultimate effect gains thereby, though the big tower adds importance at the end of the main front flanking the big hall, which is situate end on, unlike the chosen plan, which has the hall parallel to the chief elevation. The council chamber is an ugly shape, and too long for effective seating. The library is very similar to the chosen scheme, but not nearly so good. The drawings are careless, but artistic, and indicate a Yorkshire style of work. No. 22, awarded the third place, is lacking in continuity of idea, and looks disjointed, gaining nothing by the contrast of parts which seems to have been relied on. The hall recalls the buildings at Battersea, but its gable is flanked by quasi-towers. The hood over the entrance doorway is not very successful, and the tall turret surmounting the offices block is ungainly and poor. The design, like the last, is in what may be termed the sashed-windowed Classic style, with the vertical lines of the elevations over-emphasised. Although No. 33 has a relatively poor plan, very deficient in its details of contrivance, it ranks architecturally in the first order of merit, even admitting obvious ugliness in some of its leading features, chiefly the centre gable, and perhaps the upper stage of the flanking towers. The hall inside is very Rococo in its handling, but it is distinctly clever, and parts of the elevations are excellent. No. 16 strikes us as among the best of the rest, and No. 8 is refined and well drawn. Others worth naming are 7 and 17; also 23 for its good perspective in pen and ink.

The central technical schools for Cornwall, erected at Truro from plans by Mr. Silvanus Trevail, of that city, were formally opened on Tuesday by the Earl of Mount Edgcombe, who alluded to the generous gift of Mr. J. Passmore Edwards of £5,000 to the building fund, an act which had rendered the scheme practicable.

The death took place on Tuesday night of Mr. John Goad, principal of the firm of J. Goad and Co., contractors, at his residence, Oxford House, Hyde Park-road, Plymouth. Mr. Goad was fifty-six years of age.

Mr. Joseph Barry, architect, Queen-street, Huddersfield, has been nominated, and will be returned unopposed, as member for the Central Ward, in the election on Nov. 1, to the Huddersfield Town Council.

TO CORRESPONDENTS.

We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—W. H. S. and Son.—T. and T.—E. F. and B.—S.—R. Carter.—N. N. and Co.—P. Bros., Ltd.—Verax.

Level.—Heathman's extension ladders and trestles are well made and reliable. Look at their page advertisement on p. xvii. in our issue of Oct. 13, and you will see at the left-hand side near the bottom just what you ask about.

Cheap and Good.—Have you tried the Cameo Woodwork (Messenger and Co., Loughborough)? It is not a mere imitation of carving, but quite a legitimate means of decoration, and you can get some very decent friezes and panels at about half the cost.

T.—Too late; the matter is in our solicitor's hands.

Competitor.—So it was said at the time; but the whole affair was mismanaged from beginning to end. Too late to reopen.

Old London.—You are right; the whole of the eastern side of St. Paul's Churchyard was shut in by houses before Cannon-street was made. About 1854.

J.—We much prefer photographs of completed works, furniture, statuary, and the like. They lend themselves better for reproduction by the process by which most of the illustrations in this issue are produced, the results of which are better than photolithography. Of course, for designs drawings must still be made.

Builder.—You can't do better than at Braby's, 352, Euston-road. Copper, we should think, under the circumstances.

* * *

Correspondence.

PLANS FOR URBAN DISTRICT COUNCILS.

To the Editor of the Building News.

Sir,—I was in similar dilemma some time ago as Messrs. Douglas Young and Co., with this exception, that these by-laws did not specify the material, but simply to deposit plans and specifications, &c., and a resolution passed in their minutes that plans must be on *tracing cloth.* I took legal advice, and proceeded with the work after being informed that the only objection was that the plans were copied by the "sun blue prints" or white lines on blue ground.

The council also were advised that their demand could not be enforced, as it had not been incorporated in their by-laws, and as well against public policy to throw unnecessary expense on those that really complied with the by-laws and were contributing directly towards the rates by their new building. And as the plans were on good tough paper, more lasting than that of the specification, they were bound to accept the "blue printed copy," which was a perfect photo. of contract drawings, of which no hand tracing could possibly be such facsimile.

D. J. L.

* * *

CHIPS.

The town council of Thetford have formally approved and adopted plans prepared by Mr. Herbert J. Green, of Norwich, for rebuilding the town-hall.

At Ossett Police-court, on Monday, Mr. George Oldroyd, builder and contractor, was fined 20s. and costs for failing to submit plans of a new building to the corporation.

At the last meeting of the Chester Archæological Society, Mr. Frank Williams described a portion of a stone cross of 11th-century date found in the city during the excavations on the Duke of Westminster's property at the corner of Pierpoint-lane (Messrs. Wood's new premises). Mr. R. E. Newstead, F.E.S., then described "The Recent Discovery of an Important Roman Building in Bridge-street," on the site of the old Grotto Hotel.

On Wednesday, a new Wesleyan chapel was opened at Nun Monkton, Yorks. Messrs. Monkman and Hornsey were the architects, and Mr. Simpson was the builder. The building cost about £630.

Great improvements have been made at the parish church of Upottery, South-east Devon, at the cost of Viscount Sidmouth. An arch has been opened in the south wall of the chancel, and a transept has been built, which can be used as an organ-chamber. A vestry has also been added. The work has been carried out under the plans of Mr. E. H. Harbottle, F.R.I.B.A., of Exeter. The contractor was Mr. Turner, of Honiton. The dedication was held on Monday week.

The Saturday evening course of lectures on art subjects, under the auspices of Glasgow Corporation, was inaugurated for the season on Saturday by Professor G. Baldwin Brown, of Edinburgh University, in the Corporation Fine Art Galleries. The lecture was on "Gothic Sculpture in its Relation to Architecture." There was a crowded audience, and the chair was occupied by Bailie Bilsland.

The death occurred last week, at his residence in Tollington Park, of Mr. George T. Perrin. The deceased, who was aged 42, was the senior partner in the North London firm of estate agents, Messrs. Robson and Perrin. The interment took place on Thursday in last week at East Finchley Cemetery.

A new Baptist chapel and schools, built at a cost of £5,000, were opened at Nuneaton last week. The buildings are Early English in style, and are built of brick with stone dressings. The chapel seats on the floor area and in gallery 680 persons, and the assembly-room accommodates 350 young people. Mr. John Wills, of Derby and London, was the architect, and Mr. Councillor Smith, of Nuneaton, the builder.

A block of new co-operative stores and a model bakery were formally opened at Fletton, Peterborough, last week. The buildings have cost £6,000, the contract being in the hands of Messrs. Bridgefoot and Sons, and Mr. H. M. Townsend, also of Peterborough, the architect.

At a special meeting of the corporation of Norwich, held last week, a report was received from the sewerage and irrigation committee recording the successful completion of the main drainage of the city. The cost has been £165,000.

The memorial-stones of a new church, which is being built by the Methodist New Connexion at the corner of Villa-road and Soho-road, Handsworth, Birmingham, were laid on Monday. Schools and classrooms are to occupy the ground floor, while the church, which will be above these, will afford seating accommodation for 600 persons. It is to be of red brick with terracotta facings, and the cost, exclusive of fittings, will be £4,080.

Scaffolding is up to the south-western clerestory of St. Alban's Abbey, and a strong staff of stonemasons are busy making good the stonework under the direction of Lord Grimthorpe. It will be remembered this portion of the abbey was "restored" by his lordship half a score or so years ago.

New Wesleyan schools, consisting of ten classrooms and assembly-hall, and accommodating 500, are about to be built in Almondsbury, Huddersfield, from plans by Mr. B. Stocks, of the latter town.

Intercommunication.

QUESTIONS.

[11348.]—**Fire-Stations.**—Will any reader who knows kindly state the best method for drying the hose-pipes of fire-engines?—X. Y. Z.

[11349.]—**What to Charge.**—What should be a reasonable fee for preparing plans for four cottages to receive surveyor's approval? This is all that is required, as the cottages are for a speculating builder, who only wants plans making to receive the sanction of the local authority.—Ignoramus.

[11350.]—**Cements.**—Could any reader inform me of any practical means of ascertaining the quality of cements in their dry state—*i.e.*, by appearance, feel, &c.? Also of adamantine, red tile, and glazed tile.—Technical.

[11351.]—**Colouring Plans, &c.**—I shall be much obliged if someone will kindly give me a list of the different colours representing the various materials used in colouring working drawings and sketch-plans in elevation, plan, and section.—Improver.

[11352.]—**Legal.**—According to my indentures, I cannot practise as an architect within five miles of a certain town. Does this mean that my office alone must be outside the distance, or must my clients necessarily live more than five miles from this town? Or does it mean that the building I put up must stand outside that radius? An answer would greatly oblige.—Difficulty.

[11353.]—**Dispute.**—A contractor undertook to build a certain number of houses for a club. The owners were anxious to let the houses. The contractor would not consent unless the architect gave a certificate indemnifying him for any damage which might be done by the tenants. The architect did so, but omitted to insert the word internally. The contractor took advantage of the omission, and now refuses to complete outside work. The architect was not aware of the mistake for several months afterwards, and he wrote letters to the contractor calling his attention to the unfinished state of the work, and the contractor stated at last that he had a certificate, and that he would do no more. Is there any remedy for this?—Subscriber.

[11354.]—**Packing for Hot-Water Taps.**—I have a lot of hot-water plug gland taps in constant use, and cannot keep the gland from leaking. Will any practical correspondent give instructions for proper packing to prevent this?—Plumber.

[11355.]—**Artesian Well.**—Can any of your readers help me? I have sunk an artesian borehole, in the Pulboro' district, near the station of same name, and on the bank of the river. After sinking to a depth of 40ft. down to the greensand formation, I tapped a good steady supply of clean water, but so heavily charged with iron or other mineral that, though not bad to drink, it is absolutely useless for domestic uses. If spirit be mixed with it, in less than a quarter of an hour, the mixture is as black as ink. If I sink below the greensand, how far is it likely I must go before reaching softer water that can be used? It has been suggested to aërate the present supply to soften it. This means plant, and someone to attend to it. Both the space and money at my disposal are limited. Kindly give me advice.—B. Water.

[11356.]—**Cement for Tufa Stone and Artificial Rockwork.**—I shall feel much obliged if any of your readers can kindly tell me what sort of a cement to make up to stick together tufa stone in such a way that the joints do not show, and the appearance is given of a continuous and unjoined mass of rock; also give a recipe for making artificial rock in imitation of tufa, which could be used in association with it (as stalagmites and stalactites), and overhead in parts where the natural rock could not easily be employed. I have seen some first-rate work in conservatories, &c., where it was impossible to detect the joints, and cannot make out whether ordinary Portland cement mixed with earth colours is used, or whether the tufa "dust" itself is employed in any way.—Tufa.

[11357.]—**Damp.**—I should feel very thankful if readers would give an opinion on the following:—Do you think Virginia creepers have a tendency to make either brick or plastered walls damp, or otherwise? Is there any kind of damp-proof paint to be procured for plastered or brick walls on outside or inside? If a floor is laid with wood blocks, one end wall of which is against high ground, and causes it to be damp, and rots the present wood floor of joists laid with linoleum, if laid with wood blocks, should it be drained to carry off the water from damp end?—Damp-proof.

REPLIES.

[11341.]—**Herring-Bone Work.**—A portion of Roman herring-bone stone walling occurs upon a short length of the inner side of Exeter's old city wall. It is situated on that portion, near the Castle, which faces towards Northernhay. As, however, the wall thereabouts forms the boundary to some beautiful private grounds, whose owner enjoys the reputation for viewing would-be visitors as intruders rather than otherwise, the opportunities for examining it are few nowadays. The former proprietor, a most genial old lady, who died a few years ago, always gave a most cordial welcome to callers interested in things archæological.—Harry Hems.

[11342.]—**By-Laws.**—(1) Is not the by-law quoted *ultra vires?* Under what statutory or other authority is a by-law made which aims directly at putting a limit on the height to which a new building, whether in a new street or an old street, is to be carried? (2) As to the second question, "J. O." may be referred to Sec. 159 of the Public Health Act, 1875, for one definition of a new building which may suffice in the case. For the rest, the point seems to depend on the building line, and perhaps on the by-laws as to open space in front of a new building, if any such by-law is in force in the district.—P. C.

* * *

Ex-Alderman Hepworth has presented to the Leeds Art Gallery a beautiful painting, entitled "Back to Life," by Professor Herkomer, R.A.

LEGAL INTELLIGENCE.

The Protection of Workmen on Buildings.—The City Coroner of Birmingham (Mr. I. Bradley) held an inquiry at Victoria Law-courts on Monday concerning the death of Walter Boughton (25), journeyman bricklayer, West View, Clent, who fell from a building at Aston on Saturday morning. Mr. S. H. Knyvett (her Majesty's inspector of factories) was present during the inquiry. The deceased was engaged with another man in tiling the roof at the Higher-grade Schools, Whitehead-road, Aston, which are being erected by Messrs. John Bowen and Sons. There was no protection for the men working on the roof, the foreman stating that they had not had time to raise the scaffolding, and the deceased slipped while walking along the cornice and fell a distance of 45ft. to the ground. He was conveyed to the General Hospital, where he died shortly after admission. The jury returned a verdict of "Accidental death." Mr. Knyvett said it was a very great pity that some measure of protection was not afforded under the Factory Act to persons employed on buildings, such as there was to those employed in factories. In a case of this sort if it had come under the Factory Act, they would have been bound to have provided some protection. The coroner asked the inspector if he himself could not lay down some general rules, but Mr. Knyvett replied that the factory inspectors had no power to compel builders to provide fencing or safeguards. If they had had such power, it would have been exercised in the case before them. The coroner said that it occurred to him that the Home Office might issue some kind of order. Mr. Knyvett: They have no power. The Coroner: I think I shall write to the Home Office myself. Mr. Knyvett: I shall support you. Mr. Shipley (the foreman) said that it would be a good thing for the builders if certain rules were laid down as suggested.

In re J. L. P. Sanderson.—In the London Bankruptcy-court on Tuesday, an application was made for discharge, the bankrupt, James Lyon Playfair Sanderson, being described as a brick manufacturer, of the Ashstead Brickworks, at Ashstead, Surrey, formerly carrying on business as a tea merchant at St. George's House, Eastcheap, E.C. Mr. A. H. Wildy, Official Receiver, reported that the proofs of debt and the probable claims not yet proved amounted together to £22,511, and that the assets would realise about £184. He alleged the statutory offences (1) that the debtor had contributed to his bankruptcy by rash and hazardous speculations, (2) that he had continued to trade after knowing himself to be insolvent, (3) that he had omitted to keep proper books of account, and (4) that his assets were not of a value equal to 10s. in the pound on the amount of the unsecured liabilities. The speculations referred to were in connection with the Ashstead Brickworks, and were rash, having regard to the bankrupt's lack of capital and small experience of the brickmaking trade when he engaged in it. The bankrupt explained that the works would have been a success but for the action of the fourth mortgagee of them, who pressed him for interest before he had a chance of earning it. Mr. Registrar Brougham was clearly of opinion that the venture was a rash and hazardous speculation, and had contributed to the bankruptcy. It also appeared that liabilities to a large amount had been contracted by the bankrupt after he knew he was insolvent. The allegation as to the books of account was a small matter, and related to the books of the brickmaking business only. On the four grounds reported by the Official Receiver the discharge would be suspended for three years from May 2 last, when the public examination was concluded.

Re Joseph Challender.—This bankrupt, who was formerly a sanitary engineer and plumber, trading in Manchester, applied at the Manchester Bankruptcy-court on Monday for his discharge. The report of the Official Receiver stated that the liabilities to rank for dividend amounted to £1,228 6s. 7d., and the assets realised £3 13s. 8d., but in addition £50 had been recovered from property of the bankrupt which might possibly yield a further sum of £100. The debtor had not filed any account explaining his deficiency, and stated that his books of account were lost. Commenting upon the fact that the debtor had sold his engineering and plumbing business on the eve of his bankruptcy, the Official Receiver remarked that such sale seemed to have been a most improper one. In conclusion, the Official Receiver alleged that the bankrupt had been guilty of various offences under the Act. The Deputy Judge suspended the discharge for four years.

An Architect's Action.—At the Newcastle County-court, on Oct. 19, before his Honour Judge Greenwell, Thomas Palmer Bennett, architect and surveyor, brought a claim to recover £8, balance of amount due for preparing plans and bills of quantities of a laundry proposed to be erected by Joseph Armstrong, brewer's agent, the defendant, at Benwell. The latter counterclaimed £37 for alleged negligence of the plaintiff as architect. Evidence was given by the plaintiff that when he sent the plans and quantities to the defendant, on the understanding that they were to be shown to his son, defendant had kept them and had them photographed. After hearing evidence on behalf of the defendants and in support of the counterclaim, his Honour found a verdict for Mr. Bennett, and assessed his payment for work done on the basis of 1 per cent. on the probable price of the building—£1,500—and dismissed the counterclaim.

Claim Against Builders.—At the Lewes County-court last week, Messrs. Aylwin and Campbell, Newhaven, sued Messrs. Osborne and Co. for £50 for bricks supplied. Stephen Moore, foreman for plaintiffs, produced the delivery books, showing that the defendants had received the number of bricks charged for in the account. Mr. Campbell produced the ledger, and gave particulars of the account, showing that the amount charged for was owing. Mr. Aylwin gave corroborative evidence. The defence was that after the houses were finished, they were measured, and there was a deficiency of 33,000 bricks. Defendant's foreman gave evidence and denied any knowledge of certain quantities of bricks alleged to have been delivered. His Honour, Judge Martineau, gave judgment for the plaintiffs for the amount claimed, with costs.

Alleged Fraud and Secret Commissions.—At Marlborough-street Police-court, on Tuesday, Richard Howe, 43, a foreman joiner, Brackenbury-road, Hammersmith, was charged with falsifying the books of his employers, Messrs. Waring and Gillow (Limited), of 181, Oxford-street, and with forging and uttering an order with intent to defraud them. Mr. Bodkin, in opening the case, said that in addition to their West-end establishment, Messrs. Waring had factories and warehouses at Cambridge-road, Hammersmith, where Howe had been employed as foreman. It would be alleged that the prisoner had altered an order for two standards of timber to 22 standards, by the addition of the figure 2, after the order for the smaller quantity had been signed by the manager. When questioned about the matter, he made a statement to the effect that if he gave an order for a large quantity of wood the timber merchants had promised him a secret commission of 2½ per cent. upon the order. It was suggested, in consequence, that the order had been altered so that Howe might receive the commission, which must eventually come out of his employer's pockets. The matter was considered to be of such importance to large firms and employers of labour that Messrs. Waring felt bound to take proceedings. Evidence having been given, Mr. Plowden remanded the prisoner for a week on bail, in two sureties of £50 each.

Someone Had Blundered.—The London County Council were summoned on Tuesday at the South-Western Police-court for unlawfully allowing a newly-erected building to be occupied as a dwelling-house without first obtaining a certificate as to the sufficiency of the water supply from the local authority, the Battersea Vestry. It was stated that the defendants had erected a building at the Fire Brigade Station, Battersea Bridge, and had not applied for the necessary certificate. Mr. Andrews, from the Solicitors' Department of the Council, said there had been an oversight on the part of an official. Mr. Lane, Q.C., inflicted a fine of 5s., with 2s. costs.

The N.A.P. Window Company (Limited).—Under the compulsory winding up of this company the adjourned meetings of creditors and shareholders were held on Friday at the Carey-street offices of the Board of Trade, Mr. H. Brougham, Official Receiver, presiding. The statement of affairs showed liabilities £13,986, of which £8,957 were expected to rank for dividend, and assets £3,992, after deducting £4,931 for claims of debenture-holders. The chairman reported that the meeting stood adjourned on two previous occasions to enable an offer to be submitted. Since the last meeting, Mr. Tilley, the receiver for debenture-holders, had received from the Express Contract Company an offer for the assets. It was proposed to allot to the creditors of the old company fully-paid shares in the new N. A. P. Window Company of the face value of their proved claims. As regarded the debenture-holders, the Express Contract Company were prepared to pay in respect of each £5 debenture £2 in cash and £3 by the allotment of fully-paid "B" cumulative preference shares of £1 each in the Express Contract Company. The debenture-holders had already assented to the arrangement subject to the approval of the Court. Resolutions were passed accepting the offer and appointing Mr. A. A. Yeatman, chartered accountant, as liquidator to carry out the sale.

A fresh survey of the Burma coast will be begun by the Indian Marine during the season 1899-1900.

Under the presidency of Sir William H. White the Institution of Mechanical Engineers will open its new Session this (Friday) evening with its first of a series of monthly meetings.

WATER SUPPLY AND SANITARY MATTERS.

Birmingham.—The Royal Commission on Sewage Disposal visited Birmingham on the 19th inst. for the purpose of inspecting the Birmingham Tame and Rea Drainage Board's farm. The members present were Sir R. Thorne-Thorne, K.C.B., F.R.S., &c., Sir Michael Foster, K.C.B., F.R.S., &c., Professor Ramsay, F.R.S., Dr. J. B. Russell, Colonel Harding (Lord Mayor of Leeds), and Messrs. T. W. Killick, C. P. Cotton, and F. J. Willis (secretary to the Commission). They were met at New Street Station by Mr. William Harris (clerk to the board), and went to the council house, where they were introduced to the Lord Mayor and other members, and Mr. Charles Hawkesley, C.E. (consulting engineer to the board). Subsequently these gentlemen, with the Commissioners, drove to Saltley, and inspected the sewage disposal works, including the experimental beds now in process of construction for the bacterial treatment of sewage.

Edinburgh.—At a meeting of the works committee of Edinburgh and District Water Trust on Monday, an inventory with valuation of the plant in connection with the Talla reservoir contract by Messrs. Laird and Sons, valuators, Glasgow, was submitted, showing that the total value of the plant, huts, sheds, and other works left on the ground by the late contractors amounted to £10,953. It was left to Mr. White Millar, the law agent of the Trust, to intimate the amount to the liquidator and trustee on the different estates. A schedule and specification for the reletting of the contract was, it was stated, expected to be ready in the course of a few days.

Haydon Bridge.—The Hexham Rural District Council, at their last meeting, decided to adopt the scheme of water supply for Haydon Bridge prepared by Mr. Harry W. Taylor, A.M.I.C.E., of St. Nicholas' Chambers, Newcastle-on-Tyne and London. The water will be obtained from copious springs issuing from the gritstone measures, and will gravitate to a concrete service reservoir holding 70,000gal., and from thence by distributing mains throughout the village. The total length of water-mains is about seven miles; the cost of the whole scheme is about £3,700.

CHIPS.

The Bristol Docks Committee and the Dockisation Commitee agreed on Monday to bring pressure to bear upon Sir J. Wolfe Barry, Mr. Benjamin Baker, and Mr. Hurtzig to complete their reports on the dockisation of the River Avon by April next.

A presentation took place on Friday evening at the Tower Grounds, New Brighton, when Mr. Bartlett, electrical engineer of the tower, was the recipient of a marble clock and a pair of ornaments to match from the officials and staff of the tower.

A new Radical club is being erected at Camberwell, from the designs of Mr. A. J. Perriam, architect, London, and special attention has been given to the ventilation, which will be carried out on the Boyle system.

New bank buildings are being completed in Dublin, facing the Rotunda in Cavendish-row, at the junction of Cavendish-row and Great Britain-street. They occupy the site of the "rents" erected a century since by William Ralphson, who endeavoured to introduce into Dublin the system of dwelling in flats. The new bank has been erected by Messrs. Dockrell and Sons, builders, of Dublin.

A full-length portrait was presented to Dr. Percival, Bishop of Hereford, on Tuesday night, by the laity and clergy of the diocese, to add to the collection of portraits of bishops at the Palace. Both this and the original portrait, which is for the hall of Trinity College, Oxford, were painted by Mr. H. G. Riviere, on the occasion of the bishop's recent marriage.

The mayor and corporation of Chatham have just had erected in their new town-hall a fine illuminated turret clock, from the designs and plans of Lord Grimthorpe, which shows the time on three illuminated dials, 6ft. 6in. each in diameter, and strikes the hours on a bell weighing 1ton 1cwt. 2lb. The work was executed by Messrs. W. Potts and Sons, clock manufacturers, Guildford-street, Leeds, who are now erecting East Ham Town Hall clock and bell and Carlisle Town Hall clock.

On Saturday two thatched-roof houses known as Tynyffrith, situated between Riviere's Victoria Palace and the Craigydon Parade, Llandudno, were demolished. These landmarks of old Llandudno had been the home of the Gogarth and the Tynyffrith family for over three hundred years, and ancient histories state that Llewelyn the Great sought refuge at Tynyffrith when he had to flee from his enemies. The houses were a source of attraction to visitors, and many will regret their disappearance, but they were a great stumbling block to the proper development of the Craigydon end of Llandudno.

Our Office Table.

General sympathy will be felt for the ratepayers of West Ham in the great loss sustained by the destruction by fire of the handsome free library and technical institute and museum in the Romford-road, Stratford. The fire broke out early on Monday morning, and, owing to the delay in getting firemen owing to the fog and to the situation several miles outside the Metropolitan area, the flames could not be mastered until the upper part of the building had been gutted, and thousands of books and other treasures destroyed. A fireproof floor enabled the ground floor to be saved from material injury. The building was erected from designs by Messrs. Gibson and Russell, Messrs. Shillitoe and Sons, of Bury St. Edmunds, being the builders, and it was opened on October 6 last year by Mr. J. Passmore Edwards, who had contributed largely towards the outlay. The loss is estimated at from £60,000 to £70,000.

The National Society for Checking the Abuses of Public Advertising, of which Mr. Alfred Waterhouse, R.A., is the moving spirit, intends to approach the Government with a view to suggesting that Ministers should themselves take steps to amend the Local Government Acts in the direction of giving general powers of regulating advertising display to the existing local representative bodies. The society has always urged that in the existence of local associations, concerned for the general defence of all the picturesque amenities of the districts for which they are formed, lies the main hope for the future as regards its work. The society also hopes to enlist the interest of corporations, town and county councils, &c., and to obtain support in making representations to railway companies, large hotels, and restaurants, setting forth reasons for believing that they could, by abandoning or modifying the practice of exhibiting advertisements on their premises, consult their own interest as well as the general good.

The London Council discussed, on Tuesday, at great length, the reiterated recommendation by the Parks Committee that the old Tudor House in the Bromley recreation ground should be cleared away, and finally referred it back by 59 to 41 votes. Another long debate took place on recommendations of the Housing of the Working Classes Committee for the clearing of four insanitary areas in different parts of London at an estimated outlay of over £500,000. The recommendations were ultimately approved. The Westminster improvement scheme in the amended form now submitted by the committee was also approved. It was fully described in our last issue, p. 503.

The London County Council are recommended by Mr. Alexander B. W. Kennedy, F.R.S., the expert engaged to advise the Council in connection with its electrical tramway and light railway schemes, to acquire sufficient land in the neighbourhood of their depot in Camberwell New-road for the erection of one large generating station which would provide the necessary motor-power for all the Council's tramways on the south side of the Thames. The estimated cost of acquiring such land is stated to be about £90,000, and the Highways Committee of the Council recommend that the necessary powers for the compulsory acquisition of the property should be sought in the London County Council Tramways (Electrical Traction) Bill which is to be promoted in Parliament next session.

At Carpenters' Hall, London Wall, on Thursday evening in last week, Professor Henry Robinson, M.I.C.E., continued the series of lectures on "Sanitary Building Construction." The professor at the outset pointed out the great importance of perfecting the sanitary arrangements of buildings with the object of protecting the inmates as far as was humanly possible from outbreaks of disease. He insisted as a general principle that house drains should be laid on straight lines from point to point, with manholes or lampholes, and should be of a size of not less than 4in. The velocity should be 2ft. or 3ft. per second, and, if that could not be obtained by the natural flow of sewage, automatic flushing-tanks should be provided. It was highly necessary, too, that drains should be well ventilated. On the subject of cisterns he remarked that where water had to be stored, owing to the house being supplied on the intermittent system, it was imperatively necessary that the cisterns should be so placed as to make it impossible for the water to be contaminated by impure air from any source. Slate cisterns were best adapted for the storage of drinking water, though they were liable to leak at the joints, and were heavy and expensive. The proper jointing of house drains, he urged, was a most important matter. There was no more vital work than the laying of house drains and sewers, and the men engaged in putting in the former especially should be under the most careful supervision. Bad workmanship was often directly responsible for the outbreak of disease, and the mischief resulting was not known, and could not be repaired, until someone was ill or dead. The subject he seriously commended to the closest attention on the part of his hearers.

The doctors in Harley-street have gained a victory in regard to the wood pavement about to be laid down in that thoroughfare. It will be remembered that they objected to the common whitewood blocks which the Marlebone Vestry had bought, on the ground that their use could not fail to prove detrimental to the health of the residents. The vestry evidently became alarmed at the many distinguished authorities who favoured them with this view of the subject, and by an overwhelming majority the resolution to use whitewood blocks has been rescinded, and the decision has been arrived at to lay the thoroughfare with the hard red Australian wood which the doctors recommended, and further to treat the blocks before laying them with a preservative antiseptic.

The corporation of Liverpool have received a report stating that during the past year of office the health committee have laid down 22 miles of permanent way for tramways, while 6½ miles of carriage way have been constructed, and 55,601 square yards of footpaths, &c., have been flagged. For telegraph wires and other electrical purposes they have laid 107½ miles of trenches, and seven miles of sewers have been reconstructed. Some 308 miles of main sewer have been flushed during the year, and the sewers of 132,706 houses have in the same period been flushed twice. They have removed 282,000 tons of refuse in street cleansing, 132,000 tons of which had been consumed by destructors, and 149,000 tons taken out to sea. The clerical and general work of the city engineer's department showed that 56,000 reports, letters, &c., had been dealt with; bills had been rendered for works executed to £53,665. The Building Plans Committee have dealt with plans for 2,673 dwelling-houses, workshops, &c., while 2,465 new dwelling-houses have been erected in the city during the past year. These figures suggest the steady progress and continued prosperity of the city during the present year.

Some time ago the committee of the Corporation of Oxford was appointed to consider the housing of the working classes of that city, and it now reports that a suitable dwelling for a working man's family should be a house with not less than three bedrooms. The inquiries made by the committee elicited the fact that no suitable house could be found in Oxford for a working man under 6s. shilling per week. Having established this fact, the committee next instituted inquiries with a view to ascertaining the cost at which dwellings with three bedrooms could be constructed, and it has come to the conclusion that this could be done in Oxford at a total cost, including land, of about £220. It further reports that "such houses, if provided by the Corporation of Oxford, allowing for interest at 3 per cent., sinking fund, repairs, cost of collection, and insurance, could be let at a rental of from 4s. 3d. to 4s. 6d. per week." The report contains a strong recommendation to the Corporation of Oxford to provide healthy dwellings for the working men, at convenient disaances from the centre of the city.

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MEETINGS FOR THE ENSUING WEEK.

Wednesday.—Royal Archæological Institute. 4 p.m.

Friday.—Architectural Association. Discussion Section. "Brasses," by Geo. H. Smith, 56, Great Marlborough-street, W. 7 p.m.

* * *

The Chelsea Vestry has offered £2,000 for a strip of the famous Chelsea Physic Garden. The land is needed for the purpose of road widening.

A new chapel in connection with the United Methodist Free Church is being erected at Armley, near Leeds, at a cost of £3,800. The memorial-stones were laid on Saturday.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	,,	9 0 0
Wrought-Iron Girder Plates	5 15 0	,,	6 10 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£12 12 6	...	£12 17 6
Best ditto	13 2 6	...	13 7 6

	Per ton.		Per ton.
Cast-Iron Columns	£8 15 0	to	£9 15 0
Cast-Iron Stanchions	8 15 0	,,	9 15 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised.	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 15 0	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	57½p.c.
Water-Tubes	52½
Steam-Tubes	47½
Galvanised Gas-Tubes	42½
Galvanised Water-Tubes	37½
Galvanised Steam-Tubes	32½

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	18 0 0	,,	19 0 0
Pig Lead, in 1cwt. pigs	17 0 0	,,	18 0 0
Lead Shot, in 28lb. bags	20 0 0	,,	21 0 0
Copper Sheets, sheathing and rods	93 10 0	,,	94 0 0
Copper, British Cake and Ingot	78 10 0	,,	79 0 0
Tin, Straits	146 0 0	,,	147 0 0
Do., English Ingots	150 0 0	,,	151 0 0
Spelter, Silesian	22 7 6	,,	22 12 6

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 5 0	,,	15 5 0
Quebec Pine, yellow	,, ...	5 5 0	,,	7 0 0
,, Oak	,, ...	4 7 6	,,	6 5 0
,, Birch	,, ...	2 15 0	,,	4 12 6
,, Elm	,, ...	4 17 6	,,	5 10 0
,, Ash	,, ...	4 0 0	,,	5 0 0
Dantsic and Memel Oak	,, ...	3 0 0	,,	4 0 0
Fir	,, ...	2 10 0	,,	3 10 0
Wainscot, Riga p. log	,, ...	4 2 6	,,	5 15 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 5 0	to	£26 15 0
,, 2nd	15 5 0	,,	18 10 0
,, 3rd	9 5 0	,,	10 15 0
Canada Spruce, 1st	9 5 0	,,	11 5 0
,, 2nd and 3rd	7 15 0	,,	9 0 0
New Brunswick	7 0 0	,,	8 10 0
Riga	9 5 0	,,	10 5 0
St. Petersburg	10 10 0	,,	17 0 0
Swedish	10 10 0	,,	17 10 0
Finland	9 10 0	,,	11 0 0
White Sea	12 5 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 10 6	,,	£0 15 0
2nd ditto	0 9 6	,,	0 10 9
Other qualities	0 4 6	,,	0 9 9
Staves, per standard M:—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£23 0 0	to	£23 5 0
Rapeseed, English pale	,, ...	25 5 0	,,	25 15 0
Do., brown	,, ...	24 0 0	,,	24 5 0
Cottonseed, refined	,, ...	19 10 0	,,	20 10 0
Olive, Spanish	,, ...	33 0 0	,,	33 10 0
Seal, pale	,, ...	18 10 0	,,	19 0 0
Cocoanut, Cochin	,, ...	29 5 0	,,	29 10 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	23 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

LIST OF COMPETITIONS OPEN.

Elland—Baths on South House Estate	No first; £20, £10	The Clerk, U.D. Council Offices, Elland	Oct. 28
Horley—Fire-Engine Station	£10	Robert L. Love, Solicitor, Clerk to Parish Council, Horley, Surrey	Nov. 1
St. Agnes—Water Scheme for Supplying Wheal Rose, Skinner's Bottom, and Blackwater from Mevagissey Watering	£25 (merged)	John Angwin, Clerk, St. Agnes, Cornwall	„ 30
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	„ 30
Bury, Lancs—Infectious Diseases Hospital, Bolton-road (limit £12,500; Assessor)	£100, £50, £25	The Borough Engineer, Corporation Offices, Bank-street, Bury	Dec. 1
Ilford—Church (limit £4,000)	£20, £15, £10	J. Lamb, 20, Belmont-road, Ilford, Essex	„ 12
Lymm—Council Offices, Whitbarrow-lane (£2,800)	£25 (merged), £15	W. Mullard, Clerk, Council Offices, Lymm	„ 15
Leicester—Workhouse Infirmary (360 patients) and Imbeciles' Home (150 patients)	£100, £50, £25	The Clerk to Board of Guardians, Leicester	—

LIST OF TENDERS OPEN.

BUILDINGS.

Tonypandy—Extending Gwalia Restaurant	Wm. Howells	Griffiths and Jones, MM.S.A., Excelsior Buildings, Tonypandy	Oct. 28
Abergwynfi—Alterations of Two Cottages	Conservative Club	Ll. Davies, Architect, Victoria Buildings, Neath	„ 28
Kennethmont—Workmen's Houses, Ardmore Distillery		Charles C. Doig, Architect, Elgin	„ 28
Blackburn—Nurses' Home	Nursing Association	Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	„ 28
Tantobie—Two Houses	Lown and Williamson	H. Moyle, Architect, Hobson	„ 28
Oswestry—Reroofing Gymnasium, Victoria-street		G. W. Lacey, C.E., Borough Surveyor, Guildhall, Oswestry	„ 28
Buxton—Cottage, Burbage Reservoir	Urban District Council	Josiah Taylor, Clerk, Buxton	„ 28
Llandogo—Alterations to House and Lodge	Henry de la Pasture	E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	„ 28
Harrow, W.—Manufacturing Premises		Owen P. Parsons, Architect, 14, Temple-street, Birmingham	„ 28
Penygraig—Additions and Alterations to Gethin Hotel	Rhondda Valleys Brewery Co.	Griffiths & Jones, M.M.S.A., Archts., Excelsior Bldings., Tonypandy	„ 28
Leixlip—Four Labourers' Cottages	Celbridge Rural District Council	The Architect, 33, Kildare-street, Dublin	„ 28
Edinburgh—Repairing Dwelling-Houses, &c., on the Estate of Burnhouse and Camps	Corporation	The City Architect, Edinburgh	„ 28
North Broomhill—Miners' Club		J. McCloud, Store-row, North Broomhill, Acklington	„ 28
Canterbury—Six Cottages, Sturry-road	Town Council	The City Surveyor, Tudor Chambers, Canterbury	„ 28
Northallerton—Cottage	Urban District Council	W. Fowle, Clerk, Northallerton	„ 28
Kanturk—Additions to Old School		P. Horgan, Percival-street, Kanturk	„ 30
Carlisle—Two Houses, Currock-road	A. Holden	W. Pogson, Architect, Devonshire-street, Carlisle	„ 30
Shipley—Detached House		Samuel Jackson and Son, Architects, Tanfield Chambers, Bradford	„ 30
Southwold—Timber Work Cliff Protection Marine Villa	Charles Foster	F. Ball, Borough Surveyor, 8, Chester-road, Southwold	„ 30
Leeds—Rebuilding Premises, Land's-lane	Mallorie and Co.	T. Winn, Architect, 92, Albion-street, Leeds	„ 30
Halifax—Foundries, &c.		Jackson and Fox, Architects, Rawson-street, Halifax	„ 30
Bare—Three Houses and One Shop on Victoria Esplanade	J. C. Turner	Albert Gorton, Architect, 24, The Crescent, Morecambe	„ 31
Sandown—Higher Grade Board School	Brading School Board	James Newman, Architect, Thornton, Sandown	„ 31
Barry—Additions to Intermediate School	Glamorgan County Council	T. Mansel Franklen, Clerk, Westgate-street, Cardiff	„ 31
Grantown—Villa		James Gilbert, The Square, Grantown	„ 31
Amesbury—Additions to Sick Wards, Workhouse	Guardians	John Harding and Son, Architects, 58, High-street, Salisbury	„ 31
Seaton—Dwelling House	Whitfield Foster	Donald and Tate, Architects, 14, John-street, Workington	„ 31
Fletton Rural—Schools (600)	School Board	Wm. Boyer, Architect, 10A, Cowgate, Peterborough	„ 31
Seaton—Two Cottages	John Pattinson	Donald and Tate, Architects, 14, John-street, Workington	„ 31
Dublin—Twenty-Four Labourers' Cottages in Rathfarnham, and Twenty-Four in Clondalkin Electoral Divisions	South Dublin R.D.C.	Thomas Phelan, Clerk, Board Room, James's-street, Dublin	Nov. 1
Myton-on-Swale—School		W. Ward, Myton Hall, Helperby	„ 1
Gayton—Alterations to Workhouse	Guardians	Herbert T. Tilson, Architect, Railway-road, King's Lynn	„ 1
Seaton—Two Cottages	Francis Corrie	Donald and Tate, Architects, 14, John-street, Workington	„ 1
Mallow—Repairs to Cottages, Sinking Wells, &c.	Rural District Council	M. Regan, Clerk, Mallow	„ 1
St. Budeaux—House and Stables	Dr. Festing-Smith	Burgess Foster, Architect, 6, James-street, Plymouth	„ 1
London, E.C.—Locomotive Shed	East Indian Railway Co.	A. P. Dunstan, Secretary, Nicholas-lane, London, E.C.	„ 1
Halifax—Primitive Methodist Chapel, St. Thomas-street		Medley Hall, Architect and Surveyor, 29, Northgate, Halifax	„ 2
Alresford—Additions to Workhouse	Guardians	W. H. Hunt, Architect, Alresford, Hants	„ 2
Crossgate—House, Austhorpe-lanes	A. Stephenson	C. Fredk. Wilkinson, Architect, 35, Park-square, Leeds	„ 2
Drogheda—Repairs to Workhouse	Guardians	J. Turley, Architect, Drogheda	„ 2
Upper Holloway, N.—Chimney Shaft (160ft.) at Workhouse	St. Mary, Islington, Guardians	Wm. Smith, Architect, 65, Chancery-lane, W.C.	„ 2
Brecon—Intermediate Schools		J. H. Phillips, Cardiff, and F. Baldwin, Brecon, Joint Architects	„ 2
Alresford—Additions to the Workhouse	Guardians	W. H. Hunt, Architect, Alresford, Hants	„ 2
Banff, N.B.—Coastguard Buildings	Admiralty	The Coastguard Station, Banff, N.B.	„ 3
Hessle—Committee-Room at Cottage Homes	Guardians of Sculcoates Union	T. Beecroft Atkinson, Architect, 11, Trinity House-lane, Hull	„ 3
Dewsbury—Branch Store and House at West-town	Industrial Society	Holtom and Fox, Architects, Westgate, Dewsbury	„ 3
Padstow—Coastguard Buildings	Admiralty	The Coastguard Station, Padstow	„ 3
Bicester—New Floors in National Schools		Charles W. Brabant, Hon. Secretary, South View, Bicester	„ 4
Rushall—Additions to Boys' School	School Board	Hickton and Farmer, Architects, Bridge-street, Walsall	„ 4
Hesket—Additions and Alterations at School		The Rev. J. A. Scott, Vicarage, Hesket, near Carlisle	„ 4
Cork—Repairs to Labourers' Cottages	District Council	John Cotter, Clerk, Board Room, Workhouse, Cork	„ 4
Stafford—Additions, &c., to County Technical Buildings	County Council	H. T. Hare, F.R.I.B.A., 13, Hart-street, Bloomsbury-square, W.C.	„ 4
Dundrum—Steam Laundry Buildings, &c., at Central Criminal Lunatic Asylum		The Office of Public Works, Dublin	„ 6
Oldham—Public Baths at Lowermoor	Market and Baths Committee	S. A. Pickering, A.M.I.C.E., Borough Surveyor, Town Hall, Oldham	„ 6
Douglas, I.M.—Completion of Enlargement of Head Post Office	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	„ 7
Amesbury—Wesleyan Chapel		Moody and Sons, Fisherton-street, Salisbury	„ 7
Walthamstow—Blackhorse-road School (1,500)	School Board	W. Longmore, F.R.I.B.A., Bridge Chmbs., Hoe-st., Walthamstow	„ 7
Erdington—Airing-Shed and Improvements at Workhouse	Guardians of Aston Union	C. Whitwell, Architect, 23, Temple-row, Birmingham	„ 7
Cardiff—Rebuilding Premises, High-street		E. M. Bruce Vaughan, F.R.I.B.A., Cardiff	„ 7
Enfield—Alterations and Additions to Alma-road School	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	„ 7
West Brompton—Additions to Infirmary, Fulham-road	St. George's Union Guardians	E. T. Hall, F.R.I.B.A., Architect, 57, Moorgate-street, E.C.	„ 7
Truro—Alterations to Royal Cornwall Infirmary		Charles Cole, Architect, 50, High-street, Exeter	„ 7
Cymmer—Terrace of Seven Houses		Arthur O. Evans, Architect, Pontypridd	„ 8
Waunllwyd—Forty Houses	Joseph Light, Ebbw Vale	Swalwell & Creighton, Archts., Steam Packet Chmbrs., Newprt, Mon.	„ 8
Llandovery—New School, Wings, and Alterations to College		Austin and Paley, Architects, Castle Park, Lancaster	„ 8
Victoria, Mon—Forty Houses		Swalwell and Creighton, A.R.I.B.A., Dock-street, Newport, Mon.	„ 8
Hastings—Fireproof Floor to Workhouse	Guardians	Jeffery and Skiller, Architects, 5, Havelock-road, Hastings	„ 9
Westbury-on-Severn—Tramp Wards	Guardians	W. Fitzgerald Jones, 21, George-street, Gloucester	„ 13
Leicester—Wholesale Market in Halford-street	Corporation	Walter Brand, A.R.I.B.A., 16, Bishop-street, Leicester	„ 13
Battersea—Two Houses at Heathwell Pumping Station	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	„ 14
Woolwich—Public Library, William-street	Board of Health	Church, Quick, and Whincop, Architects, William-st., Woolwich	„ 14
Exeter—Offices at St. David's Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	„ 14
Bath—Forty Dwellings for Labouring Classes in Dolemeads	Urban Sanitary Authority	Charles R. Fortune, City Surveyor, Guildhall, Bath	„ 14
Rhyl—School Buildings	Governors of County Schools	Frank H. Shaylor, Architect, Belvoir House, Shrewsbury	„ 15
Southampton—Workhouse Infirmary, Shirley Warren	Guardians	W. H. Mitchell, Son, and Guttridge, Architects, Southampton	„ 20
Cricklade—County Police-Station	Wilts Standing Joint Committee	Charles S. Adye, County Surveyor, County Offices, Trowbridge	„ 22
Swindon—Hospital Buildings	Swindon & District Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	Dec. 2
Isle of Walney—Two Hundred Workmen's Dwellings	Vicars, Sons, and Martin	The Isle of Walney Estates Co., Ltd., Walney	—
Poole—Two Cottages, Stable, Coach-House, &c.		F. Butler, Carriage Works, Poole	—
Northbourne—Repairs to Church		The Rector or Churchwardens, Northbourne, Deal	—
Stockton—Rebuilding 71, High-street	S. S. Eades	T. W. T. Richardson, Architect, 57, High-street, Stockton	—
Ashton-under-Lyne—Houses (17 to 40)		Samuel Lomas, 5, Stockport-road, Ashton-under-Lyne	—
Prestatyn—Villa		Burton & Percival, Archts., 150A, Stamford-st., Ashton-u.-Lyne	—
Barry—New Buildings off Park-crescent	W. J. Rogers, Ltd.	J. P. Jones, Richards, and Budgen, Archts, 18, St. Mary-st., Cardiff	—
Rawtenstall—House, Warehouse, and Stable at Holme Bank		John Taylor, 6, Ormerod-street, Rawtenstall, Lancs	—
Bexley Heath—Six Tenement Houses		Hawkins & Edgecombe, Architects, 22, Henrietta-st., Covent Garden	—
Lochmaddy—School and Teachers' House at Kylis Flodda	South Uist School Board	A. MacElfrish, Clerk, Lochmaddy	—
East Ham—Congregational Church		J. D. and S. J. Mould, Architects, 53, Queen Victoria-street, E.C.	—
Utley—Additions to the Roebuck Inn		John Judson and Moore, Architects, York Chambers, Keighley	—
Consett—Two Engine Houses	Iron Co., Ltd.	The Engineer's Office, Consett, Durham	—
Lulworth—Restoring Buttresses of East Lulworth Tower		The Rev. R. Usher, East Lulworth Vicarage, Wareham	—
Blackburn—Steam Laundry		Stones and Stones, Architects, 10, Richmond-terrace, Blackburn	—
Leigh—Warehouse at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Wombwell—Chimney (40 yards) at Main Colliery		The Colliery Offices, Wombwell, Yorks	—
Leeds—Warehouse		W. Rusby, 25-27, Meadow-lane, Leeds	—
Buxton—Two Detached Villas	B. Wardle	Garlick and Flint, Architects, Terrace-road, Buxton	—
Ulverston—Bank, County-square		Settle and Farmer, Architects, Ulverston	—

BUILDINGS—*continued.*

Castleford—Six Houses, Ambler-street		Garside and Pennington, Architects, Central Chambers, Castleford	—
Warsaw—Freezing-Chambers, &c., in Market Halls	Municipality	The Commercial Dept. of the Foreign Office, Whitehall, S.W.	—
Great Yarmouth—Engineer's Shops, Foundry, and Stores		Crabtree and Co., Engineers, Great Yarmouth	—
Preesall—House		John Lawrenson, 41, London-street, Fleetwood	—
Leeds—Frame Schoolhouse, Cardigan-road	St. Margaret's Church Trustees	Corson and Jones, Architects, 25, Cook-street, Leeds	—
Rothbury—Houses		Thomas Muckle, Rothbury	—
Carlisle—Converting 30, Lowther-street, into Business Premises	Clark Bros. and Co.	T. Taylor Scott, F.R.I.B.A., 45, Lowther-street, Carlisle	—
Ilford—Congregational Church		J. D. and S. J. Mould, Architects, 52, Queen Victoria-street, E.C.	—
Broughton-in-Furness—Washhouses and W.C.'s at Cinder Hill		John Clark, Solicitor, Broughton	—
Leeds—Business Premises and Manager's House, Claypit-lane	Henry Clarkson	Butler, Wilson, and Oglesby, Architects, 12, East Parade, Leeds	—
Richmond—Fifty Houses		J. Pennington, F.A.I., Surveyor, Richmond	—
Abergavenny—Additions to National Schools, Hereford-road		E. A. Johnson, F.R.I.B.A., Abergavenny	—
Gorton—Extensions to Stables	Urban District Council	The Council Office, Hyde-road, Gorton	—
Tottenham—Six-Roomed Houses in Bruce-grove		S. Ford, A.R.I.B.A., F.S.I., Archt., 3, South-sq., Gray's Inn, W.C.	—
Ballyclare—Rebuilding Dye-House, &c.		The Whitepark Finishing Company, Ballyclare	—
Radyr—Wesleyan Chapel	Chapel Trustees	J. P. Jones, Richards, and Budgen, Archts., St. Mary-street, Cardiff	—
Easington—Cottages		The Easington Coal Company, Limited, Sunderland	—
Clowne—Sixty Houses		Frank Cook, Architect, 22, Leeming-street, Mansfield	—
Stafford—Alteration to Premises in Lichfield-road	Laundry Co.	J. Goodchild, Hazeldene, Stafford	—
Bradford—Alteration to Premises, All Saints'-road		G. C. Ross, Architect, Morley-street, Bradford	—
Morecambe—Concert Hall, West End Market		H. Howarth, Architect, 7, Regent-road, Morecambe, W.	—
Barrow—Alterations to Albion Hotel	Henry Spencer and Co.	E. M. Young, Architect, 90, Duke-street, Barrow	—
Earl's Barton—Games Rooms, &c., at Institute		Mosley & Anderson, Architects, Fish-st., Northampton	—
Tottenham—Work in Woodlands Park and Alexandra Schools	School Board	G. E. T. Laurence, Architect, 181, Queen Victoria-street, E.C.	—
Ilkley—Additions to Property in The Grove		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—
Burnley—Brick Warehouse, Park Horse-yard	Misses Harker	G. B. Rawcliffe, Architect, 5, Nicholas-street, Burnley	—
Shirebrook—Nave and Aisle to Holy Trinity Church		Hedley J. Price, A.R.I.B.A., 24, Low-pavement, Nottingham	—
Castleton—New Works	David Bridge and Co.	T. Townsend, jun., Architect, District Bank Chambers, Rochdale	—
Hamilton—District Offices		Alexander Cullen, F.R.I.B.A., Brandon Chambers, Hamilton	—
Dundrum—Business Premises	J. M'Clafferty	J. J. M'Donnell, M.R.I.A.I., 27, Chichester-street, Belfast	—
Shipley—Club Premises		J. Jackson, M.S.A., Architect, Barry-street, Bradford	—
Ashton-under-Lyne—Shops in Warrington-street and Additions to George and Dragon Hotel	Gartsides, Limited	J. Eaton, Sons, & Cantrell, Archts., Bank Bldngs., Ashton-under-Lyne	—
Horwich—Four Houses and Shop Premises		Ernest W. Dyson, Architect, 17, Lee-lane, Horwich	—
Colne—Technical Schools and Library	Corporation	Woodhouse and Willoughby, 100, King-street, Manchester	—
Leeds—Baptist Chapel, Beeston Hill		W. A. Hobson, Architect, 82, Albion-street, Leeds	—
Kidderminster—Addition to Carpet Manufactory	Carpet Manufacturing Co.	Gething and Son, Architects, Oxford Chambers, Kidderminster	—
Droylsden—Additions to St. Mary's Church Schools		J. Eaton, Sons, & Cantrell, Archts., Bank Bldgs., Ashton-under-L.	—
Hurst—Colliers' Arms Inn, Hillgate-street	Walker and Homfray, Ltd.	Eaton, Sons, & Cantrell, Archts., Bank Bldgs, Ashton-under-Lyne.	—
Keighley—Working Men's Club, Calversyke		G. H. Knowles, Architect, Burlington Chambers, Keighley	—
Stockfield-on-Tyne—Schools	Bromley & Bywell (U.D.) School B.	J. Wm. Rounthwaite, 13, Mosley-street, Newcastle-on-Tyne	—
Gosforth—Superintendent's Residence at Lunatic Asylum		John W. Dyson, 67, Grey-street, Newcastle	—
Hucknall Torkard—Alterations to Beardall-street School	School Board	A. N. Bromley, Architect, Prudential Buildings, Nottingham	—

ENGINEERING.

Totnes—Culvert at Dean Prior	Rural District Council	Charles Ellis, Highway Surveyor, Buckfastleigh	Oct. 28
Midleton—Deepening Pump	Rural District Council	Wm. Roche, Clerk, Midleton	„ 28
Cardiff—Tubular Tank at Workhouse	Guardians	A. J. Harris, Clerk, Union Offices, Cardiff	„ 28
Dartmouth—Laying Stoneware Pipes	Urban District Council	J. H. Wallis, Water Inspector, 1, Victoria-road, Dartmouth	„ 28
Bicester—Sinking Well, &c.	Urban District Council	E. F. Tanner, Clerk, Market Hill, Bicester	„ 28
Stonehaven—Harbour Extension	Harbour Trustees	Jas. Barron, M.I.C.E., 1, Bon Accord-street, Aberdeen	„ 30
Port Elizabeth to Humansdorp, Capetown—Railway (70 miles)		The General Manager of Railways, Capetown	„ 30
Birkenhead—Cooking Apparatus at Workhouse at Tranmere	Guardians	E. Kirby, Architect, 5, Cook-street, Liverpool	„ 30
Aylesbury—Machinery at Sewage Disposal Works	Urban District Council	J. H. Bradford, Surveyor, 2, Rickford's Hill, Aylesbury	„ 30
Chipping Campden—Waterworks	Rural District Council	Nicholson Lailey, A.M.I.C.E., 16, George-street, Westminster	„ 31
Whickham, Durham—Reconstruction of the Keelman's Bridge, Swalwell	Urban District Council	John McGregor, 71, Spoor-street, Dunston	Nov. 1
Upper Holloway, N.—Boiler and Flues, &c., at St. John's-road Workhouse	St. Mary, Islington, Guardians	Wm. Smith, Architect, 65, Chancery-lane, W.C.	„ 2
Castle Donington—Extension of Water Mains	Rural District Council	G. and F. W. Hodson, Engineers, Loughborough	„ 2
Lytham—Pipe Laying	Urban District Council	H. Bancroft, Civil Engineer, 88, Mosley-street, Manchester	„ 2
Northfield—Sinking Bore Hole	Guardians of King's Norton Union	E. Docker, Clerk, King's Norton	„ 2
Sydney, New South Wales—Refuse Destructor, &c.	Municipal Council	Jno. R. Palmer, Town Clerk, Sydney	„ 2
Faversham—Sinking Well	Water Co.	Baldwin Latham, M.I.C.E., 13, Victoria-street, Westminster	„ 3
Worcester—Covering Pure-Water Tank at Waterworks	Corporation	Thomas Caink, A.M.I.C.E., City Engineer, Guildhall, Worcester	„ 4
Llandudno—Dynamos, &c.	Urban District Council	Preece and Cardew, 13, Queen Anne's-gate, Westminster, S.W.	„ 6
Maidstone—Electric-Lighting Plant	Corporation	Stevens and Barker, Engineers, St. Peter-street, Maidstone	„ 6
Wrexham—Boiler and Engine House Plant	Town Council	W. H. Trentham, 39, Victoria-street, Westminster, S.W.	„ 6
East Retford—Machinery, &c., for Lifting Sewage	Corporation	J. C. Melliss, M.I.C.E., 264, Gresham House, Old Broad-st., E.C.	„ 8
Warrington—Covered Concrete Service Reservoir (4,000,000gal.)	Corporation	James Deas, C.E., M.I.M.E., Bank House, Warrington	„ 10
Latheronwheel—Concrete Breakwater	Caithness County Council	James Fraser, Civil Engineer, Inverness	„ 11
Croydon—Electric Lighting at Workhouse, Infirmary, and Union Offices	Guardians	A. W. Sclater, A.M.I.C.E., 182, Oxford-street, W.	„ 11
London, E.C.—Engines, Tires, &c.	Burma Railways Co.	The Company's Offices, 78, Gresham House, Old Broad-st., E.C.	„ 13
Llandudno—Extension of Outfall	Urban District Council	E. Paley Stephenson, A.M.I.C.E., Llandudno	„ 13
Birkenhead—Electric Motor-Cars	Corporation	C. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	„ 13
Beckton, E.—Overhead Traveller, Outfall Works	London County Council	The Engineer's Department, County Hall, Spring Gardens, S.W.	„ 14
Port Dundas—Two 800H.P. Auxiliary Engines	Glasgow Corporation	John Young, General Manager, 88, Renfield-street, Glasgow	„ 14
Clacton-on-Sea—Cast-Iron Main (7½ miles of 11in.)	Urban District Council	J. Taylor, Sons, & Santo Crimp, C.E., Gt. George-st., Westminster	„ 14
Blackburn—Six-Cell Destructor, Daisyfield		William Stubbs, Borough Engineer, Blackburn	„ 15
Hoylake—Electric Lighting Plant	Urban District Council	T. L. Miller, M.I.E.E., 7, Tower Buildings N., Water-st., Liverpool	„ 15
Bodmin—Water Supply Works, Bridgend, St. Winnow	Rural District Council	William J. Jenkins, M.S.A., Surveyor, Bodmin	„ 15
Leeds—Water Main (11 miles 1,170 yards of 30in.)	Corporation	T. Hewson, M.I.C.E., Waterworks Engr., Municipal Bldngs., Leeds	„ 15
Frodsham—Waterworks	Rural District Council	G. F. Ashton, Clerk, 71, High-street, Runcorn	„ 17
Middlesbrough—Condensing Plant, &c.	Electric Lighting Committee	R. Hammond, M.I.C.E., 64, Victoria-street, Westminster, S.W.	„ 17
Panama—Aqueduct		Her Majesty's Consul at Panama	„ 22
Porto Alegre—Electric Lighting	Municipality of Porto Alegre	The Commercial Department of the Foreign Office, Whitehall, S.W.	Dec. 30
Kurunegala to Kankasanturai, Ceylon—Railway (200 miles)	Ceylon Government	The Colonial Secretary, Colombo	„ 31
Ilford—Portable Steel Crane (3-ton)	Gas Co.	The Engineer's Office, Gasworks, Ilford	Jan. 4
Uddington—Electric Lighting Plant		J. Watson, Builder, Uddinston, Scotland	—
Stepney—Cooking and Heating Apparatus, Ratcliffe Workhouse	Guardians	R. Banks Martin, Architect, 103, Plashet-grove, East Ham	—
Chetwynd Aston—Waterworks	Newport Rural District Council	W. Wyatt, Engineer, Bryndwr, All Saints, Shrewsbury	—
Morecambe—Electric Lighting Extensions	Urban District Council	C. F. Parkinson, M.I.E.E., Wood Hill-lane, Morecambe	—
Warrington—Air Compressors	Sanitary Works Committee	The Sanitary Engineer's Office, Bank House, Warrington	—
Earl's Barton—Storage Tank	Wellingborough R.D.C.	Sharman and Archer, Wellingborough	—
St. Pancras—Temporary Generating Plant	Vestry	C. H. F. Barrett, Vestry Clerk, Vestry Hall, Pancras-road, N.W.	—

FENCING AND WALLS.

Londonderry—Walls and Gate Piers at Brook Park	Brook Trustees	M. A. Robinson, M.R.I.A.I., Richmond-street, Londonderry	Oct. 30
Macclesfield—Oak Park Pale-Fence at the Paddock to Westbank House	Cemetery Committee	Edward E. Adshead, Borough Engineer, Town Hall, Macclesfield	Nov. 1
Bargoed, Wales—Retaining Walls, Basement, and Drainage	Hanbury Arms Hotel	D. J. Lougher, Architect, Bank Chambers, Pontypool	„ 1
Blaydon-on-Tyne—Creosoted Military Fencing (900 lineal yards)	Urban District Council	G. Symon, Council Offices, Blaydon	„ 2
Westminster—Retaining Walls and Foundations for Public Offices, Parliament-street	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, Storey's Gate, S.W.	„ 15
Great Berkhampstead—Boundary Wall, Lower King's-road	Urban District Council	Edward H. Adey, Surveyor, Shrublands-terrace, Berkhampstead	—

FURNITURE AND FITTINGS.

Cockermouth—Twelve Iron Bedsteads	Guardians	J. H. Musgrave, Clerk, Cockermouth	Oct. 28
Highgate Hill, N.—700 Bedsteads at Infirmary	Guardians of St. Mary, Islington	The Guardians' Offices, St. John's-road, Upper Holloway, N.	Nov. 1
Swansea—Bookcases, Tables, &c., at Bellevue House, Mount Pleasant	Governors	L. Collwyn Lewis, Secretary, Grammar School, Swansea	„ 6
Manchester—Pipes, Porcelain Baths, and Fittings at the Leaf-street Baths	Baths Committee	The City Surveyor, Town Hall, Manchester	„ 15

PAINTING.

Easingwold—Primitive Methodist Chapel and School	Trustees	The Rev. R. Ainsworth, Easingwold, Yorks	Oct. 28
Edinburgh—M'Donald-road Electric Lighting Station	Magistrates and Council	The Burgh Engineer, 1, Parliament-square, Edinburgh	„ 30
Burnley—Interior of Union Offices	Guardians	J. S. Horn, Clerk, Union Offices, Burnley	Nov. 1
Bermondsey, S.E.—Town Hall, Board-Room, Offices, &c.	Vestry	Fredk. Ryall, Vestry Clerk, Town Hall, Bermondsey	„ 6
Greenhithe—Seven Shops		G. W. Cobham, Surveyor, 1, Edwin-street, Gravesend	—

PLUMBING AND GLAZING.

Hurst—Plumbing, &c., Colliers' Arms Inn, Hillgate-street		J. Eaton, Sons, and Cantrell, Bank Chambers, Ashton-under-Lyne	—

ROADS AND STREETS.

Emsworth—Paving, &c., Station-road	Warblington U.D.C.	Frank Swinburne, Surveyor, West-street, Emsworth	Oct. 28
Bath—Completing Kingshill-road, Upper Knowle		Spackman and Son, 6, Terrace-walk, Bath	„ 28
Omagh—Road Maintenance	Rural District Council	William Cathcart, Clerk, Omagh	„ 28
East Grinstead—Making-up Charlwood-row, Durkins-road, and Wellington Town-road	Urban District Council	R. Wilds, Surveyor, Council's Offices, East Grinstead	„ 30
Coventry—Completing Upper York-street	Corporation	J. Swindlehurst, City Engineer, Coventry	„ 30
Shipley—Paving, &c., Regent-street	Urban District Council	Jno. S. Rhodes, Clerk, Manor House, Shipley	„ 30
York—Street Works	Corporation	Alfred Creer, City Engineer, Guildhall, York	„ 30
Altofts, Yorks—Kerbing, &c., Church-road	Urban District Council	W. Wilkinson, Surveyor, District Council's Office, Altofts	„ 31
Silloth, Cumberland—Flagging, &c.	Holme Cultram U.D.C.	George Armstrong, Architect, 24, Bank-street, Carlisle	„ 31
Hove—Roadmaking in Carlisle-road		H. H. Scott, Borough Surveyor, Town Hall, Hove	Nov. 1
Castleford—Improvement Works, Bridge-street	Urban District Council	W. Green, Surveyor, Castleford	„ 2
Cromer—Making-up Cabbel-road and Cadogan-road (East)	Urban District Council	A. F. Scott, Surveyor, Church-street, Cromer	„ 3
Hessle—Kerbing and Channelling Roadways	Guardians	T. Beecroft Atkinson, Architect, 11, Trinity House-lane, Hull	„ 3
Eastbourne—Paving Thirteen Roads	Highways Committee	R. M. Gloyne, A.M.I.C.E., Boro' Engineer, Town Hall, Eastbourne	„ 4
Alverstoke—Forming Paths, Ann's Hill-road	Burial Board	H. A. F. Smith, Surveyor, High-street, Gosport	„ 6
Erith—Street Works, Manor-road	Urban District Council	The Surveyor, High-street, Erith	„ 6
Camberley—Levelling, &c., Two Private Streets	Urban District Council	W. J. Hodgson, Surveyor, High-street, Camberley	„ 7
Frimley—Improvements at Frimley Green	Urban District Council	W. J. Hodgson, High-street, Camberley	„ 7
Old Hill—Forming, &c., Clifton-street	Urban District Council	Daniel Wright, Clerk, Lawrence-lane, Old Hill	„ 8
Southampton—Asphalting French-street	Corporation	W. B. G. Bennett, Boro' Engineer, Municipal Offices, Southampton	„ 14
Armley—Flagging Sixteen Houses near Carr Crofts		B. Anderson, Prospect House, Littlemoor-road, Pudsey	—
London, E.C.—Concreting (17,000 yards)		P. K., c/o Street and Co., 30, Cornhill, E.C.	—
Norden, Lancs—Kerbing, &c., Clapgate-road	Urban District Council	J. W. Sunderland, Surveyor, Church View, Norden	—

SANITARY.

Frimley—Sewering Frimley-road	Urban District Council	W. J. Hodgson, Surveyor, High-street, Camberley	Oct. 30
Keighley—Sewering, Paving, &c.	Corporation	W. H. Hopkinson, A.M.I.C.E., Borough Engineer, Keighley	„ 31
Whickham, Durham—Two Public Conveniences	Urban District Council	John McGregor, 71, Spoor-street, Dunston	Nov. 1
Felling—Laying Drain at Bill Quay	Urban District Council	H. Miller, C.E., Surveyor, Council Offices, Felling	„ 1
Ware—Sewage Carriers at Rye House Sewage Farm	Urban District Council	J. Goddard, Surveyor, New-road, Ware	„ 1
Deal—Underground Lavatory, Beach-street	Urban District Council	The Borough Surveyor's Office, 23, Queen-street, Deal	„ 2
Govan—Sewers, &c.	Joint Railway Committee	James Deas, Jun., C.E., 53, Bothwell-street,, Glasgow	„ 2
Deal—Additions to Broad-street Lavatory	Urban District Council	The Borough Surveyor's Office, 23, Queen-street, Deal	„ 2
Cricklade—Sewage Disposal Works	Rural District Council	N. J. Cuss, Engineer, Cricklade	„ 4
Edinburgh—Underground Convenience at St. Mary-street	Magistrates and Council	Thos. Hunter, W.S., Town Clerk, City Chambers, Edinburgh	„ 4
Walsall—Urinal in Pleck-road	Corporation	The Borough Surveyor, Bridge-street, Walsall	„ 6
Teddington—Sewer	Urban District Council	M. Hainsworth, Surveyor, Council Offices, Teddington	„ 6
Golder's Hill—Sewerage Works	Hendon Urban District Council	S. Slater Grimley, Engineer, Public Offices, Hendon, N.W.	„ 6
Frinton-on-Sea—Sewer at Victoria-terrace	Tendring Rural District Council	W. Golds, Surveyor, 9, Landermere-road, Thorpe-le-Soken	„ 6
Ryton-on-Tyne—Sewer at Clara Vale	Urban District Council	John P. Dalton, Engineer, Ryton	„ 8
Darton—Sewerage and Sewage Disposal Works	Urban District Council	W. H. Radford, C.E., Pelham Chambers, Angel-row, Nottingham	„ 10
Billericay—Sewers, &c. (6,000 yards)	Rural District Council	Bailey-Denton, Son, & Lawford, M.M.I.C.E., Bridge-st., Wstmnster	„ 11
Kingsclere—Drainage Works	Rural District Council	John Barnes, Clerk, Kingsclere	„ 11
Cuckfield—Sewers (12,150 yards)	Rural District Council	J. Mansergh, Engineer, 5, Victoria-street, Westminster	„ 15
Morecambe—Sewers, &c.	Urban District Council	Beesley, Son, and Nichols, 11, Victoria-st., Westminster, S.W.	„ 15
Concepcion—Drainage and Waterworks	Chilian Government	The Commercial Department of the Foreign Office, S.W.	Jan. 8
Homerton, N.E.—Lavatories, &c., at Perseverance Club		Thos. Jones, Secretary, 17 and 19, Church-road, Homerton, N.E.	—
Dartford—Main Sewer on Building Estate		C. E. Vaughan, F.R.I.B.A., 11, Adam-street, Strand, W.C.	—
Wilmslow—Sewers		John Bowden, A.M.I.C.E., 14, Ridgefield, Manchester	—
Wallingfen—Sewer	Howden Rural District Council	Henry Green, Clerk, Howden	—

STEEL AND IRON.

Lytham—Flanged Pipes (44 tons of 15in.)	Urban District Council	Henry Bancroft, Civil Engineer, 88, Mosley-street, Manchester	Oct. 28
Torquay—Cast-Iron Pipes (150 tons)	Water Committee	W. Ingham, A.M.I.C.E., Town Hall Chambers, Torquay	„ 30
Uphall Station—Double-Headed Steel Rails (2 miles)	Edinboro' District Lunacy Board	Andrew Ferrier, Clerk, Castle-terrace, Edinburgh	„ 31
India Office—Steel Tires	Secretary of State for India	The Director-General of Stores, India Office, Whitehall, S.W.	„ 31
Bethnal Green—Lamp Columns (100), Gully Gratings (100), and Manhole Covers (100)	Vestry of St. Matthew	F. W. Barratt, Surveyor, Vestry Hall, Church-row, Bethnal Green	Nov. 2
Edinburgh—Dry-Sand Cast-Iron Pipes (920 tons)	Edinboro' & District Water Trustees	J. and A. Leslie and Reid, C.E., 72A, George-street, Edinburgh	„ 6
Clacton-on-Sea—Cast-Iron Socket and Spigot Pipes (50 tons)	Urban District Council	Sydney Francis, Engineer, Town Hall Buildings, Clacton-on-Sea	„ 6
Glasgow—Cast-Iron Pipes (10 miles of 2in.)	Corporation	Sir James Marwick, Town Clerk, City Chambers, Glasgow	„ 20
Leigh—Steel Girders at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Cambridge—Cast-Iron Socket Gas-Mains (1,100 yards)		Rowe and Scott, C.E., Park House Cambridge	—
Leigh—Cast-Iron Columns at Albion Ironworks	Harrison, M'Gregor, and Co.	J. C. Prestwich, Architect, Leigh	—
Castleton—Cast-Iron Work, Steel Girders, &c.	David Bridge and Co.	T. Townsend, jun., Architect, District Bank Chambers, Rochdale	—

STORES.

Witham—Granite (500 tons)	Urban District Council	Bindon Blood, Clerk, Witham	Oct. 28
Wigan—Lime for Making Mortar (One Year)		J. J. Charnock, Town Clerk, Wigan	„ 28
Rochester—Fireclay Retorts, Firebricks, and Clay	Rochestr, Chatham, & Strood Gas Co.	J. M. Veevers, Engineer and Secretary, Gas Offices, Rochester	„ 30
Glasgow—Bricks, Fireclay, Sewage Pipes, &c.	Glasgow & South-Western Ry. Co.	F. H. Gillie, Secretary, St. Enoch Station, Glasgow	„ 30
London, E.C.—Steel, Bar Iron, Copper Pipes, Paints, &c.	Madras Railway Company	Julian Byrne, Secretary, 61, New Broad-street, E.C.	„ 31
Alvaston—Broken Granite (Six Months)	Urban District Council	Edwin Wildsmith, Clerk, Council Office, Alvaston	Nov. 1
Sheffield—Fireclay Goods (One Year)	Sheffield United Gaslight Co.	J. W. Morrison, Commercial-street, Sheffield	„ 1
Barnet—Road Materials, &c. (One Year)	Urban District Council	H. York, C.E., Surveyor, Station-road, New Barnet	„ 2
Deansgrange, Ireland—Sea-Gravel for Walks (100 tons)	Deansgrange Joint Burial Board	W. Burnell, Deansgrange Cemetery, Monkstown, Co. Dublin	„ 3
Sheffield—Fireclay Goods (One Year)	United Gaslight Co.	Hanbury Thomas, General Manager, Commercial-street, Sheffield	„ 4
Manchester—Granite Setts (10,000 tons)	Tramways Committee	J. M. M'Elroy, Sec., Tramways Department, Town Hall, Manchester	„ 4
Teddington—Broken Granite (1,000 cubic yards)	Urban District Council	M. Hainsworth, Surveyor, Council Offices, Teddington	„ 6
Armagh—Road Materials	Urban District Council	J. C. Boyle, C.E., Town Surveyor, Charlemont-place, Armagh	„ 6
Teddington—Kentish Pit Flints (2,000 cubic yards)	Urban District Council	M. Hainsworth, Surveyor, Council Offices, Teddington	„ 6
Birmingham—Iron and Steel Ware, Bricks, Lime, Cement, and Earthenware Drain Pipes, &c. (One Year)	Water Committee	The Foreman's Office, Brasshouse-passage, Broad-st., Birmingham	„ 10
Tynemouth—Flags (1,500sq.yd.) and Granite (1,500sq.yd.)	Corporation	John F. Smillie, Borough Surveyor, Tynemouth	—
Paisley—Glass (3,600sq.ft.) and Tarred Felt (10,800sq.ft.)		Paterson, Cooper, and Co., Thistle Works, Paisley	—
Tynemouth—Iron Slag (350 tons)	Corporation	John F. Smillie, Borough Surveyor, Tynemouth	—
Manchester—Glazed Earthenware Sewer Pipes, &c. (One Year)	Paving Committee	The City Surveyor's Department, Town Hall, Manchester	—
Oldham—Slate or Marble for Divisions to Public Baths		C. T. Taylor, A.R.I.B.A., 10, Clegg-street, Oldham	—

Trade News.

WAGES MOVEMENTS.

Bristol.—At a conference held on Friday night the dispute between the master builders and plasterers was amicably settled, and the men returned to work on Monday morning.

English Carpenters and Joiners and the Danish Lock-out.—The secretary of the Amalgamated Society of Carpenters and Joiners (Mr. F. Chandler, of Manchester) has sent to Mr. M'Donald, secretary of the London Trades Council, a cheque for £1,200 as the contribution of the society to the Danish lock-out trade unionists. The contribution is rather belated, but a correspondent understands that the ballot was only recently completed, and the money, having been voted, could not be used for any other purpose. The Danish Committee will use it to assist in the relief of any hard cases arising out of the lock-out.

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A group of new municipal buildings, Scottish Baronial in character, and faced with local stone, has this week been handed over free of all debt by the Balbirnie family to Markinch burgh.

CHIPS.

The New Union Infirmary, Farnham, Surrey, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke flues, and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Dr. Karl Lehmann, who during the last eighteen months has been engaged with Dr. Belck in Asia Minor, on an archæological expedition, in connection with Chaldean antiquities, has returned to Berlin. Dr. Belck is still at Tiflis.

During excavations in the rectory grounds at Merstham, two sun-baked Roman urns, containing ashes, have been unearthed, and in proximity were found several flint arrow-heads, a human tooth, and what appears to be a Roman coin. The latter is not decipherable.

The new town hall, free library, and fire station for Douglas, Isle of Man, were opened on Thursday in last week. The plot on which they stand in Ridgeway-street measures 132ft. by 118ft., front and side, the whole area being 1,080sq.yd. Thus it is not a large building considering its numerous uses. The cost has been about £12,500. There are three stories. The outer walls are of local stone, with Bath stone dressings.

A memorial pulpit executed by Messrs. Jones and Willis, of Birmingham, is about to be placed in the parish church of St. Lawrence, Ansley, near Nuneaton.

Memorial-stones of a Baptist school chapel were laid at New Fletton, near Peterborough, last week. The architect is Mr. W. Boyer, and the contractors are Messrs. Bridgefoot and Sons, all of Peterborough. The cost will be £2,150.

The Public Works Committee of the Argentine Chamber of Deputies has approved a proposal of Messrs. Runciman and Co., for the construction of defensive works at the entrance channel to the port of Buenos Ayres.

The Hon. Lyulph Stanley, vice-chairman of the London School Board, formally opened on Tuesday a new mixed school, which has been erected at Royal Hill, Greenwich, for the accommodation of 350 boys and girls, and 200 infants.

At a vestry meeting held at Acle last week it was decided to instruct Mr. H. J. Green, of Norwich, to report and prepare plans for the restoration of the parish church.

Operations have been commenced by the Great Western Railway Company in connection with the new line that is to be laid between Acton and High Wycombe.

THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LXXVII.—No. 2339.

FRIDAY, NOVEMBER 3, 1899.

PLUMSTEAD MUNICIPAL BUILDINGS AND LIBRARY.

LAST week we gave the result of the selection made by Mr. E. W. Mountford in the above competition for the proposed Municipal Buildings and Public Library at Plumstead, and described the main features of the three designs. We now are enabled to make a more detailed examination of the designs, especially of those placed in the first, second, and third places by the assessor. From a brief survey of the designs it will be observed the authors generally adopt three arrangements as regards the position of the public hall. A large number place the hall with its long axis east and west, as in the first selected design; others, including the second and third designs selected, place it at the Park-road end, with its axis north and south; and many place it in the centre of the site in the same direction. We are inclined to think the two former positions offer the greatest advantages for easy access and lighting—a view which the assessor has wisely adopted, and we believe the requirements of the London Building Act and the L.C.C. regulations are best fulfilled by these arrangements. Of these two positions we are inclined to think the second one has some advantages over the first. The hall is made a more prominent and distinct feature in the composition, and has two sides available for entrances and exits. One or other of these positions being settled, the author had to arrange his vestry offices either in the centre of area or on both the main and side frontages. The author of the selected design No. 3 has adopted the latter alternative, and in so doing has economised the areas allotted for the various departments. The vestry clerk and his assistants are placed in front towards Gossage-road and near the main entrance in centre, and these are approached by a corridor well lighted by two small courts, while the official next in importance, the surveyor, has his and clerks' offices located in convenient proximity to the vestry clerk, with a lobby of intercommunication, and occupies the corner between Gossage and Park-roads. These are conveniently arranged on the whole, which one or two slight alterations would improve. The accountant is placed on the left side of main entrance-hall, and the burial board and clerk in front. The main entrance to public hall is from Park-road; there are good crush-hall, cloak-rooms on both sides, entrance stairs to gallery, and spaces for the public. The great hall has a circular-cornered end, with seats for 1,000, the seats being in two rows, with crush-hall built out, and exit, and is well lighted.

The library block is separated from the main buildings, though it joins in front, making one façade. The entrance is in front, with space for borrowers on the right perhaps a little too contracted; the lending library forms the right-hand side, and is lighted by the side court and by skylights; on the Ancona-road side are the news and magazine room and library, with separate entrance at the side; and the librarian is placed so as to command the corridor between the two departments. The lighting is good, and each department has an independent approach. On the first floor the museum, 29ft. by 60ft., and annex in front, are over the news-rooms, lighted from side street, the lending department being kept low. The works committee-room, 48ft. by 28ft., is in front, next come the staircase, and along the main front are the committee-rooms, of good size, over the clerks' offices. At the corner of the main front and Park-road is placed the council chamber, to seat 100, with circular seats, domed, 37ft. 6in. square, lighted from both ends, and with separate entrance to gallery. These rooms comprise the main frontage. The caretaker's rooms are behind the Park-road wing. This distribution of the committee-rooms and vestry hall is convenient, and gives a more compact plan than if they were placed on ground floor. The author shows an elliptical-shaped ceiling over the public hall. There are six bays, divided by three-quarter columns along the sides, from which the ceiling ribs spring. The exterior elevations of brick and stone are relieved by rusticated columns. Over the central entrance a flat dome crowns this part of the façade, and the corners have small cupolas. These and the small pediments break the horizontal lines. The whole assumes a dignified and official character.

No. 30, the design placed second, has certain points of merit. The large hall is placed at the end along the Park-road frontage, and the municipal offices, which form a centre block, is mainly detached from the hall and library by two archways and courts which form features in this design. There are, in fact, three main blocks arranged parallel as regards their axes, and independent as regards entrances. The public hall is 88ft. 6in. by 56ft., with recessed platform, and has a spacious crush-hall in front, with main entrance and gallery stair exits in front, with exits to the side road. These are well arranged on the whole. There is a side corridor along the east side of hall, lighted by court, and connected to front crush-hall. The municipal office block is symmetrical in the distribution of the departments; on the right-hand side is the vestry clerk's suite of offices, convenient to main entrance, and lighted largely by the court; and on the left side is the surveyor's suite of offices, each with its own inner-side corridor, lighted by the central area; the drawing office is placed in a retired position, lighted from the court. In the centre, between these principal departments, is the main staircase and open area, which gives ample light to the corridors; the sanitary inspector's offices form a rear suite approached from either of the side corridors, and is lighted by a court behind. A stair to vestry hall is very conveniently placed for the vestry clerk, with an entrance from side court. Separated by a corresponding archway and court, which runs right through is the library block, with main front entrance, besides separate side entrance for the staff in the court. The news, &c., rooms flank Ancona-road, and are lighted from it. There is a long space for the public who come to borrow books, the counter separating this space from the lending library. The arrangement for supervision is not quite perfect.

On the first floor are the lecture hall and museum over library and part of lending library, and round the central area of middle block are the committee rooms, with vestry hall in front 72ft. by 30ft. placed lengthwise —a rather awkward area for seating, which is arranged in long, semi-elliptical concentric rows. There is a deep gallery over the large hall, with two corner stair entrances. On the whole, the design exhibits skill in the general blocking and distribution of the departments; the main offices are well planned. On the other hand, exception must be taken to the shape of the vestry hall and to some of the minor details of planning. In external design, an English Renaissance of a Late type has been chosen by the authors; there is a large tower at corner, over stairs to gallery of hall, with flat cupola. The two archways and courts are features in the front elevation, and serve to separate the blocks. The front is well broken up, certainly picturesque, and the design is marked by ability, if somewhat extravagant. The plans and details are well drawn.

No. 22, the third premiated design, is of rather a Domestic type of English Renaissance and Gothic in some of its features. The wide gabled end to hall is hardly pleasing, and the main front is rather wanting in unity, though there is some clever detail. The plan resembles the last described. The author has adopted the three-block arrangement, with the public hall placed lengthwise along Park-road, and its entrance end fronting Gossage-road. Like the second premiated also, there are two intervening courtyards between the blocks, but they do not continue through to the front. The vestry offices in the central block are approached through a rather too long and doubtfully-lighted centre corridor; and the positions assigned to the departments are unfortunate. The vestry clerk is placed in the rear with a projecting room instead of the front, as if he were a minor official, but has the vestry-hall above. The accountant is more conveniently placed. The surveyor has corresponding offices on the right-hand side; while in front, on the left-hand of entrance, are the sanitary and medical staff, and the overseer on the other side of entrance. The public hall, 75ft. by 60ft., by 40ft. high, has the platform deeply recessed between the stairs and retiring rooms for artistes, has a large entrance vestibule in Gossage-road end, with cloak-rooms and gallery exit stairs. There are also a number of exits provided along the Park-road front, with independent entrances for artists at the back. On the whole, the requirements of the L.C.C. seem to be fairly complied with as regards entrances and staircases. The library block is well arranged; there is a good lobby and hall in connection with the borrower's space, which forms a wide corridor between the issuing department and news-rooms. The reference-room is behind. The librarian's private entrance is in Ancona-road; a spacious corner staircase gives access to the museum over. The first-floor plan shows the committee-rooms over the front offices, and the vestry hall, 42ft. by 41ft. square, over the back part over the accountant and surveyors, though the connection between it and the clerk is not clear except by the front staircase. The roof of public hall is elliptical. The basement plan looks rather dislocated.

No. 19 adopts the rearward position of public hall, with its entrance in Park-road. Generally, the plan is compact: the offices are placed along the front, the clerk's on one side, and the surveyor's drawing-office on the other side of main entrance. The latter would have been better in a more retired position; but, as the assistant surveyor and draughtsman are bracketed together in the Instructions, there is a difficulty in separating the drawing office from the assistant surveyor except by a glazed partition. The latter functionary is, at least, quite as often seen as the principal, and therefore his office should be near the entrance, or, at least, easily approached. The library arrangement of No. 19 is good on the whole—a Classic Italian style, with centre tower and cupola are shown.

Some carefully-drawn detail is shown in No. 10, in a Georgian Classic dress. There is a recessed portico. In plan, the three isolated blocks are too close. The hall is placed, unlike those we have mentioned, in the centre, with the office and vestry-hall next Park-road. There is something to be urged for this arrangement. The public hall assumes a dominating position in the design, and can be made an imposing feature, while it allows two frontages for the official block, and side entrances to the different departments—an advantage in several respects. The shaped end to public hall is good acoustically. No. 5 also places the large hall in centre, with entrance in Gossage-road. The offices are not faultless, but the library shows some good planning. The three blocks are emphasised in the Classic design and roofing. In No. 33 the centre-hall arrangement is again adopted, but its ugly proportion, 68ft. by 66ft., is objectionable. It has a corridor on each side with three rows of seats, and the platform is not satisfactory in shape. The library arrangement is better, and the elevation is bold, with its two flanking towers to hall; but we take exception to the shape of hall gable between them. The style is of 18th-century Classic, with Ionic order in the front; but the ends are not in keeping, and we do not admire the very rococo decoration of hall. No. 16 is broadly treated in a Free Renaissance style, with clever elevations; the offices are placed along the front, but the space they occupy is wasteful, and four courts are requisitioned to afford light. No. 17 shows a broken plan, the offices lacking concentration, and the entrance to inspectors' offices narrow. The Late Gothic gables are out of character for such a building. No. 27 has the hall in rear and vestry-hall in front. The area occupied is large compared with many plans. The design is Italian, broken up and ornate. The large hall is flanked by two cupolas, and the author is lavish in his details. No. 14, a Classic design of 18th-century character, with flat roof and balustrade, contrasts with the high roofs of No. 27. There is a corner tower and cupola and dome over entrance; but the elevation is monotonous, and not well balanced. The plan is disjointed; the public hall is unnecessarily long, and is placed in the rear, with vestry offices and hall in front. No. 32 has also the public hall in the rear, and the municipal offices and hall in front. The lighting of the long corridor is doubtful; borrowed lights are shown to main staircase. The crooked corridor is bad. The style again is Classic, but well balanced; Ionic engaged columns adorn the front. The plans are well drawn. No. 21 has three semi-isolated blocks; the public hall is 76ft. by 60ft. wide in centre. There is a waste of vestibule and corridor space, and the author sets back the office block in Park-road to boundary line, which is objectionable. The entrance-hall of offices and parts of corridor would be dark. No. 36 has an imposing ink perspective of Italian Renaissance character. There is a corner campanile, and the fenestration in front, of Late Classic, is rusticated; but the plan is faulty. Another design is also in the same style, with angle tower and cupola of two stages and domical centre. The public hall is in the rear, and the plan is not studied. No. 39 is a clever sketch, with angle cupolas; the hall is placed along the front—an unusual arrangement—also the vestry and vestry-hall on first floor. A few of the plans have not provided for separate entrances to chief sanitary inspector's and overseer's rooms (question 18), and we are not sure that all the answers have been understood.

Other designs of merit in external design are No. 29, a Classic rusticated set, well drawn; No. 37, poor in plan, but with clever detail; No. 8 has well-proportioned Classic features and corner tower, but indifferent plan; No. 7 extravagant; No. 11 a design with some clever detail, palatial and rusticated, of a Florentine type, with long façade broken by a massive quadrangular-roofed tower, rather heavy. Many of these designs are either too palatial and ornate, or their plans are hopelessly arranged.

Forty thousand pounds are intended to be expended upon the offices and library; but this sum would be inadequate to carry out many of the designs. The allowance made in the Instructions for cubing—namely, 10d. per foot cube—is ample for the plans selected; but if applied to some of those exhibited with large areas of building and corridor, the total sum would be insufficient. We hope that the design that is carried out will be a credit to the vestry and the architect engaged, as well as help to brighten the rather dull and murky surroundings of the locality.

ROYAL SOCIETY OF BRITISH ARTISTS.

WITH much that we may pass over, there are several good pictures at this old gallery. In the Central Gallery, G. Hillyard Swinstead's large coast scene "The Evening Glow, Beer Beach, S. Devon" (2), a massive headland of rocky cliffs, tinged with the rosy glow of evening; and his portrait of a little boy (206), dressed as a little Cavalier, against rich scarlet plush curtains, show a versatility of subject not always indicative of success. "The First Sign of the Cross," by N. Prescott-Davies (3), is bold and somewhat symbolic. Eve, with extended arms, in one hand holds the fateful apple, Adam at her side; the figures are carefully modelled, and stand against a dark tree laden with fruit. The work is large, and the execution masterful. Near, S. Grant Rowe has a pleasing landscape "A Green Road through the Forest," and in the corner hangs another cleverly-painted subject "November" (11)—peasant women and a girl laden with wood, trudging through a lane bordered by leafless trees, the ruts, filled with water, reflecting the light of an afternoon sky. There is a note of sadness in the old women with their burden, the November sky, and the recent rainfall. Philip S. Newman has two subjects, one a pastoral the other allegorical, which have invention. No. 9 is graceful in composition. Breadth of handling is seen in G. C. Haite's "Hampshire Cottage" (19) with luxuriant blossom of rhododendrons in the foreground, and his power of arranging masses of shade and colour is seen in other works, as his "Timber" (228) and his other rustic water-colour piece "Picturesque Neglect" (252) in the North-West Gallery, where dilapidated cottages and the bloom of wild, uncultivated flowers produce a charming wealth of colour. Harry G. Shields has a pleasing study of a poppy field, T. F. M. Sheard, the secretary, several skilfully painted subjects: "The Parting Shot and the Maid and the Book" (38), "The Child and the Poppy" (49), and "Darby and Joan," all display a keen sense of incident and humour.

Robert Goodman, whose work has undoubted promise, sends a large landscape (over fireplace) entitled "Nature's Gaiety" (42)—a field of poppies broadly painted and admirable in the expanse of green grass dotted with the scarlet flowers, the colour and effect of which can be realised on the opposite side of the gallery; No. 125, by the same painter, is also excellent, and we also note in the South-East Gallery his portrait of Mr. Keith Cameron (174). Val Davis has a tenderly painted subject, "Marguerites and Daisies" (53), but perhaps the most remarkable picture in the room is F. Cayley Robinson's "A Winter Evening" (58). At first we are a little puzzled as to its meaning. What does Mr. Robinson's work, which is always thoughtful, convey? It is a simple incident of three girls in the firelight of a quiet country room. The painter has, in truth, honestly told a simple domestic incident in his own unaffected manner—quaintly, perhaps, with a semblance of pre-Raphaelitism and Burns-Jones in it; but, withal, truthfully. One, the elder girl, is looking into the fire, the other two standing near, listening, it may be, or simply dreamingly gazing into the light. They look sad; thoughts flash across them. There is a neat, clean cloth spread over the table; a harp in the corner, a chest of drawers; the room partially illumined by the evening light through the window, which throws in half-gloom the two younger girls, whose faces catch the reflected firelight. There is certainly a personal charm of the painter's own—a tenderness in sentiment; but we pass on to less original subjects. "Evolene," by W. T. Warrener, is a study of a little girl in blue dress, fresh in colour, in a white hood, seated before a table; there is a decorative treatment in the background, and the colour is bright. There is a vivid and open-air look about the work. Montague Smyth sends three delightful studies of landscape. His "Coast, Hunstanton," is a very pleasing sketch, subtle and truthful; his "Dawn," a soft, grey light effect of early morning, with a flock of sheep going along a country lane, and his "Morning: a Country Road" (86), are charming. We fail to see very much in E. Barough Johnson's portrait of a seated lady, "The Magnet," except that there is a personality in the sitter. She wears a low evening dress, and the expression is good. In the corner of gallery is a boldly-painted landscape, "Flying Cloud and Swaying Poplar," by Walter Fowler (96), breezy and fresh; a charming study of "Twilight," by W. Lee Hankey—a country woman and child on a roadside near a cottage, a monochrome, but feelingly painted. In "The Witch" the same harmony of tone is observed. A group of peasants are waiting outside a small cottage at nightfall; a light burns in a small window, where possibly the witch is unfolding the tale. There is an expectant look in the group of credulous villagers outside. The colour and evening shades are truthful and harmonious. No. 80, "A November Afternoon," a small wayside cottage on a desolate country road, is also painted with vigour and feeling. In the centre of gallery hangs a large canvas by Leonard Watts, a woman snake-charmer standing before a fountain basin amidst Classic surroundings of a Pompeian character. "Salambo, the Mystery of Tanit," is a somewhat erudite theme, and is painted with skill. Pallid and statuesque against a dark background, with her draperies at her feet, she stands with erect head, the serpent entwined round her body. The figure is life-size, well modelled and balanced, and the colour of dark greenish hues contrasts with low tones of drapery. The painter has at least succeeded in impressing the beholder with his theme. Near it is another large picture of a snake-charmer, Keats's "Lamia," by Abbey Altson, whose work is imaginative and in a decorative key of colour. The figure of the nymph seated "smiling on the green" banks of the stream is not very bewitching, but is the most ambitious of his poetic contributions. "A view of Dunottar," by Alfred S. Edward (119), is admirable in its tone and colour. We also note Rupert C. W. Bunny's "Venus and Cupid" (126); the very clever studies by H. M. Livens, of which there are several. His "Cattle" (7), and (88) "The Young Fancier," are all life-like and forcible. The president, Sir Wyke Bayliss, sends three interiors—one (No. 44) of Westminster Abbey (a charming little perspective); No. 162, "The Beautiful Savage." Siena Cathedral, is delightful in draughtmanship, light, and shade. The corbelled figure on pillar, the fine pulpit, and the bands of dark marble produce a richness, which is handled by the president in a masterly manner. A water-colour drawing of the "Old Choir of Bayeux" is even more charming.

In the South-East Gallery, No. 152, "Leaving Home," by W. Peter Watson, is true and touching. The girl in donkey-cart by the side of her father, bandbox in hand, is trying to solace her mother, who has broken down. A large picture by F. Millard, "Dawning Love and Dying Day," is luminous, but the sentiment weak. Adam E. Proctor's "Blackberries" (170) is nice in colour, and "Dutch Hay Barges," by

Montague Smythe, is impressive in its grand mass of barge and soft grey atmosphere, next to which is a large landscape "The Thames Valley," by Arnold Helcké, carefully painted. William Hunt's "Dwellers in Tents" (180) and T. F. M. Sheard's "An Arab Dance" (181) and Cecil Burn's picture of "Teazles," two fair-haired girls cutting the plant, are worth notice; while in the other gallery the most powerful picture is Terrick Williams's "Landing Fish" (205). Reginald Machell's symbolic and decorative work "The Descent of the Gods to Earth" (196) is unsatisfactory and tawdry in colour, and obtains little help from the carved frame. A large picture of birch trees, "An Autumn Morning," by H. G. Hewitt (199) and a decorative subject by Abbey Altson (211). W. Luker's little girl trimming a doll's bonnet, "Madame La Mode" exhaust the principal subjects if we except J. W. T. Manuel's "M. Bordenave" (213), a fat Frenchman—a type of "ferocious egotism" that amuses by its very ugliness, and the full-length portraits of two ladies, one by Hal Hurst (158) and the other by Robert Christie (165), both having a good sense of colour, if not otherwise successful.

The water colours comprise a nice figure-study of a girl in a wood, by Val Davis (214), a Venetian canal piece, by Harold Burke; Arthur Stewart's version of "The Magic Mantle" (220), quaint in drawing and colour; a few charming effects in Sussex, Surrey, and Suffolk, by Leopold Rivers (218, 234, 306); a luminous coast piece by Reginald Smith, studies by Lee Hankey, Charles Lowe, &c.; "Noonday" (241), an effective study of sunlight in a village, by V. Wyatt Burnand; a clever sky and reflection, by Hubert Coop (257); "Boulogne Market" (289), by Tom Browne; and studies by Arthur Tucker (293, 295) are some of the more attractive. Alfred J. Collister's work (274) is broad and fresh in handling. G. C. Haité has also a vigorous sketch of a market in a Continental city on the screen (302); and in the vestibule are a number of delightful cabinet studies in black frames of colour effects, by Frank Spenlove-Spenlove, chiefly in Devon, Holland, and Venice, that will repay inspection.

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ESTIMATES.—XXVIII.

STRUCTURAL CASTINGS.—COLUMNS, ETC.

LAST week we gave a few particulars about castings, and also a few prices. It is more reliable to obtain quotations from a firm of ironfounders who have a large business in the class of goods for special designs. Cast-iron columns are manufactured in several forms—solid and hollow. They should be of such height as not to exceed twenty diameters. A column this height, $\frac{3}{4}$in. thick, will carry about two tons per square inch of sectional area; and, of course, less in proportion to reduced thickness. A column 15 diameters high will safely carry $2\frac{1}{2}$ tons per square inch. We refer the student to tables and formulæ for these details. In estimating, the principal thing to know is the weight, how many hundredweight the column is, as the cost will be so much per hundredweight. Laxton gives for columns and girders of cast iron 9s. to 11s. 6d. per hundredweight; but the price will depend on the quantity, as a large number of columns of the same weight and pattern will cost 15 to 30 per cent. less than a few columns. Some large ironworkers sell hollow columns, stanchions, caps, and bases cast on, at about 12s. 6d. per foot run not exceeding 20cwt.; for greater weights the cost would be less. Cast-iron columns and stanchions are generally made stronger than absolutely required for the loads, and a factor of safety that is equal to one-quarter to one-sixth of the ultimate resistance is sufficient.

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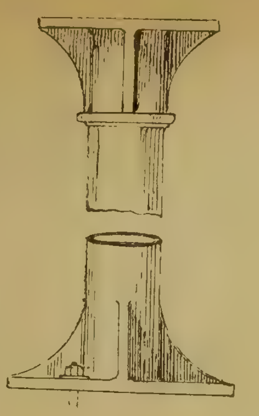

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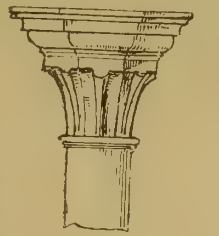

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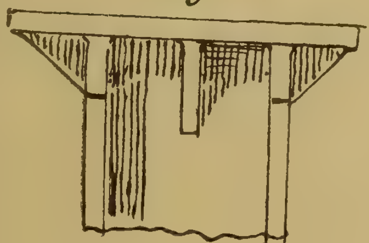

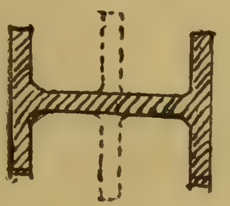

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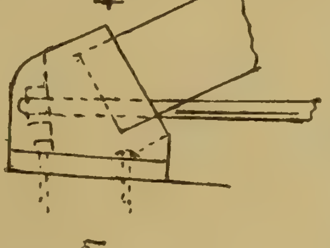

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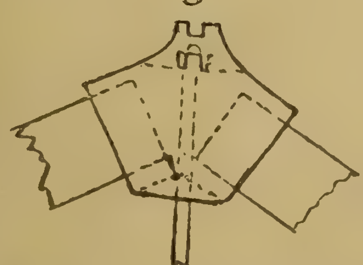

The weight of a cubic foot of cast iron is 444lb., so that the weight of a foot long of solid round column of given diameter is easily found. The area expressed in parts of a foot multiplied by 444 gives the weight of 1ft. in length. The weight of a hollow column is found thus:—Find the weight of a solid one of same diameter and also of a solid one of the diameter of the hollow; deduct the latter from former for the weight of hollow column. But tables are published giving the weight in pounds of one foot of cast-iron cylinders of different diameters. The following data are useful:—The weight in pounds of 1ft. of a cast-iron cylinder of 3in. bore, of $\frac{1}{2}$in. thickness, of metal, is 17·2lb.; of $\frac{5}{8}$in. thickness, 22·2lb.; of $\frac{3}{4}$in., 27·6lb.; of a cylinder $3\frac{1}{2}$in. bore, and of the same respective thicknesses, 19·6lb., 25·3lb., 31·3lb.; of 4in. bore, the respective thicknesses, 22·1lb., 28·4lb., 35·0lb.; if the bore is $5\frac{1}{2}$in., the weights would be for the above thicknesses 29·5lb., 37·6lb., 46lb.; of a 6in. bore, 31·9lb., 40·7lb., 49·7lb.; and for $\frac{7}{8}$in. thickness 59lb.; and for 1in. thickness 68·7lb. The weight of a foot superficial of cast iron 1in. in thickness is 37lb; that of a solid round rod 1in. in diameter, 12in. long, is 2·44lb., or, say $2\frac{1}{2}$lb., so that it is easy to find the weight of any other round or square rod by multiplying the square of its diameter by $2\frac{1}{2}$, as the weight increases as the square of diameter. For a square rod, multiply the square of one side by 3·1, the latter being the weight of a square cast-iron rod 1in. square and 1ft. long.

CAST IRON COLUMNS, ETC.

225cwt. 2qr. Cast-iron in 20 hollow columns, with loose base-plates and caps to design.

This is a large item, and we may take the weight of one column first. As there are 20 columns, each of them will weigh roughly 11cwt. 1qr. Cast-iron columns are quoted now at £8 15s. to £9 15s. per ton delivered, a high price, as a few years ago they could be obtained as low as £6 10s. per ton delivered. Put down £8 delivered as a speculative price, including patterns.

	£	s.	d.
Say, cost of 20 columns delivered	90	0	0
Unloading and fixing, say, 16s. per ton, say	8	16	0
	98	16	0
(Or equal to about 8s. 9d. per. cwt.) 10 per cent. profit	9	18	0
Total for 20 columns	108	14	0

42cwt. in six hollow columns and hoisting, at various heights not exceeding 40ft.

	£	s.	d.
These may be taken at, say, 9s. per cwt.	0	9	0
Unloading and fixing at 16s. per ton ...	0	0	9
	0	9	9
10 per cent. profit	0	1	0
	0	10	9

We have not taken into account this item of hoisting, but the price given is an average one, as they are fixed at various heights. It would be better to get a special estimate for these columns, including cartage, hoisting, and fixing, and profit. The quantity will affect the price.

18cwt. in No. 2 cast-iron hollow columns with moulded caps and bases to design 9ft. high.

These are special designs for which an estimate should be obtained, including cartage, profit, and pattern. If we put the price at 11s. per cwt., and add the cost of pattern and fixing, it will be an approximation.

	£	s.	d.
Cost of columns delivered at 11s. per cwt.	9	18	0
Cost of one pattern for ditto, say	1	15	0
Fixing, say	0	15	0
Total	12	8	0
Profit	1	5	0
	13	13	0

48cwt. 2qr. Cast iron in six stanchions of H section, including fixing on piers.

These may be priced at 9s. per cwt., including pattern. The fixing on piers would be about 16s. to 20s. per ton.

	£	s.	d.
Cost of stanchions delivered per cwt. ...	0	9	0
Fixing on piers at, say, 20s. per ton	0	1	0
	0	10	0
Profit	0	1	0
	0	11	0

The price for fixing a large number would be less, about 7d. per cwt.

18cwt. 1qr. in No. 2 cast-iron stanchions of + section, with cap, base, and stiffeners.

Price as in last, 9s. per cwt. If special design for cap and base, add for pattern 18s., say 1s. per cwt., fixing, &c., 1s., say 11s. per cwt.

44cwt. in No. 4 cast-iron hollow columns with octagon caps, loose base-plate, &c., according to design. (Sketch 2.)

Each of these columns would be about 11cwt., and we may price these as in our first item at £8 per ton exclusive of ornamental cap, or about 8s. 9d. per cwt.

	£	s.	d.
Cost of 4 columns delivered at, say, 9s. per cwt.	0	9	0
Fixing, at 16s. per ton	0	0	9
Cost of pattern would be for moulded cap and base, as per detail, say about 45s., say, per cwt.............	0	1	0
	0	10	9
Profit	0	1	0
Per cwt.	0	11	9

It would be better to get an estimate for these castings from a firm of ironfounders. Many large firms of ironmongers supply cast-iron columns to stock patterns, with ornamental heads, octagonal or round. (See Young and Marten's list.) These columns are made to certain heights; some of the larger ones are priced at so much per foot in height, 10s. to 12s. 6d. per foot.

No. 2. Cast-iron stanchions (10cwt. in each), and of H section, with cap, base, and stiffeners; height 11ft. each, including pattern.

Price these as before. For pattern put 15s.

	£	s.	d.
Cost at £8 per ton, per stanchion	4	0	0
Pattern	0	7	6
Fixing	0	16	0
Each............	5	3	6

No. 2. 4in. cast-iron columns, 10ft. high, with cap 7in. square and base 8in. square, with bolt holes of ⅝in. metal.

These are kept in stock, and the price is about 30s. each. Fixing may be put down at 1s. 9d. per cwt.—say,

	£	s.	d.
4in. cast-iron columns, each	1	10	0
Fixing at 1s. 9d. per cwt. (3cwt.)............	0	5	3
Bolts, &c.	0	1	6
	1	16	9

No. 2. Cast-iron columns, 9ft. 6in. high, with cap, 7in. by 7in., with bolt-holes, and base, 8in. by 8in., of ⅝in. metal.

These are to be had for about 27s. 6d. each, fixing, say, 2s. 6d. each.

ROOF CASTINGS, ETC.

5cwt. cast iron in five kingheads according to detail (sketch 5).

These are worth from 7s. 6d. to 15s. per cwt., according to design, and the fixing will be less if there is no cutting of principal rafters and kingpost, so that the kinghead projects.

	£	s.	d.
Cost of kinghead per cwt., say	0	12	0
Fitting and fixing to principals, each ...	0	2	0
Including profit	0	14	0

If the kinghead is let in flush with timber, the principals and post will have to be cut, and the cost of fixing will be about 2s. 6d.

Laxton puts the price of king and queen heads at 14s. to 16s. per cwt. The above price is exclusive of pattern for any special design. If such is required, add 6d. per cwt., as the cost of a pattern will be about 10s.

No. 10. Cast-iron shoes to ditto (1¼cwt. in each), and fixing to tie-beams and principals. (See sketch 4.)

If these are of the ordinary pattern they may be priced at the same rate, say 12s. per cwt. The fixing will be a trifle more, say 2s. 6d. each; but as there is 1¼cwt. to each shoe, the pricing per cwt. will be about 2s. Each shoe, including fixing, will be about 17s.

OTHER CASTINGS.

45cwt. 1qr. in cast-iron girders, 14ft. long, 10in. deep, and 1in. thickness of metal.

These may be priced at the same rate per ton, and add hoisting. It is best to obtain a price for this item.

	£	s.	d.
Say cost per cwt.	0	9	0
Hoisting and fixing, say	0	1	6
Per cwt.	0	10	6

No. 3. Area gratings, heavy castings 3ft. by 2ft. each, and ⅞in. thick.

These will cost about 17s. each, including profit and carriage.

No. 4. King-heads, weight 112lb. each, including pattern and fixing.

Price these as before. These are about 1cwt. each, and we may put them at—

	£	s.	d.
Per cwt.	0	12	0
Pattern (cost 10s.), say, per cwt.	0	2	6
Fitting to principals, each............	0	2	0
	0	16	6
Profit	0	1	6
Per cwt. or per king-head	0	18	0

No. 8. Cast-iron shoes.

These may be priced at about 16s. to 17s. (see previous item), including fixing to principals and tie.

KITCHEN RANGES, ETC.

No. 2. Kitchen ranges, 48in. high and 42in. wide, with hot plate 18in. deep, oven, &c., complete.

These vary much in price, from about £5 15s. to about £10 or more. The Coalbrookdale Co. sell strong close-fire ranges, with skirting, oven and side boiler, ashpan, bright mouldings and mounts to oven, 3ft. 6in. wide, with plate-rack, at £11; for open and close-fire arrangement, add 21s. The "Eagle" close-fire range, with rising and falling fire, 4ft. wide, is priced at £16. Hayward Bros. "Union" open-fire range, with cast L-boiler, 43in. wide, is priced at 190s.

No. 1. Strong kitchener, 27in. high, 19in. deep, 54in. wide, with two ovens, lifting fire, tile covings, bright mouldings, &c., complete.

This is a superior kitchener, and would cost from about £14 upwards, exclusive of boiler. A high-pressure back boiler would add 30s. to cost, and bright mouldings about 40s. Consult trade lists, such as Young and Marten's, where every description of kitchener may be found. The cost depends on height, width, depth, size of ovens, and quality of hot-plate, and finishings.

MISCELLANEOUS.

No. 4. Cast-iron window frames, 3ft. by 4ft., with segmental heads.

These sizes are made and kept in stock. One list prices this size at 11¼d. per foot super., say, including head, 1s. per foot. As there are 12ft. superficial exclusive of segmental head, the price would be about 12s.; add cost of fixing. Each sash would weigh about 7lb. per foot super., or 84lb. the sash, or ¾cwt. The above price is equal to about 16s. per cwt.

No. 6. Truss brackets to design, each 1cwt. 1qr.

The cost of these would depend on design. For plain brackets the price would be about 16s. to 20s. per cwt., say 25s. each, including fixing.

No. 2. Ornamental cast-iron panels to design, about 4ft. by 3ft.

If these are for balconies or windows, they would be worth about 12s. per cwt. If we assume each to weigh about 90lb., the cost would be about 10s. each, including pattern.

THE BRICK TRADE.

THE Kent and Essex Brickmasters' Association have reduced the price of stocks 4s. per thousand—*i.e.*, from 40s. to 36s. The price of stocks, practically the London standard brick, has been 40s. since April, 1898, and for twelve months prior to that it had ranged from 38s. to 42s. The fact of such a reduction is important. The Kent and Essex Brickmasters' Association is a very strong body; it includes all the oldest firms in Kent and Essex; it has successfully fought its labour battles, and has also arrived at a working arrangement which has maintained a uniform price for bricks. Its action in reducing prices 4s., or 10 per cent., at one step has a serious significance. It can only have been done for very strong reasons. Those reasons, strong as they are, are very simple.

HISTORY REPEATS ITSELF.

It is the old story, over demand followed by over production. The last boom in the brick trade was twenty years ago. Prices rose suddenly, and large profits were made. Everyone went in for brickmaking; new brickyards were opened all over the country. Then came the depression of 1880 and 1881, and prices fell. Stocks which had fetched 45s. to 40s. fell to 22s., or a price far below cost, and as a consequence many works had to stop. So, again, there is now the same experience. The Kent and Essex Brickmasters' Association, without attempting to create a monopoly or form a ring, arrived at a working arrangement whereby a uniform price was arrived at. Although the builders objected to this at first, they soon found it an advantage in tendering to be on the same level as to prices. Trade improved, prices advanced; people began to talk about the high prices obtained for bricks, and how little they cost to make. Everybody rushed in to share in the golden stream which flowed from brickmaking. New works to supply London were started—so far north as Lincoln, so far west as Stratford-on-Avon, for example—while the Peterborough district went mad.

FROM YAXLEY STATION TO PETERBOROUGH

it is now impossible to count the number of chimney-shafts, so numerous are they. The Peterborough output has doubled in the last five years, and it may be safely stated that there are upwards of 300 millions more bricks sent into London annually than there were ten years ago.

The great railway works, such as the Great Central, the Waterloo and City, and the City and Central are all practically completed. The speculative trade has been overdone. In other words, the supply is more than the demand, and the experiences of 1880 and 1881 are to be repeated in 1900 and 1901. Prices have been falling away, and the Kent and Essex Brickmasters' Association, recognising the fact, have reduced their prices to meet the falling market. Carlyle said that the population of the British Islands was composed of 30 millions of people, mostly fools. Never was the truth of this statement more exemplified than in the brick trade. Any practical brickmaker knows that on an average of 10 years he has three years of high prices and 7 years of low. So that on the ten years he gets a very small return on his capital invested. An actuarial return on the profits of brick-making would be a revelation to the uninitiated. The profit-earning capacity of the brick trade is, of course, well known to those who have been in it all their lives, and, in some cases, their fathers before them; but the outside public only look at the temporarily high prices, and go blindly in.

THE REACTION HAS SET IN,

and prices are likely to drop to the vanishing point of profit even in concerns established and built up at ordinary reasonable cost. In the trade circles there are rumours of limited companies being floated to enable those who have rashly entered into the brick trade without any previous knowledge to so profit by the short experience they have gained as get out of it at the expense of the investing public. It is said, but we know not with what truth, that there is a project to combine the Fletton Brickworks into one large company, and to place that company on the market, so that the public may stand in the place of the rash investors, who went into the trade hurriedly and want to come out in the same way. It will not work. As in 1880 and 1881, brickworks after brickworks had to stop, so in the next few years many of the ventures will come to grief, and our advice to the public is: Have nothing to do with any brick company however flourishing its prospects may be on paper.

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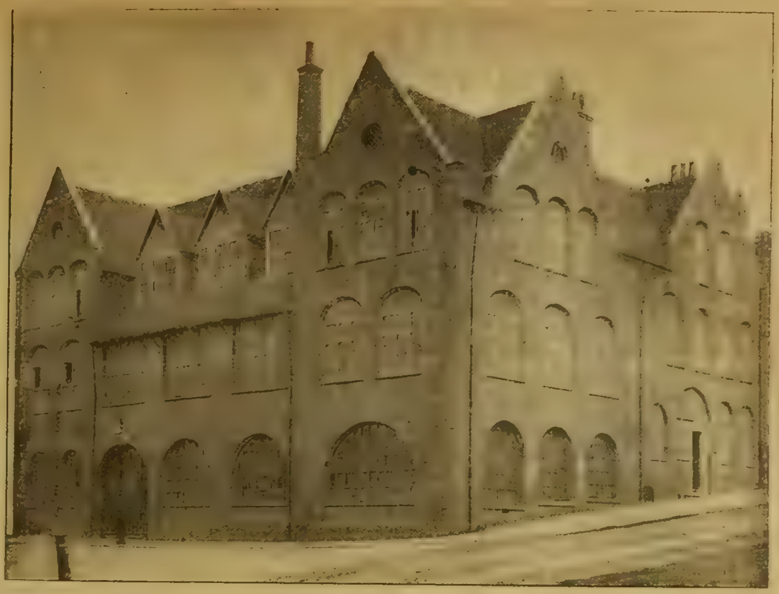
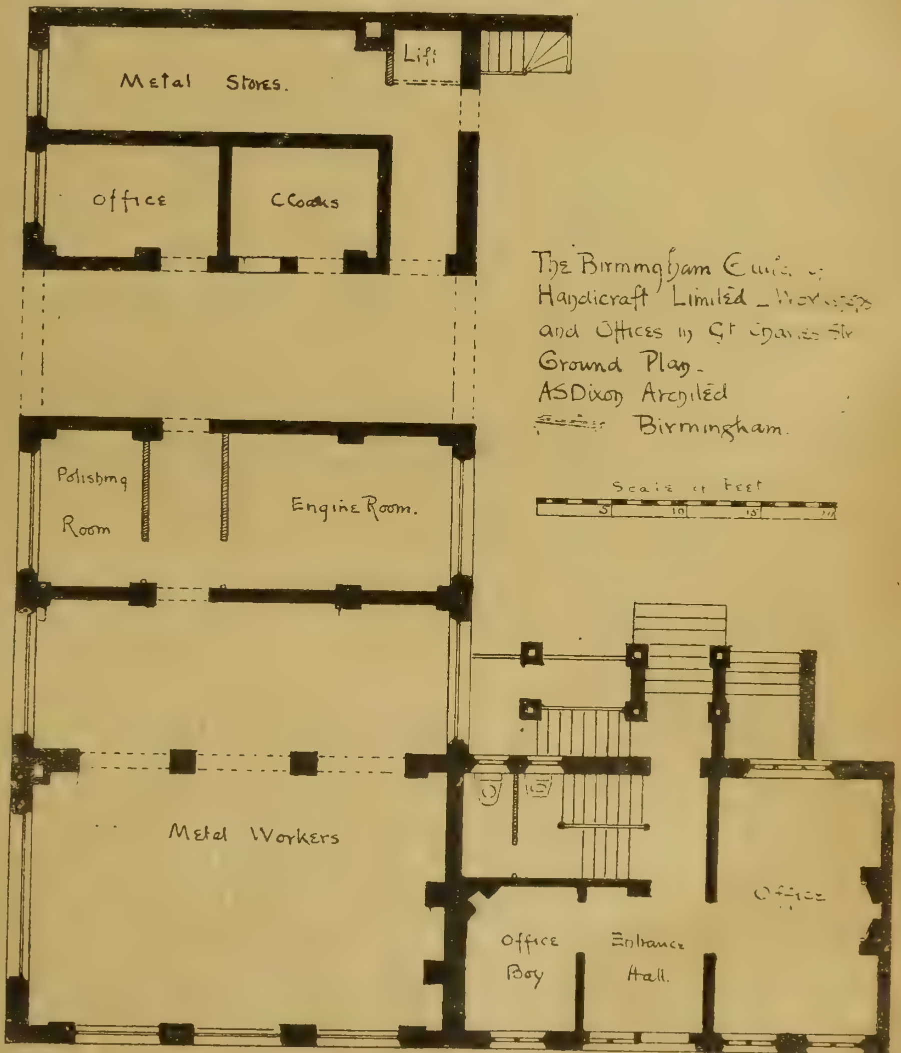
PREMISES OF THE BIRMINGHAM GUILD OF HANDICRAFT, LIMITED.

In the Arts and Crafts Exhibition at the New Gallery, Regent-street, among the few privileged architectural drawings admitted to that somewhat exclusive collection of contemporary work is a perspective view of this very practical building. It has been erected at the corner of Great Charles-street, Birmingham, from the designs of Mr. Arthur Stansfield Dixon, architect, the designer of the metalwork produced by this Guild, of which the Right Hon. William Kenrick is the chairman. The elevations are mainly in brick, with ample windows picturesquely treated. The plan, which we reproduce with the photographic view, explains the general arrangements. These comprise workshops and the offices of the company, with entrances from both thoroughfares.



PREMISES OF THE BIRMINGHAM GUILD OF HANDICRAFT, LIMITED.



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ELECTROLYSIS.

Among the papers presented at the recent convention of the American Society of Municipal Improvements was one on electrolysis from the standpoint of the municipal electrician by Mr. H. S. Wynkoop, electrical engineer of the department of buildings, lighting and supplies of the Borough of Brooklyn, New York. In Brooklyn there are about 600 miles of street railway track, six railway power houses well distributed and a daily average of about 1,900 cars in operation. Underground are the gas and water mains, Edison tubes, cement-lined iron subway ducts, earthenware subways containing lead-covered cables, supplementary wires and bundles of old rails used as ground returns. In addition, the structure of the elevated railway is being made the equivalent of a ground return through its bond connections with the tracks it supports. All of these conductors are jumbled together, forming an irregular network through which the stray electricity is dodging hither and thither. To increase the complications, intentional connections between dissimilar conductors have been made from time to time at the instance of experts retained by one or another of the corporations.

In earlier days the most generally accepted method of dealing with electrolysis involved the attaching of a bond wire to the damaged spot in order to conduct away harmlessly the electricity that was causing the trouble. By means of these bonds the various corporations are caring, in specific instances, for stray currents in amounts varying from 20 to 80 ampères. Each corporation has its own expert watching developments and applies its own remedies regardless of the effect on its neighbours or the disturbance of the electrical equilibrium thus occasioned.

The water department in Brooklyn since 1896 has simply been awaiting developments. In that year tests were made which gave indications that the cast-iron mains were reasonably safe. Careful examination was made of the pipes at so-called danger points, but no evidence of electrolysis was found. Neither has any damage occurred to the cast-iron gas mains, but the wrought-iron and steel service-pipes have been attacked. Telephone cables appear to be reasonably safe, but the electric-light cables are in an unsatisfactory condition. Edison tube is suffering greatly in some places and the cast-iron coupling-boxes have also been attacked. The experience of other cities is similar to that of Brooklyn, and the subject is almost invariably treated from one point of view, as in its relation to the gas system, water-pipes, cable-coverings, or the street railway.

Mr. Wynkoop considers the municipality responsible for the existence of the problem and for the securing of its solution for the following reasons:—It originally approved, by franchise, of the overhead trolley; the public interests are jeopardised, and the protection of such interests is a function of the municipality; it is generally the only body exercising authority over all of the private corporations operating within its boundaries. But in spite of its responsibility, the municipality is doing practically nothing to solve the problem. As a remedy, Mr. Wynkoop suggests a commission of nine members representing the various interests concerned in the problem and the electrical bureau of the city, if there be one. A lawyer and a chemist should also be on the commission—the latter because Mr. Wynkoop considers that chemistry is to play a large part in the solution of the problem.

In conclusion, Mr. Wynkoop states that "electrical remedies have thus far failed. The improved track return is a palliative, not a cure. The interbonding plan results in a ceaseless disturbance of the electrical equilibrium. The auxiliary potential method is applicable only to those towns whose electrical map is comparatively simple, and few of the larger towns come within this class to-day. The insertion of insulating sections of

TABLE I.—BARS OF THE WEB.

Load at	O A	A B	B C	C D	D E	E F	F *a*	G *a*	G H	H K	K L	L M	M N	N O
1	+ 12·11	− 8·57	− 2·02	+ 1·43	− 2·02	+ 1·43	0·00	− 2·02	+ 1·43	+ 2·02	− 1·43	+ 2·02	− 1·43	+ 2·02
2	+ 10·09	− 7·14	+ 10·09	− 7·14	− 4·04	+ 2·86	0·00	− 4·04	+ 2·86	+ 4·04	− 2·86	+ 4·04	− 2·86	+ 4·04
3	+ 8·08	− 5·71	+ 8·08	− 5·71	+ 8·08	− 5·71	+ 6·06	− 6·06	+ 4·29	+ 6·06	− 4·29	+ 6·06	− 4·29	+ 6·06
4	+ 6·06	− 4·29	+ 6·06	− 4·29	+ 6·06	− 4·29	− 6·06	− 6·06	+ 5·71	+ 8·08	− 5·71	+ 8·08	− 5·71	+ 8·08
5	+ 4·04	− 2·86	+ 4·04	− 2·86	+ 4·04	− 2·86	− 4·04	0·00	+ 2·86	− 4·04	− 7·14	+ 10·09	− 7·14	+ 10·09
6	+ 2·02	− 1·43	+ 2·02	− 1·43	+ 2·02	− 1·43	− 2·02	0·00	+ 1·43	− 2·02	+ 1·43	− 2·02	− 8·57	+ 12·11
Algebraic sum of stresses.	+ 42·40	− 30·00	+ 28·27	− 20·01	+ 14·14	− 10·00	− 12·12	− 12·12	− 10·00	+ 14·14	− 20·01	+ 28·27	− 30·00	+ 42·40

pipe along the line tends to throw an increased burden upon other conductors. Finally, not one of these suggested remedies offers more than a partial and temporary relief. All of them delocalise and render latent the evidences of electrolytic decay; but to just what extent is a hard matter to determine. Voltmeter readings are undeniably valuable, and yet, after all, they are merely resultants; so that, when accepted in their true light, they afford no absolute certainty that local action is not taking place in the immediate vicinity of the test points."

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TABLE II.—BARS OF THE WEB UNDER A UNIFORMLY DISTRIBUTED LOAD.

O A	A B	B C	C D	D E	E F	F *a*	G *a*	G H	H K	K L	L M	M N	N O
+ 21·21	− 15·00	+ 14·14	− 10·00	+ 7·07	− 5·00	0·00	0·00	− 5·07	+ 7·07	− 10·00	+ 14·14	− 15·00	+ 21·21

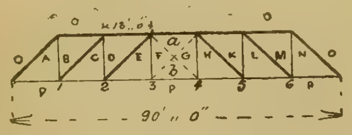
TABLE III.—BARS OF THE WEB.—TOTAL STRESSES IN TONS.

O A	A B	B C	C D	D E	E F	F *a*	G *a*	G H	H K	K L	L M	M N	N O
+ 63·61	− 45·00	+ 42·41	− 30·01	+ 21·21	− 15·00	− 12·00	− 12·00	− 15·00	+ 21·21	− 30·01	+ 42·41	− 45·00	+ 63·61

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XV.

HAVING fully investigated the stresses upon the flanges of the independent central girder in Fig. 1, arising from the action of both a uniformly distributed load and of a moving load, and designed the form, dimensions, and quantity of metal to be alotted to them, it remains to accomplish exactly the same result so far as a live or moving load is concerned for each member of the web. In article XI. general rules were laid down for determining these stresses, so that all we propose to effect at present is to demonstrate their application to the case before us. Referring to Fig. 1, in which the lower apices are numbered consecutively, let us consider the rolling load to have advanced from the left abutment as far as apex No. 1—that is, since the rolling load has been estimated as equal to twice the uniformly distributed load, equivalent to a load of ten tons at that point. The problem to be solved is: What is the amount and the nature, whether compressive or tensile, of the resulting stresses upon each individual member of the truss? Of the two, the nature of the stress is of almost greater importance than the amount, since upon that detail depends whether any particular vertical or diagonal is a strut or a tie, and whether it will need counterbracing or not. It must be borne in mind that before the moving load comes on the bridge, every member of the truss, except the pair of central diagonals, is already subject to stresses of a definite amount and character. If we regard the moving load to have advanced from the left support on the structure as far as apex A, it is not correct, as is frequently assumed in purely scientific textbooks, to consider the rest of the girder to be unloaded. It is very appreciably loaded, and, in girders of great span, exercises sufficient influence to very materially reduce the effect of a rolling load upon the members of the web.

FIG. 1.



Commencing our calculations, we have therefore a weight of ten tons situated at the first apex counting from the left abutment. How is this load resisted and disposed of? It first induces tensile stresses upon both the vertical and diagonal members A B and B C, in Fig. 1. The stress upon A B, on arriving at the first upper apex may be resolved into two, both of a compressive character in the direction of the upper flange and the terminal member of the web O A. With the stress upon the upper flange we are no longer concerned, as they have all been ascertained, and the calculations in connection with them completed. Before proceeding with the stresses upon the members of the web to the right of apex I, it will be as well to determine those upon A B and O A. It will, therefore, be necessary to find what portions of the weight of 10 tons at the lower apex are transferred to each abutment, or, what amounts to the same thing, to find the value of the respective reactions at each support. Let R_1 = the reaction at the left, and R_2 that at the right abutment. Put W for the weight, l for the length of each panel, which are all of the same dimensions, and L for the span of the girder, which in this instance must be made equal to an exact number of panel lengths. Then, upon the principle of the lever, which, in its turn, is dependent upon the principle of moments, we have for the value of R_1—

$$R_1 = \frac{W \times 6 \times l}{L} \ldots\ldots\ldots\ldots (1)$$

For R_2 the corresponding equation is—

$$R_2 = \frac{W \times l}{L} \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

Substituting the numerical equivalents of the symbols in the above equations, we obtain for each reaction—

$$R_1 = \frac{10 \times 6 \times 13}{L} = 8{\cdot}571 \text{ tons } (3)$$

and for R_2—

$$R_2 = \frac{10 \times 13}{L} = 1{\cdot}428 \text{ tons } \ldots (4)$$

Applying the general formula—

$$W = R_1 + R_2 \ldots\ldots\ldots\ldots\ldots\ldots (5)$$

the expression becomes in figures—

$$10 = 8{\cdot}571 + 1{\cdot}428 = 9{\cdot}999 \text{ ton} \ldots\ldots (6)$$

or a practical identity. As it will be convenient to make the sum of the reactions coincide exactly with the weight, the equality can be readily, and according to the usual rule for decimals, arrived at by making $R_2 = 1{\cdot}428$ equal to 1·43, and R_1 equal to 8·57, which gives—

$$10 = (8{\cdot}57 + 1{\cdot}43) = 10 \ldots\ldots\ldots (6)$$

The vertical shearing stress arising from a single or any number of weights is always equal to the reactions conveyed by any vertical member of the web to their respective points of support. Thus, in the present instance, the vertical tensile or shearing stress on A B is equal to the reaction upon the left abutment, that is equal to 8·57 tons. So the compressive stress upon the terminal diagonal member of the web is equal to, as $\cos. \theta = 1{\cdot}414$.

$$8{\cdot}57 \times 1{\cdot}414 = 12{\cdot}117 \text{ tons.}$$

Using the same formula for the members of the web situated to the right of the lower apex I, the tensile stress upon the bar B C amounts to—

$$1{\cdot}43 \times 1{\cdot}414 = 2{\cdot}022 \text{ tons.}$$

As a check upon the calculation, 2·022 multiplied by 6 should equal the stress already found for A B, which it will be found to do, the difference not exceeding 0·002, an absolutely negligible quantity.

This stress upon B C will be successively resolved into its vertical and diagonal components, which, neglecting for reasons previously adduced, the horizontal components upon the flanges will produce a uniform stress upon all the vertical members of the web of 1·43 tons and one of 2·02 tons upon all the diagonals situated between apex No. 1 of the lower flange and the right abutment. It will be unnecessary to enter into the same degree of minuteness with respect to the action of the load at the next lower apex No. 2, when the rolling load has advanced to that point. It is obvious, on reference to Fig. 1, that the reactions at each support will be for the left abutment—

$$R_1 = \frac{5 \times 10}{7} = 7{\cdot}143 \text{ tons.}$$

and that for the right abutment—

$$R_2 = \frac{2 \times 10}{7} = 2{\cdot}857 \text{ tons.}$$

When the rolling load reaches the third lower apex, another constant addition to the reaction at the right support takes place, and a similar deduction from the results already occurring at the left support. It is not difficult, therefore, to tabulate the total stresses upon each member of the web by a summation process, which will give both their amount and character. For example, if S be the stress upon the bar B C, that upon N O over the right support will be equal to the total of—

$$S\,(1 + 2 + 3 + 4 + 5 + 6);$$

but since S is equal to 2·02 tons, the stress upon N *o* will equal

$$2{\cdot}02 \times 21 = 42{\cdot}64 \text{ tons,}$$

which can be checked by the formula—

$$R_2 \times \text{cosec.}\, \theta = 42{\cdot}42 \text{ tons.}$$

In Table I. are given the bars, both vertical and diagonal, in the web, and the amount and character of the different stresses induced upon them by each successive position of the rolling-load as it traverses the whole bridge from one end to the other. The algebraic sum will give the maximum compressive and tensile stresses upon any bar corresponding to any given position of the rolling load. There are one or two rules in connection with the maximum compressive or tensile stresses upon any member, either vertical or diagonal, of the web, which deserve attention. The maximum compressive stress upon any bar, which is a strut, resulting from a rolling load, that is, subject to a stress of the same character under the conditions of a uniformly distributed load, and situated upon one half of the girder or truss, will take place when all the apices between it and the abutment on the other half of truss are loaded. Again, the maximum tensile stress upon the same bar will occur when the apices on its own half of the truss are loaded. Referring to Fig. 1, consider the bar D E, which is acted upon by a compressive stress when the load is uniformly distributed over the truss. Its maximum compressive stress will be brought upon it, when the apices 3, 4, 5, and 6 are loaded, and the remaining apices 1 and 2 unloaded. Its maximum tensile stress will occur when the apices 1 and 2 are loaded and the others unloaded. It will be seen on consulting Table I. that the maximum compressive stress on the bar D E is equal to—

$$+ 8{\cdot}08 + 6{\cdot}06 + 4{\cdot}04 + 2{\cdot}02 = 20{\cdot}20,$$

and its maximum tensile stress to—

$$- 2{\cdot}02 - 4{\cdot}04 = - 6{\cdot}06.$$

Similarly, the maximum tensile stress upon the vertical bar C D takes place when the apices 2, 3, 4, 5, 6 are loaded, and its maximum compressive stress when apex 1 is loaded. In Table I. the maximum tensile stress, due to the loaded apices enumerated, is equal to—

$$- 7{\cdot}14 - 5{\cdot}71 - 4{\cdot}29 - 2{\cdot}86 - 1{\cdot}43 = - 21{\cdot}43,$$

and its maximum compressive stress to + 1·43.

It will be of advantage to the student and beginner to check by another method the accuracy of the figures given in Table I., and first for the compressive stress upon diagonal bar D E.

The portion of the total weight of 10 tons placed at apex 6 conveyed to the left support is 1·43 tons, which is also equal to the vertical stress upon the bar M N in table I. Putting S = stress upon the diagonal bar L M, and remembering that θ, the angle between the diagonal bars and the horizontal, is 45°, we have—

$$1{\cdot}43 = S \times \text{sine}\ \theta$$

from which—

$$S = \frac{1{\cdot}43}{\text{sine}\ \theta} = 1{\cdot}43 \times \text{cosec.}\ \theta$$

and finally—

$$S = 1{\cdot}43 \times 1{\cdot}414 = 2{\cdot}02 \text{ tons.}$$

Summing up for the compressive stress upon D E, we find it to be equal to

$$+\ 2{\cdot}02\,(1 + 2 + 3 + 4) = 2{\cdot}02 \times 10 = +\ 20{\cdot}20 \text{ tons,}$$

as obtained from Table I. For the tensile stress, the calculation gives it equal to—

$$-\ 2{\cdot}02\,(1 + 2) = -\ 2{\cdot}02 \times 3 = -\ 6{\cdot}06 \text{ tons.}$$

It is unnecessary to adduce any further proofs of the accuracy of the results arrived at in the Table, although they are all equally susceptible of similar proof. It remains now to determine where the counterbraces are to be introduced, and for this purpose it will be necessary to combine the stresses in Table I. with those previously obtained for the vertical and diagonal members of the web when subjected to the action of a uniformly distributed load, which are given in Table II.

It must be borne in mind that when tensile stresses are brought upon bars under a stress of compression, they may be disregarded so far as any counterbracing is regarded, which is only required to be considered when bars in tension are from one cause or another thrown into compression. This much being surmised, the first bar which claims our attention is C D in Table I., which is in tension, but has the small compressive stress of 1·43 tons brought upon it. But upon referring to Table II., it will be seen that there is always a constant tensile stress due to the dead load upon C D equal to 10 tons, so that the actual resulting stress is still a tensile one of 8·57 tons. Passing on to the bar E F the two stresses are so nearly balanced that the counterbracing in the central panel is desirable. If, now, we combine the two tables, we shall obtain the total stresses upon all the members of the web, which will afford us the necessary data for calculating the quantity of metal each will require, and the proper proportions to be assigned to them individually.

T. C.

NEW DESCRIPTION OF ARMOURED CONCRETE.

IT is universally recognised that whenever a mixture or combination of two or more ingredients, substances, or materials has to be effected, the first and most essential detail to be attended to, and its accomplishment absolutely insured, is that the separate units of the combination should be as intimately and thoroughly amalgamated and incorporated with one another as possible. Unless when united the different constituents of the union invariably act as one body or mass, the combination will inevitably carry with it the seeds of its own dissolution and disintegration, and ultimately go to pieces. Unquestionably concrete, when properly composed and properly made, is one of the very best substances to form a close and intimate union with other bodies. Its numerous rough, sharp, angular points which it presents to other substances offer just so many means of attachment and of intimate combination. We have advisedly premised that the concrete in itself should be properly prepared and composed, for otherwise the necessarily complete intermixture cannot be carried out. Obviously this required result could not possibly be achieved if the concrete were composed of smooth rounded stones, as, for instance, as sometimes occurred in localities situated near the sea coast, where from notions of mistaken economy, shingle has been used for the purpose. Judging from the actual examples of arches of both large and small spans of floors, embodying many different types of designs and construction, and of other works in which armoured concrete has been adopted with marked success, there is no reason to complain of a want of cohesion between the separate parts.

FIG. 1.

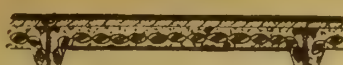


FIG 3.

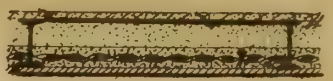


FIG 2.

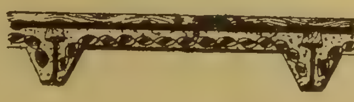
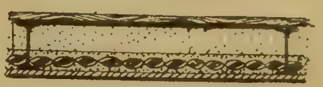


FIG. 4.



It must, at the same time, be admitted that the concrete plays by far the greater part in accomplishing this desirable result, since the smooth surface of the various sections of wrought iron and steel employed are not *per se* especially favourable to the required intimate union. It is not to be wondered at, therefore, that, this fact once recognised and acknowledged, attempts should have been made and experiments undertaken with the object of remedying the defect. The most recent of these, and the one which bids fair to overcome the difficulty, is that which we at present bring to the notice of our readers.

This novel application of the compound principle of concrete and metal forms the subject of a patent taken out by the firm of Thomas Steinhoff, of Mullheim, in the south-western part of Germany. Its chief distinguishing characteristic, which deserves especial attention, is shown in the four accompanying illustrations, and consists in imparting to the various sections of iron and steel a spiral shape—in other words, in twisting them. One of the designs is illustrated in Fig. 1, which represents one bay of a fireproof floor. The rolled joists, which are of the usual double-flanged pattern, together with the twisted sections of metal, are imbedded in concrete, and the upper surface of the floor is finished off with a strong layer of neat cement. In the second figure, as well as in the remaining two, the rolled joists perform the duty of supporting the weight of the rest of the structure, the load upon each being equal to that of one complete bay. In Fig. 2 the concrete serves as usual as the matrix surrounding and inclosing hermetically the metalwork, and is coped, as in the preceding design, with a layer of cement; but in this instance floor planks are laid down over the cement. These two systems are chiefly suitable for cellars, underground stores, factories, and workshops, and the other two shown in Figs. 3 and 4 are better adapted to the wants of public buildings and private houses on a large and pretentious scale, where more finish is desirable and the expense is not of so much importance. Thus the arrangement in Fig. 3 consists of a bed of concrete, reaching to about half the depth of the rolled joists, counting from the bottom flange. Upon the upper surface of the concrete, a good thick mass of clean dry sand or of well-sifted cinders is laid, and upon this oilcloth or linoleum may be placed. The arrangement in Fig. 4 is very similar to that in Fig. 3, but the floor is laid with planks, and in both cases plastered ceilings are wrought upon the concrete.

It is evident that the spiral or twisted form given to the metalwork must greatly increase the amount of "grip" between it and the concrete, and the inventor's claim that, in addition, the maximum strength and resistance of the compound structure is very materially augmented. As a mean of several experiments undertaken to investigate this point, the following result was arrived at:—A platform, having a span of 5ft., was constructed in the manner already described and illustrated, furnished with three rows of twisted metal at equal distances apart of 3ft. 3in., supported a load of 12cwt. per square foot without showing the least sign of deflection or any appreciable evidence of cracks or fissures. It is intended to carry out some further experiments upon a larger scale, to more thoroughly test the full efficacy of this new application, which we shall lay before our readers at the proper time. The subject is not only an interesting one from a general point of view, but is exceedingly instructive and worthy of consideration for the ingenuity displayed, and the part it is likely to play in future works of a constructive character.

The Corporation of London have agreed to pay £40,000 for the site of the male wing of Newgate Gaol, and it is intended to use this amount in connection with the extension of the prison at Brixton.

BRICK PAVEMENTS.

THE abundance of good granite for paving blocks and hard ledges from which satisfactory macadam stone can be obtained has, says the *Engineering Record*, made it unnecesary for the engineers of New England to pay as much attention to paving brick as those practising in less favoured parts of the United States. Hence their views are not warped by local necessities, which sometimes render brick the only available material. Mr. L. M. Hastings, city engineer of Cambridge, Mass., described the results of a study of brick pavements in a paper presented last week to the American Society of Municipal Improvements.

Vitrified paving brick was suggested as a paving material for Cambridge, and a committee of the city government made an inspection of streets surfaced with it in a number of cities, and also visited several large brick-making establishments. The oldest bricks seen were said to have been in service about 10 years, and were made apparently of the same material used in ordinary building brick. While they were badly chipped, and some were soft or under-burned, nevertheless the pavement as a whole seemed good for several years' further wear. As a general thing the evidences of durability in well-selected brick were better than the committee had been led to expect.

Young as is the paving-brick industry, there is now a surprisingly large number of establishments engaged in it in the States, and it is not surprising, therefore, that the product shows a wide variation in its properties.

Samples of the three classes of paving brick were seen in service in the cities visited, and it seemed that special merits might well be claimed for each of them. Thus, the shale brick and the class made from a mixture of shale and fireclay seemed hard, dense, and heavy, with a tendency toward brittleness. They are apparently adapted for streets with heavy traffic if laid on a strong concrete base, and their joints are filled so as to prevent the chipping of edges and corners. On the other hand, the fireclay bricks are lighter, softer, more porous, and apparently less liable to chip and crack, but they are much more subject to attrition by wheels and hoofs. They seem well adapted for a residential street or one carrying a light local traffic. Several streets paved with mixed brick were seen which seemed to be standing well. It is claimed by the manufacturers of such brick that the introduction of a part of fireclay into the shale makes the burning easier because the mixed material will bear a higher degree of heat. So much has been printed in these columns in recent years concerning the manufacture of brick, that it is unnecessary to follow Mr. Hastings' notes on the subject. The examination made by the committee failed to detect any difference in the wear of wire-cut and repressed pavers, although the latter made a better-looking street at only a trifling increase in cost. No general agreement could be found as to the size of the brick. The lighter coloured, softer brick noticed in some of the older pavements showed the effects of wear much more than those of a darker, harder character. It is highly desirable for the bricks to be of uniform hardness, and this quality can only be attained by careful burning and the culling of inferior brick before laying.

The jointing material has long been recognised as exerting an important influence on the durability of brick pavements, but no decided tendency towards the use of any one material could be detected. Sand makes a good filler for a time, being inexpensive and reducing the liability of noise, but it soon washes out, leaving the edges of the bricks unsupported and liable to be become chipped. Pitch tends to soften too much in hot weather and run towards the gutters. Murphy grout works well in places, being fairly hard and elastic, but is reported to be uneven in its results. On the whole, the best joints seem to be made by using a high grade, well-seasoned Portland cement, containing the smallest amount of free lime. The presence of the lime increases the tendency of the filler to swell with age and the absorption of moisture, thereby raising the brick from the foundation and producing a rumbling noise in an otherwise unobjectionable pavement. It is now thought that this tendency to rise may be remedied by introducing at intervals of 25ft. or 30ft. across the street and at both curbs an expansion joint of pitch, which will take up any movement due to the swelling of the filler.

The most satisfactory foundation for heavy traffic and poor natural conditions is a 6in. layer of American cement concrete on a base which has been thoroughly graded and compacted by a steam roller. A sand cushion 1in. or 2in. thick is placed between the concrete and the brick. Cracked stone has been used in some places as a foundation, but the results were not entirely satisfactory, for the sand of the cushion was washed more or less into the voids in the stone. Nevertheless, Mr. Hastings believes that if the cracked stone were used without screening, covered by a layer of sand or fine gravel, and then wetted thoroughly and rolled, a satisfactory and economical base would be formed. In some cities where a clay soil is encountered, it is considered necessary to provide underdrainage for the foundation, the common method being to place a subsoil drain about 3ft. below the surface under each kerbstone. The trench is filled with small stones which serve as a foundation for the kerb.

As a result of the investigation of the committee, brick pavements on a 6in. concrete foundation, with Portland cement joints and asphalte expansion joints at intervals, are now being laid by day labour in Cambridge, Mass. All sewers and pipes are laid to the kerb line before the pavement is put down, and if it becomes necessary in the future to open any streets paved with brick, the work will be done under the direction of the superintendent of streets, and its cost and the expense of restoring the pavement will be charged to the party for whom it is performed.

THE ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting for the present session of the Architectural Association was held on Friday evening, the President, Mr. G. H. Fellowes Prynne, F.R.I.B.A., in the chair. The following 33 gentlemen were elected as members: Messrs. A. J. P. Carrington, H. C. Quérée, N. O. Searle, D. Anderson, R. B. Rowell, H. Greenby, H. R. G. S. Smallman, R. H. Dods, D. Hayworth, C. M. Crickmer, W. Jackson, F. L. Atwell, R. F. Bacon, C. V. Bisley, L. F. Buckingham, S. Burgoine, W. E. V. Crompton, A. Dicken, C. P. Fleetwood, J. E. Forbes, N. Innes, L. Karberry, C. C. Mallins, F. M. Miles, G. Morland, R. H. Stone, H. F. Tucker, C. J. Thompson, A. W. Tippets, B. D. Tracy, R. J. Tyndall, F. W. Williams, and Maclaren Ross. Fourteen nominations were read, and it was announced that Mr. W. Duffett and A. H. Colquhoun had been reinstated as members. A vote of thanks was accorded to all who assisted in making the *conversazione* of the previous Friday a success, special mention being made by the President of the services of Mr. G. B. Carvill, hon secretary.

CIRCULAR STAIRS AND SPIRAL VAULTS.

The following paper on this subject, by Mr. Lawrence Harvey, was read, in the absence of the author, who is now living in Geneva, by his former pupil, Mr. W. H. Johnson:—The invention of circular stairs winding round a solid newel is, said Mr. Harvey, Mediæval. I cannot say to a certainty when the first winding staircase was built, but there are no precedents in either Greek or Roman architecture for that constructional feature. The invention of the winding stair arose out of the requirements of military architecture. What was aimed at in the design of castles and fortified places was, amongst other things, compactness; for, given a certain number of men as garrison, the defence will be strong in inverse ratio to the extent of the wall to be defended. Hence followeth that all spaces that are not required as dwellings or stores should be reduced to a minimum. Amongst these spaces are the staircases. In the designing of stairs in a fortress, a point of great importance is that the stairs be easily defended. All these advantages were secured by

CIRCULAR STAIRS ROUND A SOLID NEWEL.

These stairs take the least room on plan. They are easily defended by one brave man against any odds, as only one assailant at a time can come to the front, and that assailant is placed unfavourably for either attack or defence, and cannot receive any support by bow and arrow or musketry from men placed behind him, as would be the case in a straight flight of stairs. It is always a matter of surprise for me to find with what directness Mediæval architects found readily the best solution for the constructional problems of the time, a directness and a happiness which we only find to-day in the work of our mechanical engineers. I do not think that Mediæval architects were men better gifted than ourselves, but I consider they were particularly happy in not being encumbered by architectural traditions, and in having begun their architectural career as simple workmen, either as carpenters or as stonemasons. Free from our preoccupations of re-editing certain past styles of architecture, Mediæval architects saw only the constructional problems they had to deal with, and the constructional means they possessed for solving these problems. Moreover, as carpentry and masonry require certain geometrical operations, they developed in time a great power of design, combined with an equally great power of working materials into all kinds of ingenious combinations. Our modern architectural students are at quite the opposite of the training which gave Mediæval architects their unsurpassed cleverness. They are called upon to carry an enormous load of traditional architectural forms, and a minimum, not to say no practical or geometrical knowledge whatever. As a specimen of the modern way of treating architecture, I remember a design of a law-court I made in my first year of pupilage at the Ecole des Beaux-Arts. I was asked to design it in Doric Greek. How I tortured halls, chambers, and private rooms to bring them within the frame of a Greek temple nobody can tell who has not tried his hand at a similar task. The result was not unpleasant, nor even practically absurd; but I very much question whether this kind of designing is a healthy exercise for either student or even mature architect. There is less harm in

RE-EDITING GOTHIC ARCHITECTURE

of any given period, because this architecture is nearer to us, suits our climate, sometimes our requirements. But even then mere re-editing cannot but impoverish both reasoning powers and imagination, and I should prefer the Mediæval way of becoming an architect—that is, obtaining through workshop practice a thorough knowledge of all the means of solving constructional problems, and through lessons given in small classes the geometrical knowledge necessary for dealing with all the forms one may require in building. This done, I should advise to go about one's work in the same spirit and way as Mediæval architects—that is, design what suits best the purpose the buildings have to serve, according to the constructional means at our disposal. Geneva is particularly rich in

CIRCULAR STAIRCASES.

Up to the end of the last century none but such staircases were used even in the noblest mansions, for Geneva was a fortified town surrounded by powerful enemies, and hence space was most valuable. These stairs are called des "Virets," a local denomination which comes from an old French verb "virer," to turn round. Amongst the oldest are, no doubt, those which lead up to the towers of the cathedral. They were built probably in the beginning of the 12th century. Their radius is about 3ft. 8in., the newel had a diameter of about 8in., so they leave a clear space of about 3ft. 4in., which allows a person going down and one going up crossing one another on the stairs. The steps are not of equal height. In the lower part, measured in the middle, the steps have a rise of 8in. and a tread of about 11in. There are sixteen steps to one wind, which gives an ascent of about 10ft. 8in. for one convolution. I have noticed that the back of the step as well as the riser go to the centre of the newel, an arrangement which leaves very little stone where the step abuts against the newel, and should be discarded. In later work the back of the step is made tangent to the newel whereas the front part still runs to the centre of the newel. In an old castle I have seen some days ago, I noticed that the back of the steps had been finished off with a chamfer, thus making an approach to a continuous ceiling as soffit of the staircase. To make a continuous soffit to a circular staircase requires a rather developed knowledge of geometrical construction so as to provide a joint which in all its parts shall form a square angle with the soffit of the step. The geometrical constructions required for setting out such a staircase are fully explained in the number of July 31, 1891, of the Building News, and models of the structure have been made by my pupils in the Guilds' Institute. I may only say that once the lines have been put on, the steps are worked very easily, and have a most satisfactory effect. It is to be observed that as each step is housed in the wall, and at the other end forms part of the newel, it is desirable that the wall and the newel should bear the same weight, otherwise the steps submitted to unequal pressures would break. The newel, if not the steps, should rise, therefore, to the same height as the wall. A very good arrangement is to finish the upper part of the staircase with a fan vault resting on the newel.

NEW STEPS FOR CIRCULAR STAIRS.

In course of time steps are worn out, and in circular stairs new steps are very difficult to fix. To meet this difficulty, it is far better to lay the steps on the extrados of vaulted ceilings, which follow the rake of the stairs. This led to the invention of the spiral vault, called Vis St. Gilles, the construction of which is given in the number of Aug. 21, 1891, of the Building News, and of which a model was made from my drawing. The voussoirs of this vault are worked on the same principles as winding handrails. As all the voussoirs of one course are identical, it is a very easy vault to construct with concrete blocks. It requires only the working of as many blocks as there are courses, and casting all the others from these models. In a spiral vault

THE NEWEL IS USELESS,

and the vault would quite as well round an open well-hole. In that case the vault would look better by having as section either a quarter of a circle or a quarter of an ellipse. I think it is much to be regretted that the geometrical stairs in the south tower of St. Paul's are not supported by such a vault instead of resting merely on the edges of the steps. In the Town Hall of Geneva there is an inclined road that rises to the top of the building round a square well-hole, and which rests on Gothic groins. A similar vaulting is shown in Fig. 244 of the same issue of the Building News quoted from just now. The spiral vault may be intersected with raking arches to correspond with arches in the outer wall. This is a problem which my pupils have not attempted, but the elements of which they will find in the construction of the groining of an annular vault given in the number of August 23, 1889, of the Building News. I am quite aware that the explanations I have given in this short paper are quite insufficient for helping those who have not studied stereotomy in constructing even the simplest spiral vault, let alone all the beautiful combinations which can be designed. But I hope the members of the Architectural Association will find in what I have said an incentive to form practical classes for the study of descriptive geometry and stereotomy. If so, I shall be glad of having written these few lines, as I firmly believe the studies I have spoken of above will have a most favourable influence on the future of English architecture.

Mr. Johnson followed the reading of the paper by some explanations, illustrated by models and by diagrams on the blackboard, of the manner in which, following Mr. Harvey's theories, he was teaching the students in Westminster Technical College to attack various difficult problems in masonry, and more particularly in staircase work. He regarded Mr. Harvey's method of teaching as sound and practical.

Mr. A. T. Bolton, in proposing a vote of thanks to Messrs. Harvey and Johnson, suggested that it was improbable that Mediæval architects set out their vaults on scientific lines, as Mr. Harvey seemed to infer; indeed, much of the charm of old Gothic work was due to its irregularities. Though the methods of the modern French school were undoubtedly scientific and clever, the result was not really beautiful, and could not be admired by architectural students.

Mr. G. H. Jones felt sure that Mr. Harvey's system was one that gave good practical results. An arch was not always the best thing to build over a void; after all, it was a lintel bent, and, in fact, a later adaptation of the lintel principle. The most stable arch was one of segmental form having a rise of not more than one-third the span. He emphasised the value to architectural students of a sound and practical knowledge of masonry construction.

Mr. G. Goodley, as a mason, spoke highly of Mr. Lawrence Harvey's method of teaching. Mr. Harvey always insisted on working square so as to provide good square foundations, and thus avoid feather-edges.

The vote of thanks was passed unanimously, and was briefly acknowledged by Mr. Johnson.

THE SOCIETY OF ARCHITECTS.

An extraordinary general meeting of the Society of Architects was held on Thursday evening in last week at St. James's Hall, Piccadilly, W., the chair being occupied by the President, Mr. T. Walter L. Emden, J.P., L.C.C., who formally moved the confirmation of the resolutions passed at the extraordinary general meeting held on Sept. 28, proposing to alter the reading of by-laws 42 and 44, that the annual subscription should be raised from one guinea to two guineas, and that the time limit for payment should be reduced from twelve to six months—both to come into operation on Nov. 1, 1899. The Council had received, in answer to proxies sent out, a large number of replies, the proportion being more than three to one in favour of the proposed increase.

Mr. Ellis Marsland, Hon. Sec., said an amendment had been put into his hands proposing to raise the subscription from one guinea to one and a half guineas; but he did not think he should be in order in proposing it at that meeting.

The President replied that it could not be brought forward except after due notice to the Council to convene a special meeting for that purpose. The only business that night was to confirm or reject the resolutions before them. He then put the confirmatory resolution, which was carried by 19 votes to 1.

THE FIFTEENTH ANNUAL MEETING

of the Society immediately followed. The following thirteen architects were elected as members:—R. A. J. Bidwell, Singapore; F. G. Briggs, Central Buildings, Blackburn; W. Campell, 4, Bagnall-street, Hanley; R. C. Edwards, 37, Norfolk-street, Strand; C. Flint, 5, Terrace-road, Buxton; E. J. Hammond, New Brompton, Kent; H. Harrison, Newark-on-Trent; W. A. Keates, 1, Princes-street, Westminster, S.W. T. H. Pennington, Carlton-road, Worksop, A. Roberts, 10, Nelson-street, Greenwich, S.E., F. W. Richards, 14, Stanley-street, Lowestoft; Francis Witt, Colchester Avenue, Manor Park, E; H. V. Wolstenholme, Central Buildings, Blackburn; and A. W. Yeomans, Chard, Somerset.

The annual report of the Council was then read by Mr. Ellis Marsland for the year ending October 31, 1899. The Council recorded with pleasure the great progress made by the Society during the past twelve months, during which time there had been 63 candidates nominated for election as Members, of whom 51 were approved, 36 duly elected, while others awaited election on that evening. The number of nominations was very greatly in excess of the last few years, being the highest recorded in one year since the incorporation of the Society, in spite of deterrents in the shape of examinations and an age limit, showing that the action of the Council in taking further steps for insuring that none but properly qualified architects should obtain admission into the Society, had been fully appreciated. Against this four members had died, six had resigned, and four had been removed under Article 44, resulting in there now being a total of 588 members on the roll, an increase of 37 since October 31 last, and it should be noted that a number of the resignations were due to some members having taken exception to the action of the Council in raising the subscription. The question of the

REGISTRATION OF ARCHITECTS,

o which the Society had for years devoted much ime and attention, continued to occupy a considerable portion of its deliberations, and a Registration Committee had been added to the ther standing committees in order to still further identify the Society with the movement, in which greater interest than ever was being evinced, consequent on the way in which the matter had been kept before the profession and the public, not only by means of provincial meetings, of which a very successful one was held at Sheffield at the end of June, but also by the active propaganda in the Press, to which the Society contributed very largely. Every opportunity was taken of calling attention to the subject, both publicly and privately; also by reading papers at public gatherings, as at the recent congress of the Royal Institute of Public Health at Blackpool, to which the Society sent two delegates; and by taking part in discussions on the subject at meetings promoted by other architectural bodies, as at the opening of the Architectural Association discussion section this month, when the Society were represented by special invitation. Articles on the subject had also constantly appeared in the Society's *Journal*, and these had attracted the favourable notice of the architectural bodies of Quebec, Montreal, and Illinois, where registration was now in force, and the Chicago Architects' Business Association, who published a long extract from the Bill in their official journal. With regard to the progress which the Bill itself had made in Parliament, it should be borne in mind that the measure was a private and not a Government one, and that, therefore, its chance for a place for the second reading was dependent upon the ballot; but the great point was in the mean time to be preparing the way for its favourable reception when it again came up, and the Council felt that very much could be done by the members individually in this way by interesting their local fellow architects and M.P.'s in the matter, and by heartily supporting the Society at its provincial and other meetings. The Council looked forward to being able, with the assistance and co operation of the members, to largely increase the numbers of these provincial meetings, which were productive of much benefit in giving architects an opportunity of stating their opinion on the matter; and the Council would always be glad to consider invitations to hold provincial or other meetings, or to make arrangements for papers to be read before architectural and other bodies, and generally to assist in forwarding the movement in every way possible.

THE LAW AS TO LIGHT AND AIR.

Another question which the Society had taken up was the present state of the law relating to matters of "light and air," on which subject a petition was presented by the Society to the Lord Chancellor in November last, this being the practical outcome of a paper read before the Society the preceding March by Mr. A. A. Hudson, barrister-at-law, the well-known authority on these matters. In addition to this, the President (Mr. Walter Emden) had given much time to the matter and had read papers on the subject, both before this Society and at a meeting of architects at Sheffield, and which had aroused so much interest as to lead the President to accept an invitation from the Sheffield Society of Architects to address them on the subject in January next; while in connection with the recent London Municipalities Bill, the Society was to the front with a suggestion touching the "light and air" question, which was published in the London dailies and favourably referred to in the various technical and architectural publications.

MEETINGS AND VISITS.

At the ordinary meetings of the Society some exceptionally interesting papers were read by Messrs. T. W. L. Emden, Ellis Marsland, H. C. Carter, David Lyon, F. F. Scruby, Anthony Scott, and G. Gard Pye. A field meeting was held at Canterbury Cathedral on July 29. The Society also paid an official visit on May 4 to the Building Trades Exhibition at the Agricultural Hall, and on April 27 a party of the members visited the new goods warehouses of the L. and N.W.R. Co. at Broad-street. During the impending crisis in the Building Trade labour market in May, the society was approached by the London Master Builders' Association, asking for support; but, owing to the matter being settled in the mean time, no decisive action was taken beyond an undertaking by the Society to again consider the matter should occasion arise. One of the many privileges of membership was that of submitting any case that might arise in practice for the consideration and advice of the Council and Committee, and this had been taken advantage of in a manner which showed the necessity which existed for a Practice Committee.

THE TESTING OF MATERIALS.

The arrangements for the testing of materials were still proceeding, under the auspices of the Testing Committee. There was an opening for an undertaking of this kind; but, at the same time, no great progress could be expected while the hands of the Council were tied by financial considerations; but it was to be hoped, in view of the resolution lately confirmed, that this and other undertakings would be enabled to develop for the benefit of the members and the profession generally. At the Sanitary Institute Congress, held at Southampton in August, the Society was represented by Lieut.-Col. Leslie, R.E., Vice-President, and Mr. Ellis Marsland, honorary secretary, who attended as delegates. The reading-room now offered every inducement for use, being well supplied with the current technical papers, and writing materials, &c., while there was always someone in attendance to answer inquiries. The reference library had also been catalogued, and though it was not by any means so large or representative as it should be, yet it contained many useful books, and the Council would always be glad to receive additions to it, or donations to the Library fund. The Register of Employment had been found of great service in placing members and others in communication to their mutual advantage, but it was not made use of to anything like the extent which its usefulness warranted; it was quite free to members and students, while non-members were charged a nominal fee of two shillings. Two examinations were held during the session—one in April and the other in October—for particulars of which a very large number of applications were received, though, owing chiefly to the unpreparedness of the candidates, many have postponed sitting until the spring. As the examinations become better known the attendances will proportionately increase, and in the mean time the Council have every reason to be satisfied with the result of those which have been held, one successful candidate, Mr. W. A. Scott, of Drogheda, being awarded the silver medal of the Society for the excellence of his work. The Council for a long time had in view the desirability of raising the annual subscription from one guinea to two guineas, and for this purpose an extraordinary general meeting was called for September 28, 1899, at which resolutions to this effect and also for reducing the period of arrears from one year to six months, were submitted and passed. These were confirmed at another extraordinary general meeting, held that evening, the President having in the mean time expressed the Council's views on the matter in a circular letter, which had been sent to each member, and the Council were glad to acknowledge and appreciate the hearty way in which the members have supported them in this matter, and augured therefrom an increased desire on all hands to see that the progress of the Society was assured.

STUDENTS' REGISTER.

Another important matter which had engaged the attention of the Council was the Students' Register, which, on the initiative of the Secretary, had been entirely reorganised with a view to increasing the inducements of the younger members of the profession to interest themselves in the work, and at the same time securing to themselves special educational advantages, and enabling them to qualify for membership by examination under the most favourable circumstances, the following being the suggested scheme:—

Students shall be articled pupils or assistants in architects' offices, and shall be between the ages of 16 and 22, and must be nominated by a member or student of the Society, subject to the approval of the Council.

Students of not less than three years' standing having attained the age limit of 22 years, and all dues being paid, shall be admitted to the Society's examination at half-fees, and to membership on qualifying by examination without entrance fee.

Students shall pay 10s. 6d. per annum on November 1 in each year, and shall cease to be students on the 31st of October after attaining the age of 22 years, but shall still be liable for any arrears of subscriptions due.

Students shall be entitled to admission to all lectures and meetings of the Society, the use of the Society's Reference Library and Employment Register, and all other privileges of membership, except those of voting or holding office, and shall be subject in all respects to the rules and regulations applicable to the ordinary members.

Medals, certificates, and awards will be given periodically in competitions for designs, measured drawings, sketches, photographs, essays, &c.; visits to important works and buildings arranged, and facilities for sketching and measuring obtained in London and the provinces.

No student who is in arrear with his subscription will be eligible to participate in the competitions, &c.

This will, of course, entail a very large amount of work on both the Council and the secretarial department, which will be gladly undertaken, and members can do a very great deal of good by bringing the matter before their pupils and assistants. The number of students had not as yet been anything like proportionate to the number of members, though with very little effort on the part of the latter, this might easily be remedied. The Council continued: It is a source of great satisfaction and a matter for congratulation that for the third year in succession, the President (Mr. T. Walter L. Emden, J.P., L.C.C.) has allowed himself to be re-nominated for that office. In saying that he has in the past, in spite of the exigencies of a large practice and the performance of his many important public duties, devoted a great deal of personal attention to the details of the Society's work, the Council is only recalling a fact which must be well known to every member, and that he should again place his services at the disposal of the Society not only testifies to his personal interest in the work, but also to his confidence that the Society is entering upon a new era of prosperity, largely the outcome of his initiative and generous support. No one can fail to see indications not only of progress, but of very great developments in the near future. Each question taken up and each branch of the work requires continued effort, and is capable of great extension, and with increase of work comes the necessity for more support by an increase of membership. There are many men in the profession who would desire to qualify for membership were the objects of the Society brought before their notice, and it may be expected that during the coming season members will see to it that the roll is very largely augmented. The Council feel that the result of the past year's work shows that the affairs of the Society have been well administered, and that they may with confidence look forward to the continued and increasing support of the members and the profession generally.

The President moved and Mr. H. G. Quartermain seconded the adoption of the report, which was agreed to.

Mr. W. R. Mallett heartily endorsed the proposal to increase the subscriptions, and urged members to support the Society to the full extent of their powers.

ELECTION OF OFFICERS.

The President read the report of the scrutineers, which showed that 84 ballot-papers had been received (seven of which were invalid) for the election of officers and members of Council for the ensuing year of office. The officers had been unanimously elected as follows:—President, T. Walter L. Emden, L.C.C.; vice-presidents, Lieut.-Colonel F. Seymour Leslie, R.E., and Silvanus Trevail, F.R.I.B.A.; hon. secretary, Ellis Marsland; secretary, C. McArthur Butler; hon. corresponding secretary, Edgar Farman; hon. treasurer, H. G. Quartermain; and hon. auditor, W. R. Mallett. For the twelve seats on the Council there were thirteen nominations, those elected receiving the following number of votes:—C. A. Bassett Smith, 76 votes; T. R. Richards, 76; George E. Bond, of Rochester, 75; W. R. Mallett, 75; James Bartlett, 74; W. Cooper, of Hastings, 73; J. Williams Dunford, 72; R. Frank Vallance, of Mansfield, 72; R. Lano Pearce, 70; J. W. Frazer, Newcastle-on-Tyne, 69; G. A. T. Middleton, 67; and G. Gard Pye, 65.

The President, in returning thanks for re-election to the chair, expressed his indebtedness to the Vice-Presidents and Council for their hearty support, and also to Mr. Ellis Marsland, who had devoted an immense amount of time and energy to the Society's interests as Hon. Secretary, while their new Secretary, Mr. McArthur Butler, had during his year of office done much for the Society and for the improvement of its *Journal*.

Mr. H. G. Quartermain, Hon. Treasurer, and Mr. E. J. Hamilton, of Brighton, Past-President, both referred in congratulatory terms to the energy and zeal thrown into the work of the Society by Mr. Emden, and proposed a vote of thanks to the President, Hon. Secretary, and Secretary. This was cordially supported by Mr. Edgar Farman, Hon. Solicitor, as a past hon. secretary, and was acknowledged by Messrs. Marsland and Butler.

BOOKS RECEIVED.

Architectural Hygiene; or, Sanitary Science Applied to Buildings, by Banister F. Fletcher, A.R.I.B.A., &c., and H. Phillips Fletcher, A.R.I.B.A., F.S.I., &c. (London: D. Fourdrinier, *Builder* Office, Catherine-street), is a reprint of a series of articles that have appeared in the pages of our contemporary. It treats of hygiene under a variety of heads, such as "Site and Foundations," "Plan in Regard to Health and Convenience," "Sanitary Construction," "House Drainage and Ventilation," "Sanitary Fittings, Water Supply, Heating, Lighting," &c. The authors have written chiefly for students and others who think of entering for the professional examinations of the R.I.B.A., Surveyors' Institution, Institution of Civil Engineers, &c., and the notes under these several heads will be found useful. The work is well illustrated.——*The Construction of Roads and Streets*, by William H. Maxwell, Assistant Engineer and Surveyor, Leyton Urban District Council, &c. (London: St. Bride's Press, Ltd., New-street-hill, Fleet-street). This little volume will be found of service to all students about to pass the examination in the Engineering Section of the Incorporated Association of Municipal and County Engineers, for whom these notes have been chiefly prepared at the request of the St. Bride's Press. Mr. Maxwell deals with every kind of road and street construction, including road drainage, traction, and mechanical principles involved, sections and gradients, road materials, concrete macadam, tar macadam, stone brick and wood pavements, asphalte, the construction of footways, curbing, and channelling, &c. An historical sketch of road-making will be found interesting; and the student will derive instruction from the remarks on "Selection of line and levels of a new road," with diagrams illustrating Tredgold's method of surveying by rectangular lines, by which the sections are taken along the centre line of route. The bearing of geology upon road formation and construction, and the table of strata will be found useful; also the observations on rivers crossing plains and marsh ground, embankments, and cuttings, and road drainage, these being illustrated by sections. The calculation of irregular cubes necessary for calculating excavations, and the "prismoidal formula" are described, and the work is brought up to date by a series of sections of roadways. The author refers to numerous authorities and treatises on the subject, and this little manual will be found useful to all engaged in road construction, and to municipal engineers and surveyors. The by-laws of the Acts bearing on the subject are given, which make the manual a complete book of reference on road construction. The price is 3s. 6d.

CHIPS.

The town council of Edinburgh have agreed to the acquisition of about 94 acres of ground at Sughtonhall for a public park for the Dalry and Gorgie districts, at a price of £52,900.

Extensive renovations and decorations have, during the past two months, been proceeding at the Pro-Cathedral church of the diocese of Menevia at Wrexham. The work has been carried out by Messrs. Muir and Cubley, Hardman-street, Liverpool. St. Mary's church is one of Mr. A. W. Pugin's Gothic churches, and is dedicated to "Our Lady of the Seven Dolours," and this dedication has afforded to the decorators an appropriate key to the work.

Memorial stones in connection with a new Mariners' Chapel and Institute at Great Yarmouth, erected under the auspices of the British and Foreign Sailors' Society, were laid on Wednesday week.

The new Brudenell School, which has been erected by the Leeds School Board on a site in Welton-road and Norwood-grove, Headingley, was formally opened on the 19th ult. The structure, which is three stories high, affords accommodation for 1,480 children. The infants' department, which provides 480 places, is on the ground floor, and includes a babies' room for 90. The junior mixed department, where 500 children can be accommodated, is on the floor above; and the top floor is occupied by the senior mixed department, where 500 children are provided for. At the rear of the school there is a workshop for manual instruction. The total cost of the school, including fittings and site, was £21,370. Mr. W. H. Braithwaite, of Leeds, was the architect.

The partnership heretofore subsisting between W. B. Gingell and F. B. Bond, architects and surveyors, Bristol, under the style of Gingell and Bond, has been dissolved.

OBITUARY.

Widespread regret will be felt among members of the profession at the sudden death of Sir Arthur Blomfield, the well-known ecclesiastical architect, which took place on Monday night. He had returned to London that day from his country house in the picturesque Worcestershire village of Broadway, and while playing billiards at his club was attacked by syncope from heart disease, and died before medical aid reached him. Sir Arthur William Blomfield, A.R.A., M.A., F.S.A., F.R.I.B.A., whose portrait was given in our issue of June 3, 1890, was in his 71st year. He was the fourth son of the Right Rev. Charles James Blomfield, Bishop of London from 1828 to 1857, and of Dorothy, daughter of Charles Cox, and was thus the brother of Admiral H. J. Blomfield, and of the late Bishop of Colchester. He was born at Fulham Palace in 1829, and was educated at Rugby and at Trinity College, Cambridge. After taking his degree in 1851, he was articled to Mr. Philip Charles Hardwick, one of the Early Gothic school, and then the architect to the Bank of England. Soon after commencing independent practice, his ability and charm of manner, aided undoubtedly by his family connections, quickly gained him an extensive practice in all parts of the county, chiefly in the building and restoration of churches. When he left Mr. Hardwick's office, the current of the Gothic Revival was nearly at its flood, and he followed closely in the wake of Gilbert Scott, Street, and Pearson, all of whom have predeceased him, as one of the leaders of the movement. He liked best to work in the 13th century and Late 15th century phases of the style, and his designs were marked by solidity of workmanship and a free use of red brick and stone, while a certain breadth of treatment, felicity of proportion, and a richness of detail having perhaps a tendency to hardness are apparent. His works are numerous and spread over a wide area, and include such well-known buildings as the churches of St. Mary, Portsea; St. Saviour's (for the deaf and dumb), Oxford-street; St. John the Baptist, Great Marlborough-street; St. John, Wilton-row, S.W.; St. Peter and St. Paul, Upton-on-Severn; Holy Trinity, Privett, Hants; St. Barnabas, Oxford; St. James, Southampton; Glanadda, Bangor; St. George the Martyr (Albany Memorial) Cannes. He also rearranged St. Peter's, Eaton-square, Quebec Chapel, Mayfair, and the Chapel Royal, Brighton. Larger undertakings were the completion of the restoration of Chester Cathedral, and the entire rebuilding of the nave and restoration of the other portions of the fabric of the Collegiate Church (now Cathedral) of St. Saviour, Southwark, and the building of Sion College on the Victoria Embankment. Works of a different class were the Gibbs' private chapel at Tyntesfield, the Clock Tower at Liverpool, Denton Manor House, near Grantham, and the Whitgift Schools, Croydon. On the death of Mr. G. E. Street he was nominated architect, conjointly with Mr. Arthur Edmund Street, for the completion of the New Law Courts in the Strand. In 1883 he was appointed as architect to the Bank of England, and a few years later designed and carried out their branch Bank in Fleet-street. Somewhat later he commenced the Church House at Westminster, which will be his principal monument. At Copenhagen he designed the English Church, a building so much admired in that capital that he was elected, in 1887, an honorary member of the Royal Academy of Arts of Copenhagen, and received from the King the third-class of the Order of the Danebrog of Denmark. The following year he was elected an Associate of the Royal Academy, and in 1889 was knighted on the occasion of the opening of the new school buildings at Eton. At the time of his death, Sir Arthur Blomfield was one of the senior members of the Royal Institute of British Architects, having joined as a Fellow in 1867. After serving on the council for some years, he was elected vice-president in 1886, an office he held for three years. In 1891 the Royal Gold Medal of the Institute was conferred upon him, the President, Mr. MacVicar Anderson, remarking that the distinction was awarded in recognition of his purity of taste and the general excellence displayed in his ecclesiastical work. He was a past-president of the Architectural Association, having occupied the chair of that body, in succession to Professor T. Roger Smith, in 1861-2. He was twice married, his first wife being Caroline Harriet, daughter of Mr. Charles Case Smith, who died in 1882; and his second, who survives him, being Sarah Louisa, daughter of Mr. Matthew Ryan. A few years since Sir Arthur took into partnership his two sons. The elder, Mr. Arthur C. Blomfield, is the architect of Barclay's New Bank (Gosling's), now approaching completion in Fleet-street. Personally, Sir Arthur was greatly esteemed and valued by his professional brethren. His charm of manner and consideration for others won him friends, while his well-turned sentences and ready wit often enlivened discussion at the Institute. He was very willing to go into Court and support fellow practitioners by the weight of his evidence, when he thought their claim was well founded, and his punctiliousness in matters of professional etiquette set an admirable example. On one occasion within our personal knowledge we recollect a client approached him stating that he had bought a site for a country house on the Thames, but that the foundations of a residence designed by another architect existed on the ground, and asked him to complete it. Sir Arthur at once declined, remarking "Let Mr. Z. keep the commission; you cannot do better." He was an actor of considerable ability, and in earlier years frequently took part in amateur theatricals at St. George's Hall, and in drawing-room entertainments of his own composition at his residence. The funeral will take place at noon to-day (Friday) at Broadway Churchyard, Worcestershire; a memorial service will be held at the same hour at St. Mary's Church, Bryanston-square.

Mr. Henry Hockley Burnell, F.S.A., A.R.I.B.A., died on Monday last at his residence, 20, Cheyne Walk, Chelsea, S.W., aged 73 years. His name had for some years been the third on the list of Associates of the Institute of Architects—a body which he joined just half a century ago.

The interment took place on Saturday, in the Maeshyfryd Cemetery, at Holyhead, of the remains of the late Mr. William Williams, of Tonyrefail, who was the Board of Trade contractor at Holyhead. The deceased, who was seventy-three years of age, was a native of Llanrhyddlad, Anglesey, and was apprenticed to the late Mr. William Williams, Bodedern, as a joiner. He removed to Holyhead when about 19 years of age, and for some time he worked as a joiner at the Holyhead Mountain, under the late Mr. Rigby. He was then promoted to be foreman, and some years after he became manager. He was employed in the construction of the Holyhead Breakwater for a period of about 23 years, during the last twelve or thirteen years of which he acted as general manager. It was due to his ability and perseverance that the present lighthouse foundation was laid down. Year after year the foundation was washed off, but at last his energy prevailed, the work was accomplished, and the lighthouse was built thereon. The gap of several hundred yards of the breakwater, which was uncompleted to the lighthouse, was built under his supervision, and only one of the workmen lost his life during the whole of that time. Careful man in all his dealings, he would personally examine all machinery, &c., to see that everything was as safe as possible. Up to the time of his decease he was the contractor to the Board of Trade, and he carried out extensive works in connection with the mail landing pier and deepening the harbour, and also the marine blasting operations and deepening the old harbour on the London and North-Western Railway's premises, besides carrying on large building contracts in the town and country. He was a large employer of labour for a great number of years.

A new set of Westminster chimes are to be fitted to the parish-church clock, Leytonstone, by Messrs. John Smith and Sons, Midland Clock Works, Derby.

At West Bridgford, Notts, on Friday, Mr. Charles Perrin, M.Inst.C.E., sat to inquire, on behalf of the Local Government Board, into the application of the urban district council for sanction to borrow £1,500 for works of private street improvement Mr. W. Paro, C.E., surveyor, explained the plans.

Mr. W. O. E. Meade-King, C.E., inspector of the Local Government Board, held an inquiry at the Darlington Council Chamber, on the 19th Oct., to consider a proposal of the corporation to borrow over £20,000, which included £1,750 for improvement of the High-row by levelling the slope, £5,000 for the making of a new road from West-street to the southern boundary at the South End Estate, also £12,524 for works of private street improvements, and £905 for extension of the Public Library.

PROFESSIONAL AND TRADE SOCIETIES.

Glasgow and West of Scotland Technical College Architectural Craftsmen Society.—The usual meeting of this society was held at 204, George-street, on Friday, Oct. 27, at 8 p.m., when the paper to be read was "My Impressions on Glasgow Cathedral," by Mr. Alex. Wagstaff. Mr. W. F. Baxter, president, occupied the chair, over a large attendance. The essayist, in proceeding with his subject, showed by degrees how the material form of the building might be made to lead every craftsman and artist to comprehend the ideas of Ruskin and also of many of the classics, whose writings otherwise are all sealed books to the great masses of the people. He treated less of the architectural features, pure and simple, then the various evolutions which led to their own peculiar existence, and also remarked upon these buildings as indicating the height of art excellence of a community, and, as such, to be compared with similar structures of to-day, most unfavourably to the latter. He tried to draw parallels with the decline of art, side by side with social and national affairs, and gave it as his opinion that until architect and craftsmen could work harmoniously and intelligently together, our art would never attain the standard it should. He showed many points about the cathedral which he considered deteriorating, for example, the heterogeneous collection of marble monuments in the nave, and the clumsy bench seating in the choir. He clothed his remarks throughout with sketches from history, philosophy, and art criticism, all of which he showed had a very warm fellowship with buildings such as these.

Royal Archæological Institute.—The winter session of this Institute was inaugurated on Wednesday evening, at the Rooms, 20, Hanover-square, W. The chair was taken by Sir Henry Howarth, M.P., the president, who congratulated the members upon the increase in their number and the prospects of an interesting session. Two papers were contributed. The first, read by Judge Baylis, dealt with recent discoveries at the Inner Temple. In the early part of the present year the Benchers of the Honourable Society of the Inner Temple decided, he said, to increase their safe accommodation, and for this purpose excavations were commenced beneath the hall and the chapel. Under the former building an old doorway and staircase in the east wall of the inner buttery of the Inner Temple were discovered. The appearance of the doorway and staircase indicated that they formed part of the chamber occupied by the Knights Templars, which was consecrated in 1195. The walls were 5ft. or 6ft. thick. The other paper, entitled "The Sepulchral Banquet on Roman Tombstones," was read by Mr. F. J. Haverfield. A bronze celt found at Llangefri, Anglesey, was exhibited by Mr. C. Praetorius, who explained that it was turned up by the plough in 1856.

The Royal Institute of British Architects.—A deputation of the Royal Institute waited upon Mr. T. W. Russell, M.P., at the Local Government Board, to lay before him the views of the Institute on the advisability of grouping the Model Building By-Laws for non-metropolitan districts in England and Wales, with the view to the adoption of such groups, and such only as were applicable in particular localities, the establishment of a special tribunal of appeal, the extension of the London system of dealing with party-walls to the provinces, and other questions connected with the administration of local by-laws. Mr. Russell, although he could not hold out any hopes of immediate legislation on the subject, promised that the suggestions, as far as they did not involve legislation, should have the cordial consideration of the board.

A meeting of the Bristol City Council was held on Tuesday, when the Portishead Dock scheme was withdrawn.

A Local Government Board inquiry was held on Thursday, Oct. 19, at the Union Offices, Leeds, by Mr. W. A. Ducat, M.I.CE., Local Government Board Inspector, with respect to an application made by the Leeds Rural District Council for sanction to a loan of £6,750 for paving and flagging works in Old Park-road, Roundhay. Mr. Charles Lupton, instructed by Mr. J. H. Ford, clerk to the council, appeared on behalf of the council. Plans and estimates were explained by the engineer, Mr. E. J. Silcock, C.E., Leeds. There was no opposition to the application.

COMPETITIONS.

Fulham.—The baths competition at Fulham has advanced another stage. The plans are not on view yet, however, and the committee are considering the award of Mr. Frank Baggallay, the referee nominated by the R.I.B.A. The three sets of plans thus chosen will be finally brought before the council, we understand, in about a fortnight's time.

Leeds.—At a meeting of directors of the Leeds Masonic Hall Co., Ltd., held on the 26th inst., the assessor, Mr. J. Lane Fox, of Dewsbury, presented his report and award on the designs of the new buildings in Great George-street, Leeds, to cost £6,000. The directors unanimously adopted the assessor's award, which placed Nos. 4, 5, and 10 in the order of merit. On the sealed envelopes being opened, the successful competitors were as follows:—First, Mr. J. Mitchell Bottomley, Leeds and Middlesbro'; second, Mr. Clarence Coggin, A.R.I.B.A., 15, York Buildings, Adelphi, London; third, Mr. Arthur E. McKewan, A.R.I.B.A., 3, Newall-street, Birmingham.

London.—A limited competition has just been determined for the Passmore Edwards Hall of the University of London, which is to be erected on a site provided in the new street through Clare Market, now being formed by the London County Council, and next to where Mr. Justice Grantham's Institute will be built. The trustees—the Bishop of London, Mr. Sidney Webb, L.C.C., and Mr. Haldane, M.P.—have confirmed the report of Dr. Garnett, of the Educational Board of the London County Council, who was consulted as to the relative merits of the plans submitted. The competitors were Mr. Harrison Townsend, F.R.I.B.A., Mr. S. B. Russell, A.R.I.B.A. (late of Messrs. Gibson and Russell), and Mr. Maurice B. Adams, F.R.I.B.A. The plans submitted by Mr. Adams have been unanimously determined upon. The ratio of useful capacity of the chosen plans, as compared with their total cubical contents, is ·812, or 80 per cent., and the report states that "it is very seldom indeed that a building of this class can be designed with such a useful capacity as this." Mr. Passmore Edwards has given £10,000 towards the building, and its purpose is to furnish an educational branch of the University of London for the study of economic science and political economy. The present premises of the "British Library of Political Science," under the direction of Professor Hewins, are situate in Adelphi-terrace, but are quite inadequate for the work undertaken

CHIPS.

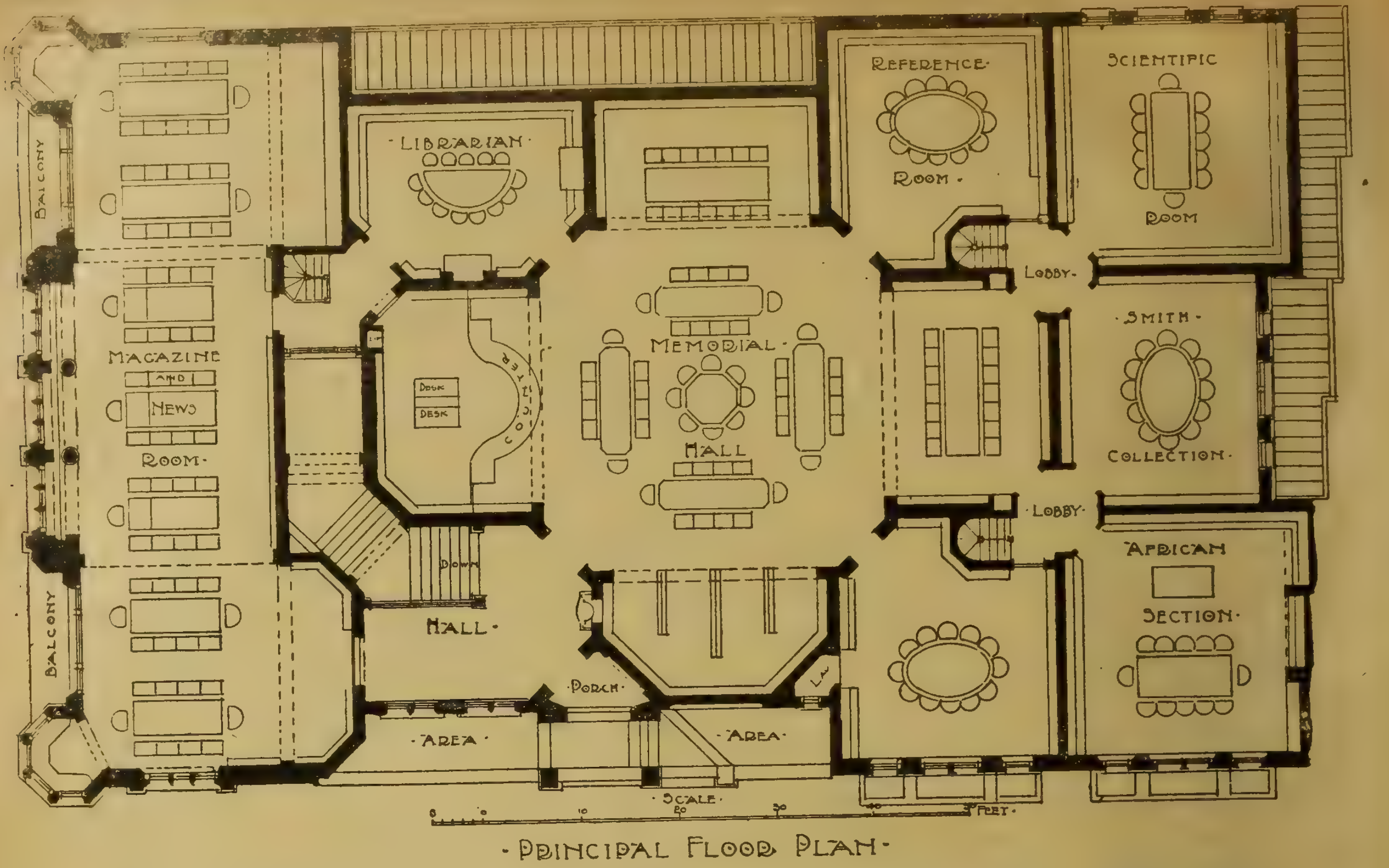
The Bishop of Worcester opened last week a large block of new buildings at the Worcester Cathedral King's School, erected at a cost of over £3,000, and including five classrooms, a science laboratory, a reading-room, and masters' room. Mr. W. H. Packer, of Worcester, was the architect.

At the meeting of the City and South London Railway Company, held on Tuesday, Mr. C. G. Mott, the chairman, stated that the company's extension through Moorgate-street was in a very forward state, and the directors hoped to open it to the public very early in December. The underground works in connection with the Clapham-common extension were nearly finished, but the stations had to be built. The directors hoped that this extension would be opened by about March.

The Bishop of St. Asaph consecrated on Wednesday at Llanrhos, near Llandudno, the church erected as a memorial to the Earl and Countess of Abergavenny. The sole cost was defrayed by Lady Augusta Mostyn, her son, Lord Mostyn, giving the site.

A new turret clock has just been erected in the tower of Upsall Castle, near Thirsk, which strikes the hours on a large bell, and shows the time upon one large external dial, with all the latest improvements invented by Lord Grimthorpe—double three-legged gravity escapement and compensation pendulum, &c. The work has been carried out by Messrs. W. Potts and Sons, clock manufacturers, Town Hall Buildings, Newcastle-on-Tyne, and Guildford-street, Leeds, who are going to erect a new clock and bell at Thornbridge Hall, Derbyshire, and one at Stickney Court, Lincolnshire.

The town council of Bury, Lancs, unanimously decided at their last meeting that Mr. Bradley, the assistant engineer, be appointed borough engineer and surveyor, in succession to Mr. J. Cartwright, resigned, at a salary of £300 for the first year, £350 for the second year, and £400 for the third, and that Mr. Ryman be appointed assistant borough surveyor at an increased salary of £25 per annum.



SAVAGE MEMORIAL HALL AND FREE LIBRARY, PORT ELIZABETH.—HENRY A. CHEERS, *Architect.*

SAVAGE MEMORIAL HALL AND FREE LIBRARY, PORT ELIZABETH.

WE give herewith the principal floor plan of the selected design for this building, by Mr. Henry A. Cheers, architect, of Twickenham, of which we gave a view and detailed description last week.

CHIPS.

The Bradford School Board have decided that an advertisement be issued for an architect, to devote the whole of his time to the service of the board, and that the clerk obtain information on the subject from other boards.

The following gentlemen have been elected officers for the ensuing year of the New York Chapter of the American Institute of Architects:—President, Walter Cook; vice-president, A. W. Brunner; treasurer, James B. Baker; recording secretary, A. L. Brockway; corresponding secretary, Charles I. Berg; executive committee, P. L. Le Brun, John M. Carrere, Richard H. Hunt, and H. R. Marshall.

Mr. W. S. Santo Crimp, of Westminster, is now, says *Indian Engineering*, in Bombay, where he is engaged in making a subsoil water survey of the city. Mr. Crimp's report will be ready (to be written) in the course of a month.

The annual meeting of the Glasgow Building Trades Exchange was held in that city on Friday, Colonel Bennet presiding. The report of the executive, which recommended a dividend of 5 per cent., was submitted and approved. In regard to the Buildings Regulations Bill promoted by the Glasgow Corporation, it was stated that the corporation had, after inviting the co-operation of the Exchange, ignored its criticisms to a certain extent. The Exchange's views, however, had again been asked on the new Bill, but if their criticisms were again ignored it would not be to the advantage of the corporation should the Bill be opposed in Parliament.

A group of Sunday-schools are being erected adjoining Annesley Wesleyan Chapel, Bradford, at a cost of £5,000.

Preston Town Council have adopted a recommendation that the overhead electric tramway system be adopted, and that Parliamentary powers be sought in the ensuing session to reconstruct the tramways on the existing routes and to construct new routes. The mayor said the lines would be of 4ft. gauge, similar to Blackburn, and as Blackburn, from point to point, was only five miles off, there was no reason whatever why, in the near future, they should not run cars from Preston to Blackburn.

A new town-hall is being built for Llandudno in Lloyd-street, from plans by Messrs. Silcock and Keary, of Bath, the contractor being Mr. R. Luther Roberts, of Llandudno.

The Arts and Crafts Exhibition Society have arranged a course of lectures by members of the Society on the Arts and Crafts movement, including the "Pre-Raphaelite School" and the "Gothic Revival," and the associated topics of Crafts and Guild Pageantry and the Masque. The lectures will be delivered in November and December, in connection with the Arts and Crafts Exhibition, now open, and will be devoted to showing the present position of the movement, its antecedents, and possible outcome. The first lecture on the Arts and Crafts movement was delivered by Mr. Walter Crane last Thursday evening.

A new Wesleyan chapel was opened at Gainsborough on Saturday. The building will hold 250 worshippers, and is estimated to cost £350.

Two stained-glass west windows were put up last week in Stretton Church, Rutlandshire, to the memory of the late Rev. Edward Bradley, better known as "Cuthbert Bede," author of "Verdant Green." They were the work of Mr. Alfred O. Hemming, of St. Margaret-street, Cavendish-square. The designs represent "Our Lord in Glory" and "The Pentecost." In the former light St. Nicholas (the patron saint of Stretton Church) is represented in an adoring attitude, with his symbol of a ship.

The first portion of the new church of Christ Church, Moss Side, was consecrated last week by the Bishop of Manchester. The old building, which was erected in 1848, having become dilapidated and dangerous, it was decided four years ago to demolish it and to replace it by a more worthy building. Mr. W. Cecil Hardisty, architect, of Manchester, designed a large and dignified edifice, and three-fourths of the whole scheme has now been completed at a cost, including a new organ by Messrs. Wordsworth, of over £9,000. The work thus far accomplished consists of chancel, chapel, vestries, bellows-house and engine for the organ, and organ-chamber. Half the nave and aisles are also finished and seated, the west end being temporarily filled by a plain brick wall.

A committee has been formed in Dublin, consisting of four members of the corporation and two representatives from each of the sanitary authorities represented at the conference, to prepare a scheme for the establishment of an isolation hospital to make provision for future epidemics of small-pox. Sir C. Cameron has been elected secretary to the committee, who anticipate an expenditure of about £25,000 on the building.

The Widnes Diamond Jubilee Committee formally handed over to the town council on Monday the Victoria Park and Recreation Ground and Victoria Promenade. The improvements have been provided at a total cost of £13,000.

On Tuesday week, Col. A. J. Hepper, R.E., an inspector from the Local Government Board, attended at the town-hall, Peterborough, to inquire into an application of the Peterborough Town Council for sanction to borrow £2,000 for works of drainage, £1,200 for purposes of sewage disposal, and £400 for a new house at Braceborough.

The Marquis of Zetland, on Saturday afternoon, laid the foundation-stone of a new church at Grangetown, near Redcar. The large Cleveland Steel Works of Messrs. Bolckow, Vaughan, and Co. have considerably increased the population of Grangetown, and the iron church built there fourteen years ago to accommodate 150 persons having proved quite inadequate for the accommodation of the churchpeople of the place, a new church, to seat 450 persons and to cost £4,500, is being erected.

In connection with a report to the Watch Committee of the Birmingham Corporation upon the recent big fire at Avery's premises, Digbeth, Superintendent Tozer pointed out that in a few minutes after the outbreak the iron girders, expanding and twisting with the heat, forced out the walls of the building. Councillor Lancaster, in presenting the report, suggested that iron pillars and girders in buildings should be covered by a heat-resisting material, and that if possible the girders should be placed in sliding shoes, so that there would be room for expansion.

The parish church of Camberworth, near Alford, Lincolnshire, was reopened last week, after restoration. The work done includes the building of a vestry, the insertion of two windows, new choir benches, and the raising of the east window. The architect was Mr. Wilfred Bond, and Mr. J. Kime, of Candlesby, was the contractor.

The model of the proposed statue to Admiral Blake, executed by Mr. F. W. Pomeroy, of London, has been approved by the memorial committee. The statue will be erected at Bridgwater.

The inauguration of the Homes for Durham Aged Miners at Haswell Moor took place on Saturday afternoon. Soon after the inception of the idea for providing homes for aged miners, the promoters had an opportunity presented to them of buying 104 cottage dwellings at Haswell Moor, vacated owing to the dismantling of Haswell colliery. Each house cost £7, and in addition the committee have expended £18 for repairs, sanitary improvements, &c., making a total of £25 per house, and a full outlay of £2,600.

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ST. PANCRAS PUBLIC BATHS AND WASHHOUSES.—CENTRAL TECHNICAL SCHOOLS, TRURO.—DESIGN FOR A WALL FOUNTAIN.—"BROOMLEY GRANGE," STOCKSFIELD-ON-TYNE.—BIRMINGHAM GUILD OF HANDICRAFT.

Our Illustrations.

ST. PANCRAS PUBLIC BATHS AND WASHHOUSES.

These baths, the design for which was selected in the recent competition, are to be built at Prince of Wales-road, Kentish Town, and will comprise four swimming-baths, 130 slipper-baths, and a public washhouse for fifty washers. The entrances are in separate roads, that for men being in Prince of Wales-road, and that for women in Grafton-road, and these entrances are again sub-divided into first and second class, with the pay-box between them in each case. The men's first-class swimming-bath has a pond 100ft. by 35ft. This bath has a gallery on all four sides, and will be used during the winter months for public entertainments, and will, therefore, come under the "theatre" regulations of the London County Council. This bath will be warmed and ventilated on the "plenum" system. The men's second-class swimming-bath has a pond of the same size. Double rooms are provided in connection with both these baths, and a refreshment-room is arranged common to both. The ladies' first-class swimming-bath has a pond 75ft. by 25ft., and their second-class a pond 50ft. by 20ft. The slipper-baths, of which there will be the large number of 130, will be of glazed fireclay, and the partitions inclosing the same will be of slate (enamelled for the first-class baths, and oiled for the second class). The public washhouse will provide 50 washing compartments, and in connection with this department there will be a crèche. The establishment laundry is placed in the basement, but with a good direct light. The boiler-house will have three Lancashire boilers 30ft. long by 7ft. 6in. diameter. The buildings throughout will be lighted by electricity supplied from the parish mains. The walls internally of the swimming-baths, slipper-baths, &c., will be lined throughout with glazed bricks. The bottoms of the swimming ponds will be paved with terrazzo. The buildings have been planned with a view to efficient and economical administration. The superintendent's office is close to the main entrance, to the principal baths, and to the committee-room. The matron's office adjoins the women's baths and public washhouse. A well-lighted administrative corridor in the basement connects all departments, and is approached from the ground floor by means of three staircases, thus providing complete intercommunication between all parts of the establishment. A towel lift will rise from the basement into each pay-office, and shoots for dirty towels will be provided from each department down into the basement, so that the moving about of trolleys, &c., will be strictly limited to the basement. The estimated cost is £57,500. The architect is Mr. T. W. Aldwinckle, F.R.I.B.A.

CENTRAL TECHNICAL SCHOOLS FOR CORNWALL, TRURO.

On October 25, in the presence of a large gathering, representative of the county of Cornwall, the Earl of Mount Edgcumbe opened the Cornwall Central Technical Schools, Truro, which have been erected, through the munificence of Mr. J. Passmore Edwards, as a memorial to the late Sir Charles Lemon, Bart., who was an ardent advocate of technical education. The building is said to be the finest monument ever erected to the memory of a Cornishman, and it certainly reflects credit on the architect, Mr. S. Trevail, F.R.I.B.A., and the committee who have been associated with him in establishing the schools. The style selected by the architect is English Renaissance of the Later Tudor period, and the prominent materials are Bath stone and Plymouth limestone. Inside the main doorway there is an outer porch, 10ft. by 8ft., divided by a teak and plate-glass screen from an inner hall, 10ft. wide, running through the building. Right and left of this are corridors leading to the physical laboratory, 20ft. by 14ft. 6in.; the main chemical laboratory, 37ft. by 20ft.; principal's room and a balance room, each 12ft. by 10ft.; general science classroom, 21ft. by 20ft.; and a domestic room, 29ft. by 22ft., for the teaching of cooking, dressmaking, &c.; and a lecture-room, 30ft. by 20ft. The first and upper floors are approached by a staircase of steel and concrete, and the flooring of the porch, entrance hall, and corridor on each floor is of Venetian mosaic. The staircase windows are in stained glass, and each comprises nine lights. The first floor contains mechanical drawing school, 29ft. by 22ft.; secretary's and committee room, 21ft. by 20ft.; and a suite of five science classrooms, 21ft. by 20ft., intended mostly for county use. There is also a suite of chambers on this floor for the caretaker and his wife. The upper floor is devoted almost entirely to the purposes of art. The chief room is an art gallery and museum, 50ft. by 20ft., containing a South Kensington loan exhibit, supplemented by local gentlemen. On the same floor are a figure and cast or antique room, 30ft. by 20ft.; an elementary art school, 29ft. by 22ft.; a modelling room, 21ft. by 20ft.; a painting room, 20ft. square; and an art master's room, &c.

NATIONAL BRONZE MEDAL DESIGN FOR A WALL FOUNTAIN.

The design for a wall fountain is to be executed in bronze, with a marble slab at the back. The bronze tablets are for inscriptions, and the motto, "Ho! everyone that thirsteth, come ye to the waters," at the top is in raised letters. The foundation is fastened to the marble slab by bolts, which are covered by a rosette of cast bronze, and is placed on the top of four semicircular steps. The troughs at the bottom are, of course, for dogs. Katherine M. Coggin.

"BROOMLEY GRANGE."

"Broomley Grange," situated at Stocksfield, Northumberland, in the valley of the Tyne, was built for Mr. J. H. Armstrong from designs prepared by Messrs. Armstrong and Knowles, of Newcastle-upon-Tyne, who have since dissolved partnership. It is built of local stone in squared rubble-work, with ashlar dressings and half-timbered work filled in with roughcasting. The roofs are covered with deep-red Ruabon tiles. The half-timbering is coloured a dark red—maroon red—the roughcasting being a warm buff, and the window frames and casements white. The general effect of colour is refined and pleasing, the natural contour and surroundings of the site lending themselves successfully to the general effect.

◆

A new Primitive Methodist Chapel in Netherfield-road, Nelson, Lancs, was formally opened on Sunday. The building, which will accommodate 576 persons, has been erected at a cost of £2,500.

It has been resolved to erect another Board School at Ponkey, Ruabon, at a cost, inclusive of alterations to present buildings, of £4,375, and the contract has been let to Mr. J. T. Jones, Cefn Mawr. Another Board School is in course of erection at Johnstown, the cost being upwards of £4,000.

Major-General H. D. Crozier, R.E., an inspector of the Local Government Board, held an inquiry at Watford on Wednesday week, into the application of the urban district council for sanction to borrow £7,500 for works of sewerage and sewage disposal, and £1,400 for works of water supply. Mr. D. Waterhouse, surveyor and engineer to the council, explained the proposals.

Engineering Notes.

Greatham-on-Tees.—Though Sir Isaac Lowthian Bell, the vice-chairman of the North-Eastern Railway Company, only cut the first sod af the new roads and railways which are to open out communication between Stockton and Greatham Creek, near West Hartlepool, on the hitherto undeveloped north bank of the river on June 2 last, the constructive work has already been commenced and considerable progress made. At Haverton Hill the laying of the double line, the requisite excavations, and the building of the overhead bridge crossing the main turnpike road at Billingham have been completed. The metalling of the 30ft. roadway from this point will be carried out as soon as the railway is sufficiently advanced to allow of the material being brought by rail. The work of laying the railways and the continuation of the road from Port Clarence to Greatham Creek has also been commenced with by the construction of a subway to connect the works of the Tees Union Salt Company with the new railway. A large number of men are employed on the work, and it is expected that the whole of the works on the north bank of the Tees will be finished by July of next year.

◆

CHIPS.

An adjudication in bankruptcy is gazetted in the case of William Henry Illingworth, of Brockley, S.E., and Westmoreland-buildings, Aldersgate-street, E.C., builder's merchant, and also in that of Richard Gould (trading under the style of Gould and Co.), Abbeville-road and Fernlea, Klea-avenue, Clapham-common, S.W., builder and contractor.

Mr. Councillor George Lamb, timber merchant, has, at the unanimous request of the Bootle Town Council, consented to fill the office of Mayor of the borough for the ensuing year. Mr. Lamb entered the council in 1894.

Memorial stones of Congregational Sunday-schools were laid at Fakenham, Norfolk, on Wednesday-week. The building will be of red brick, and its style is in keeping with the chapel adjoining. It consists of school-hall, classrooms, church vestry, pastor's vestry, scullery, and offices. Mr. R. J. Turner is the architect, and Mr. C. Tuthill, the contractor.

Messrs. Punchard, M'Taggart, Lowther, and Co., London railway contractors, have been awarded a million francs by a court of arbitration sitting at Berne for a breach of contract by the Government of the Republic of Colombia. The dispute was in reference to the construction of a railway. Legal proceedings have been going on for years in connection with the matter.

The Lancashire County Council have adopted a report and scheme prepared by Mr. Gilbert Wilson for redraining and improving the County Sessions House at Islington, Liverpool. The estimated cost is £1,200.

A subscription portrait by Professor Herkomer, R.A., of the late Mr. J. J. Colman was unveiled in St. Andrew's Hall, Norwich, last week, by Sir H. Bullard, M.P., who, on behalf of the subscribers, formally presented it to the city.

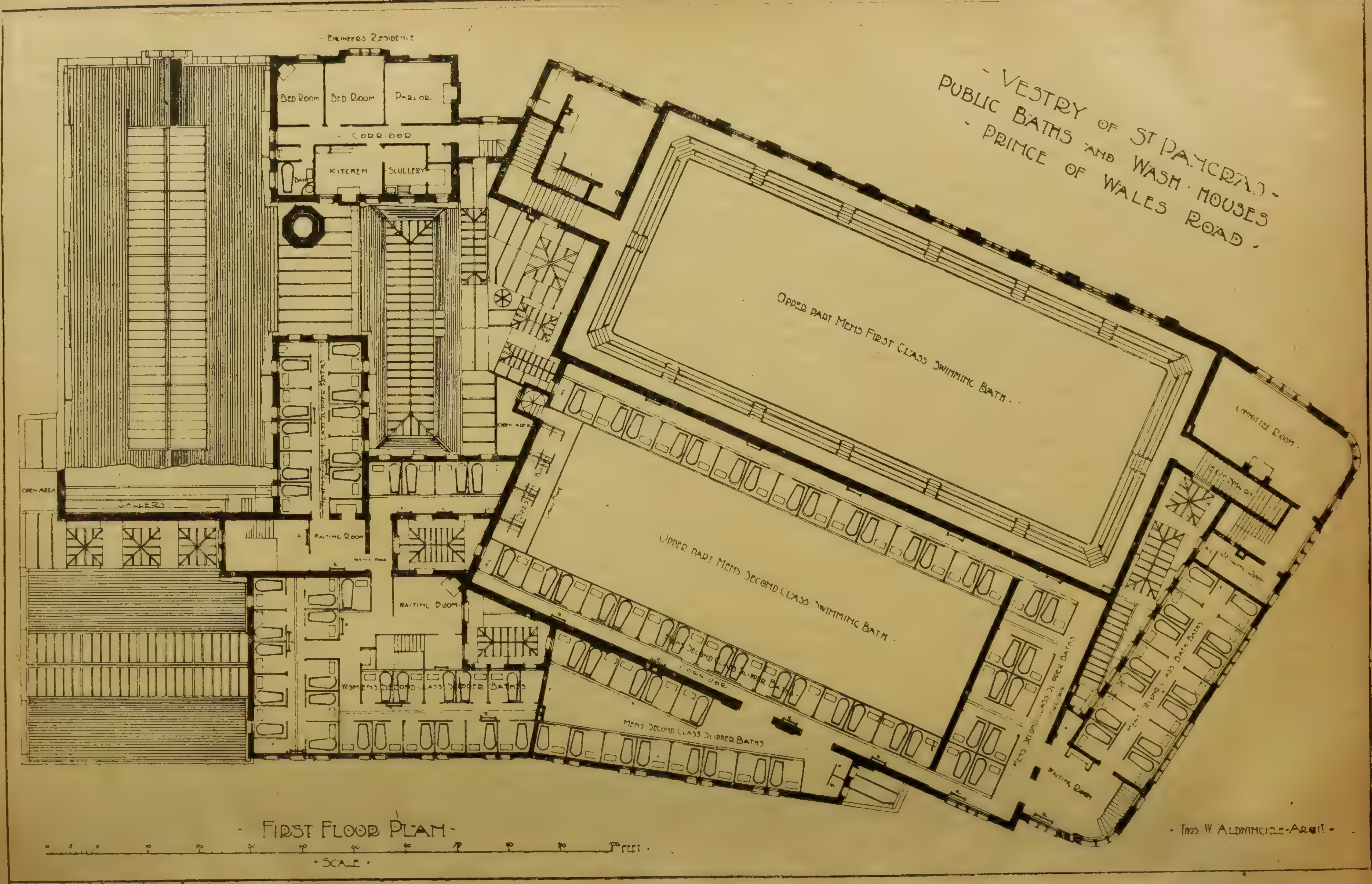
Mr. James L. Bowes, one of the leading wool-brokers in this country, and Japanese Consul at Liverpool, died on Friday. Mr. Bowes possessed a valuable Japanese museum, which he freely opened to the public, and was the author of several valuable works on Japanese pottery and enamels.

Mr. W. H. Hague Broadberry, engineer and manager of the Tottenham and Edmonton Gas Company, died on Saturday last at his residence, Elmlea, Willoughby-lane, Tottenham, aged 68 years.

The foundation-stones were laid on Saturday of a new Baptist Sunday-school at Sowerby Bridge. The new building is being erected on a site adjoining the chapel, and on its completion the latter building is to be rearranged internally. Exclusive of new furniture, the scheme will cost about £700. Messrs. Sutcliffe and Sutcliffe, of Hebden Bridge, are the architects.

Another ancient landmark at Harpenden, the Old Leather Bottle, has disappeared, and has been replaced by an up-to-date public-house. The premises have been reconstructed from plans drawn up by Mr. W. Franklin, architect, and the work of building was carried out by Mr. C. Tomlin, builder, of Harpenden. A "house-warming supper" to the builders' workmen was given on Monday week.

A new Liberal club in Hatfield-road, St. Alban's, was opened by the Hon. C. R. Spencer on Friday night. It has been built by Mr. E. Dunham, of St. Alban's, at a cost of £1,000, from plans by Mr. S. Doddimeare Edwards, of St. Alban's and Bow, E.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PUBLIC BATHS AND WASH · HOUSES
- PRINCE OF WALES ROAD -
· ENGINEERS RESIDENCE ·
BED ROOM
BED ROOM
PARLOR
CORRIDOR
KITCHEN
SCULLERY
BATH
GALLERY
OPEN AREA
WAITING ROOM
WAITING ROOM
UPPER PART MENS FIRST CLASS SWIMMING BATH.
UPPER PART MENS SECOND CLASS SWIMMING BATH.
MENS SECOND CLASS SLIPPER BATHS
CORRIDOR
MENS SECOND CLASS SLIPPER BATHS.
WOMENS SECOND CLASS SLIPPER BATHS
MENS SECOND CLASS SLIPPER BATHS
MENS SECOND CLASS BATH BATHS
WAITING ROOM
COMMITTEE ROOM.
EXIT STAIRS
- FIRST FLOOR PLAN -
FEET ·
· SCALE ·
· THOS W ALDWINCKLE · ARCHT ·

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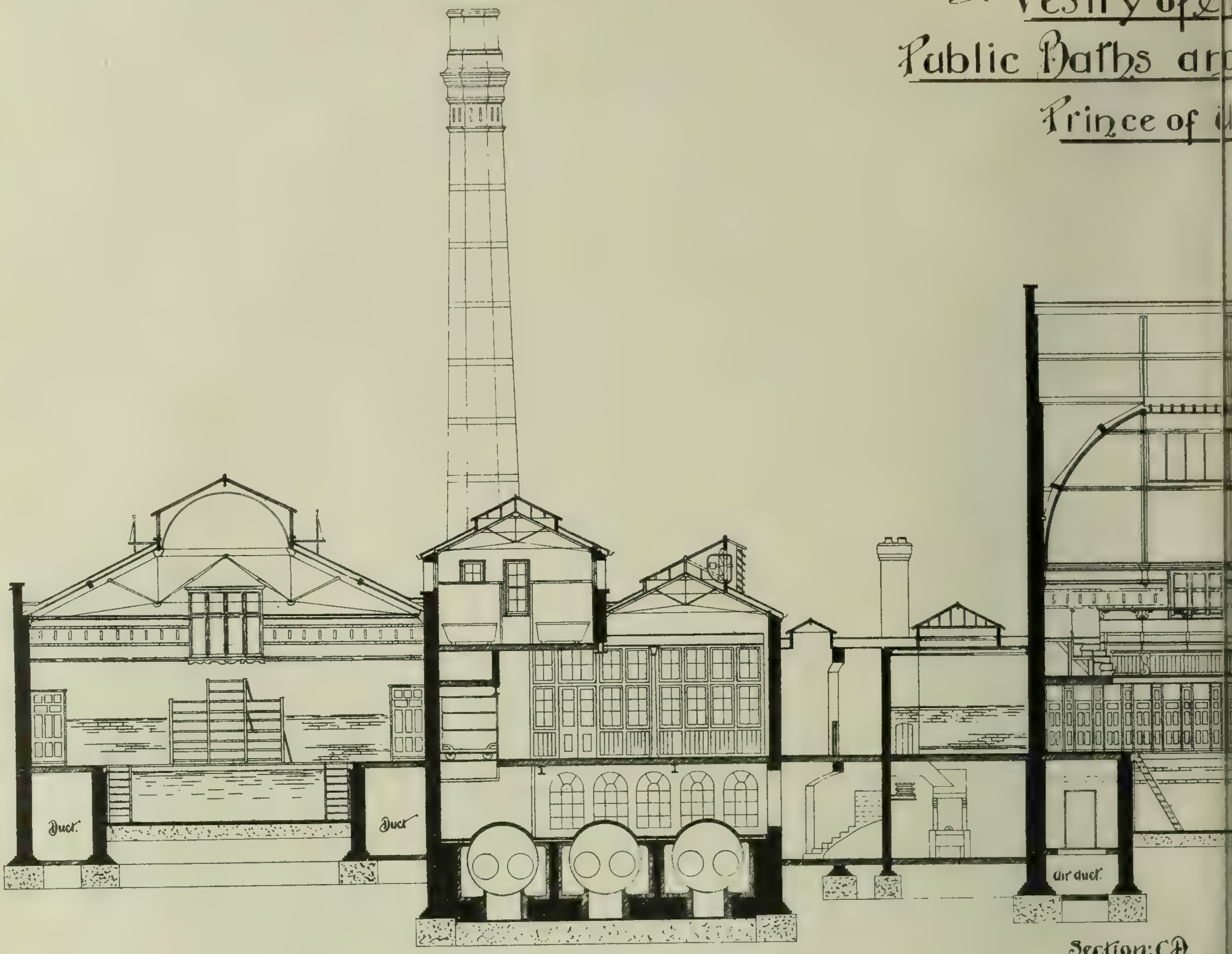

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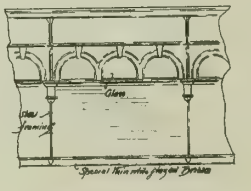

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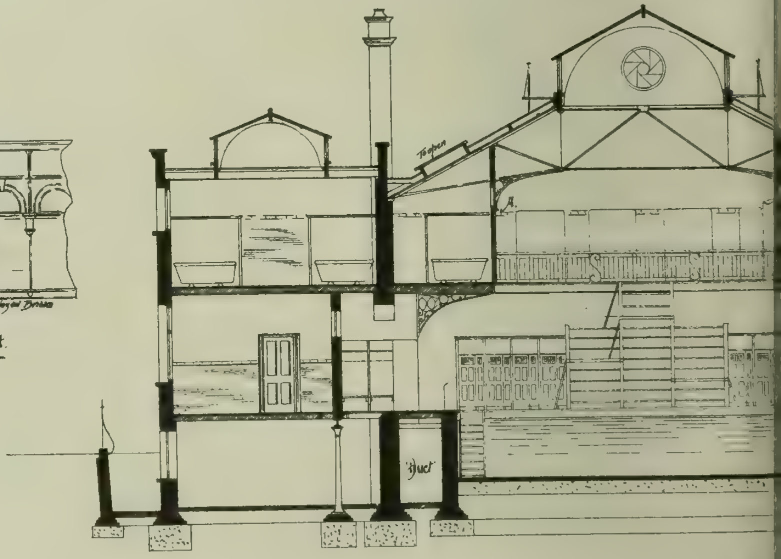

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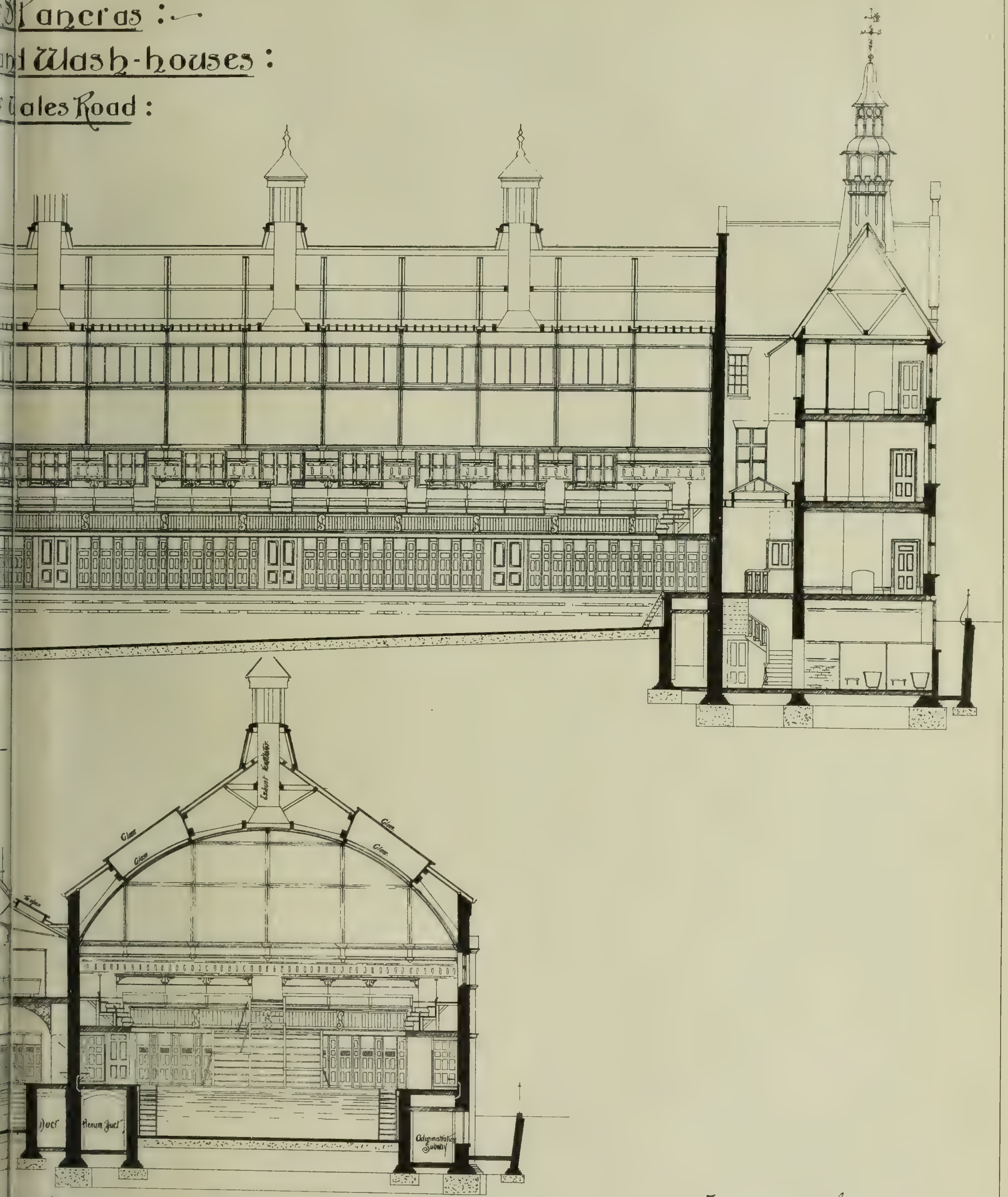

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Thos. W. Aldwinckle Arch

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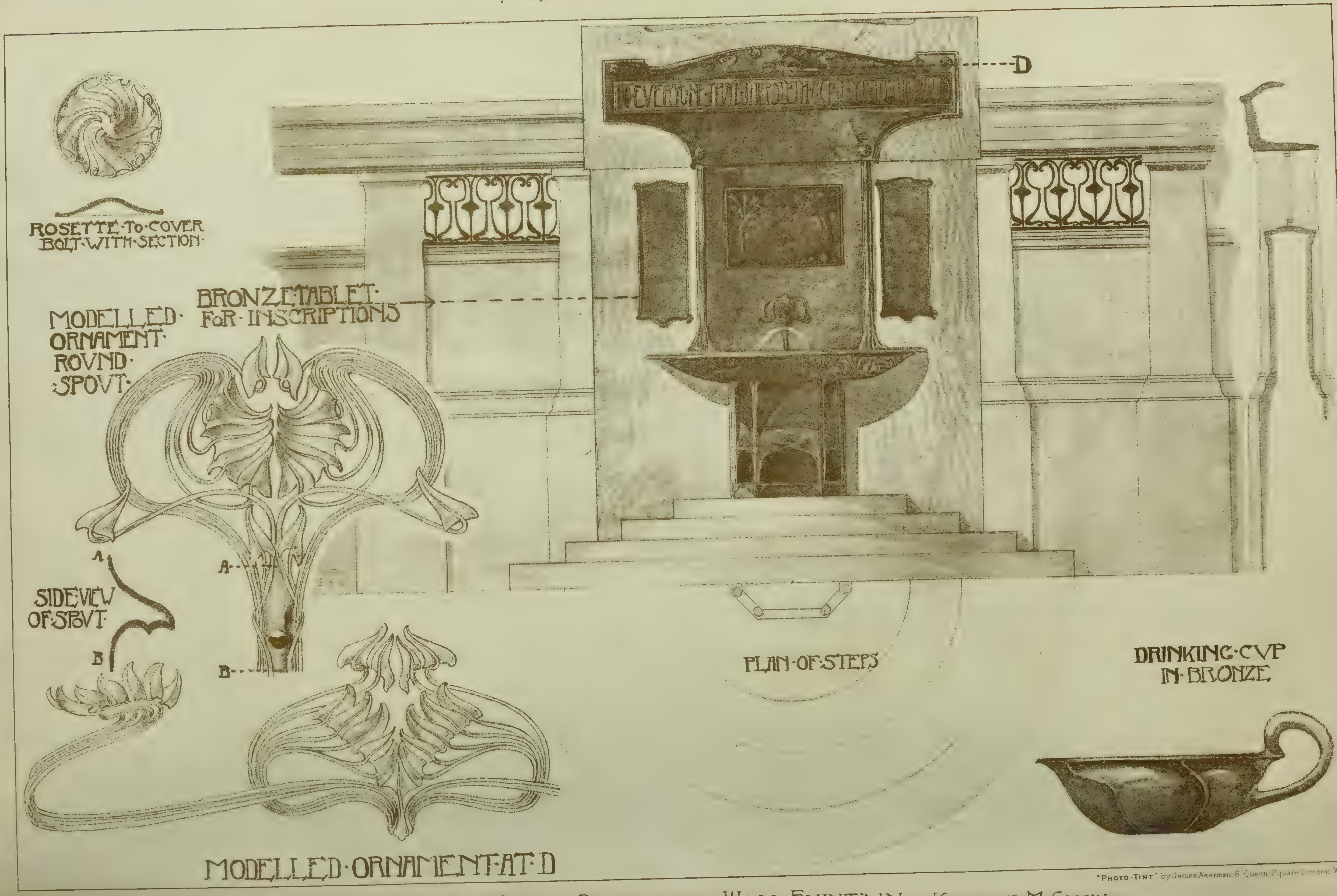
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BRONZE·TABLET· FOR·INSCRIPTIONS
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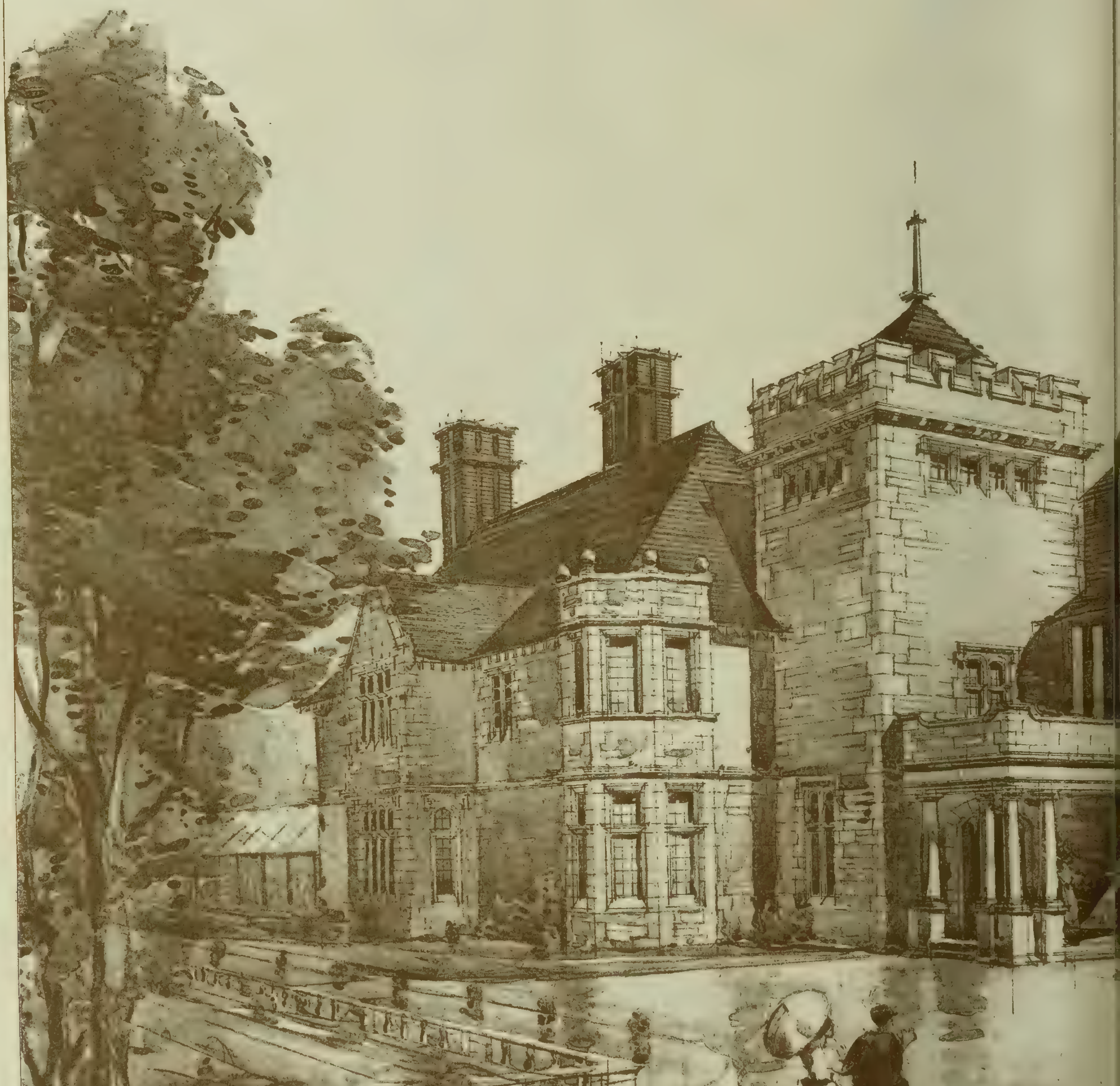
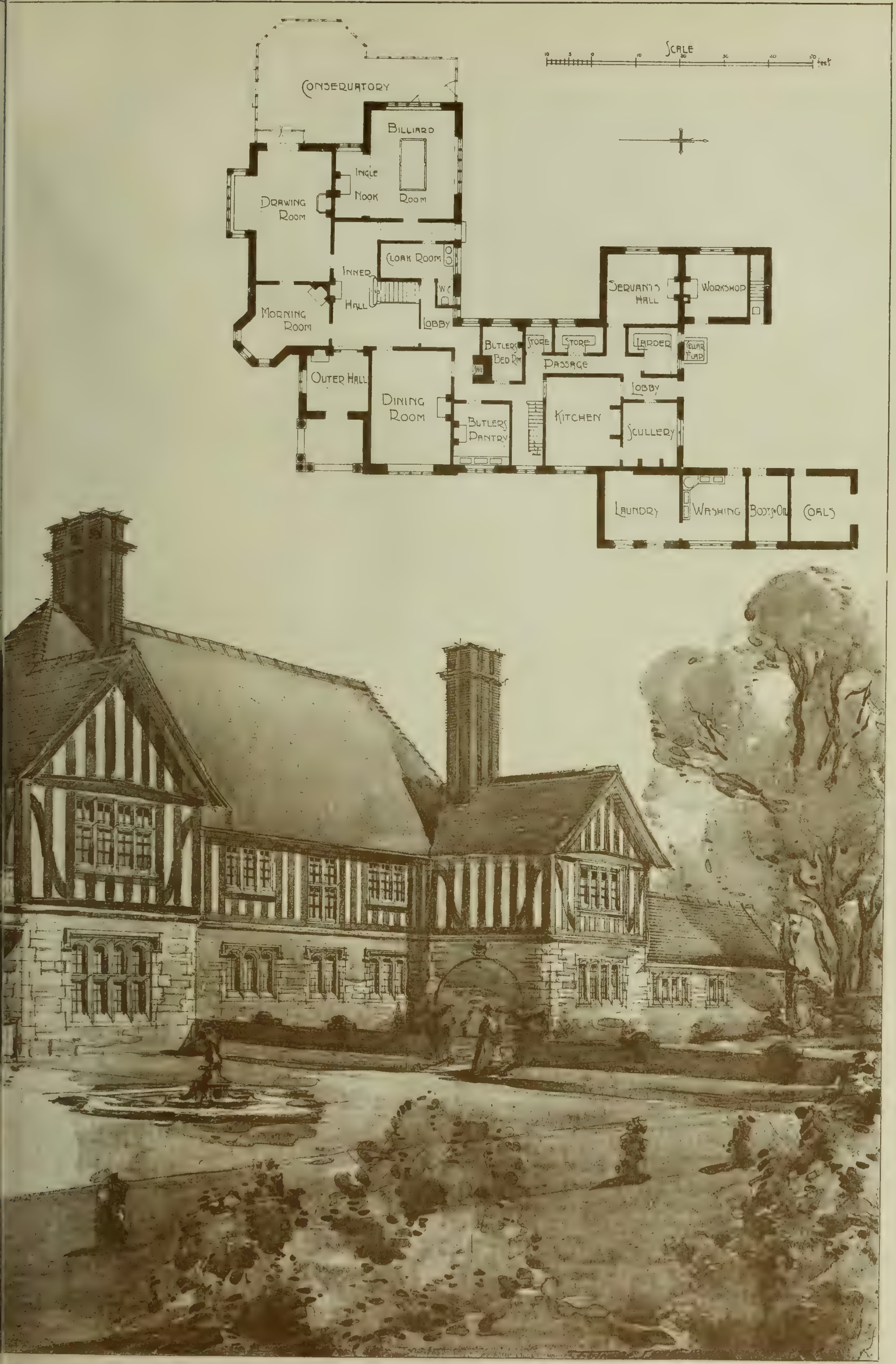
PLAN·OF·STEPS
DRINKING·CUP IN·BRONZE
MODELLED·ORNAMENT·AT·D

"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

·NATIONAL BRONZE MEDAL DESIGN FOR A WALL FOUNTAIN BY KATHERINE·M·COGGIN·

BROOMLEY GRANGE STOCKSFIELD ON TYNE ARMSTRONG AND KNOWLES ARCHTS

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Inner Hall
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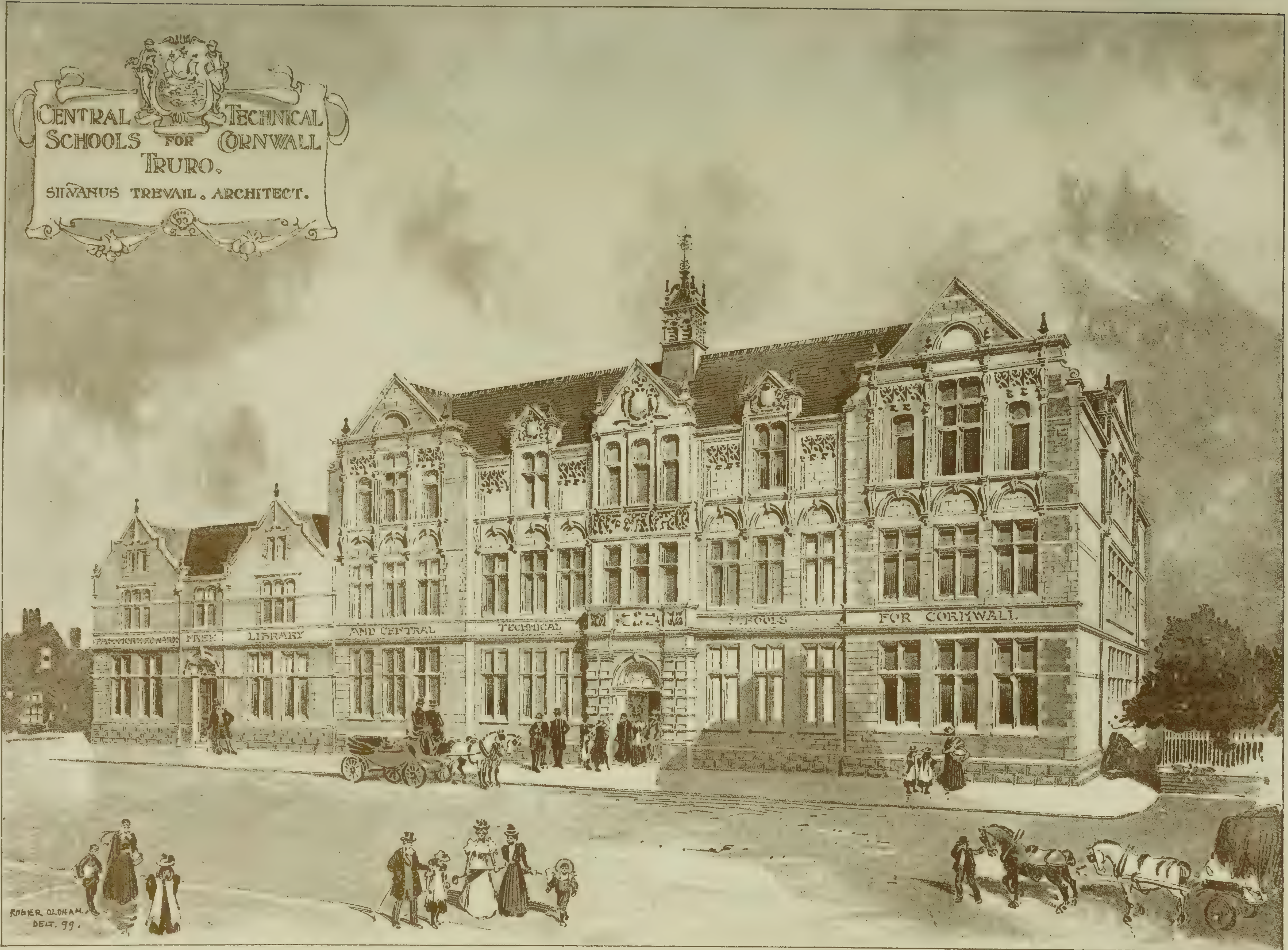
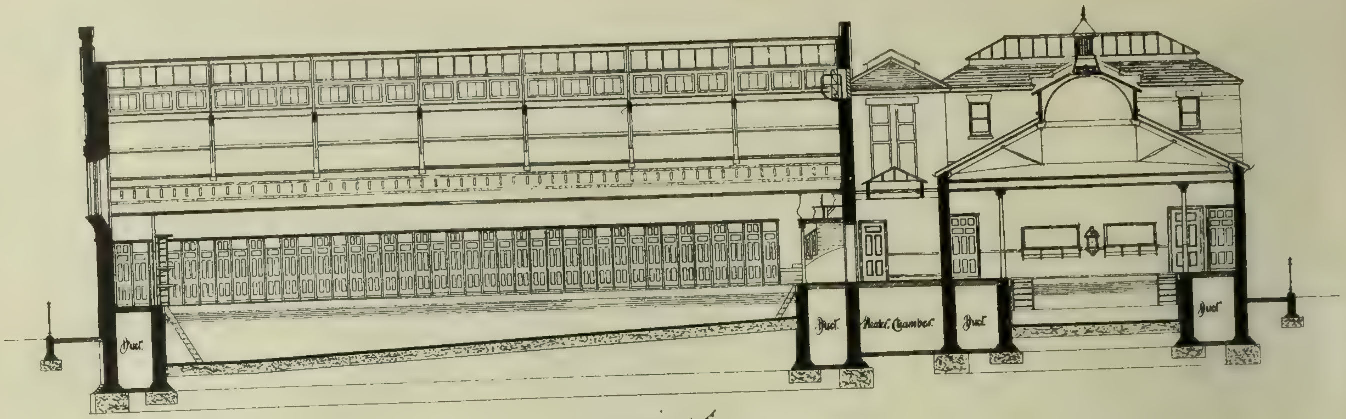
Morning Room
Lobby
Servants Hall
Workshop
Butlers Bed Rm
Store
Store
Larder
Cellar Flap
Passage
Outer Hall
Lobby
Dining Room
Butlers Pantry
Kitchen
Scullery
Laundry
Washing
Boots & Oil
Coals

"PHOTO-TINT [illegible]


CENTRAL TECHNICAL SCHOOLS FOR CORNWALL
TRURO.
SILVANUS TREVAIL, ARCHITECT.
PASSMORE EDWARDS FREE LIBRARY AND CENTRAL TECHNICAL SCHOOLS FOR CORNWALL
ROGER OLDHAM, DELT. 99.

THE PASSMORE EDWARDS BUILDINGS; (LEMON MEMORIAL) TRURO.

"PHOTO-TINT," by James Akerman 6 Queen Square London W.C.



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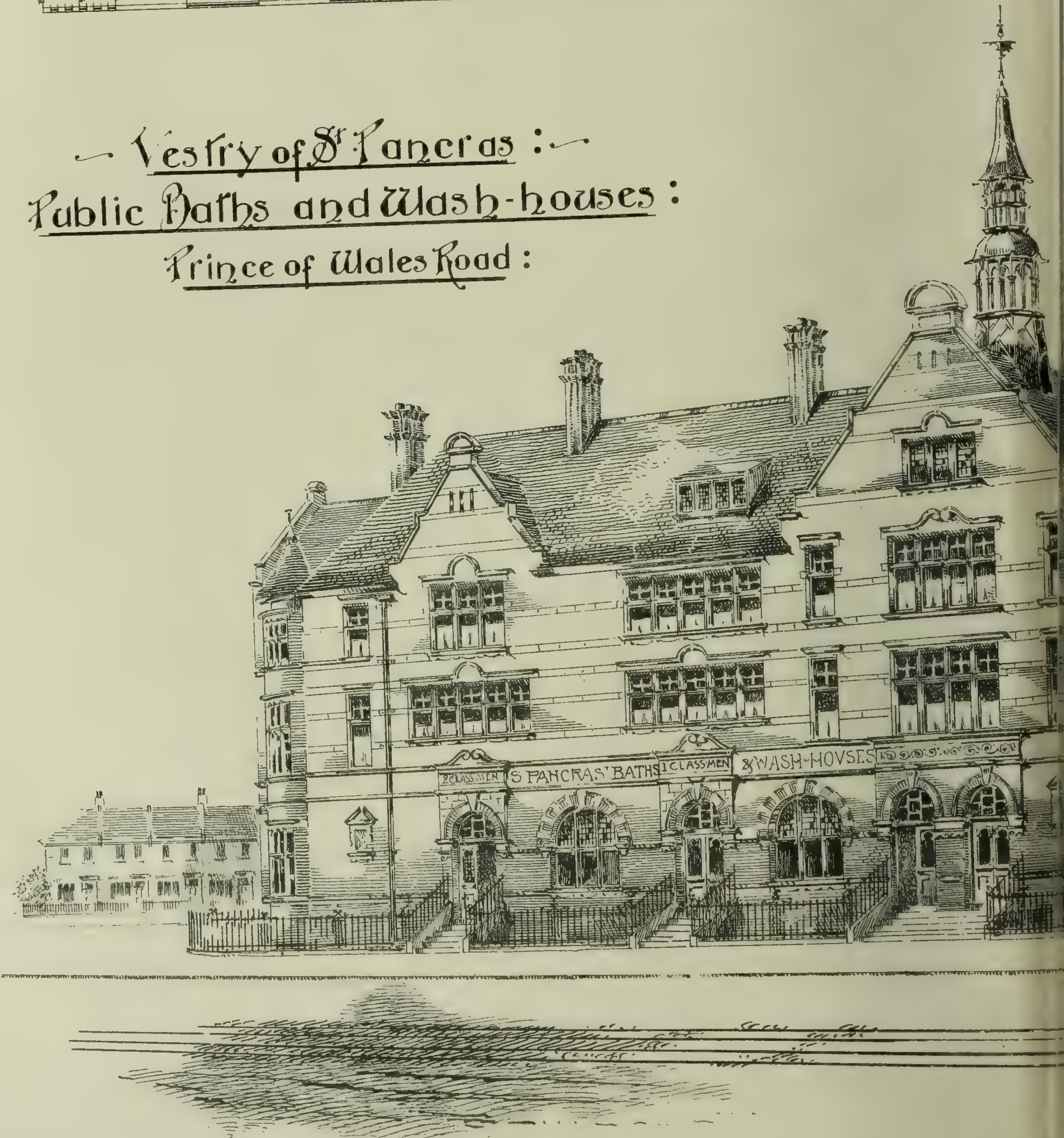

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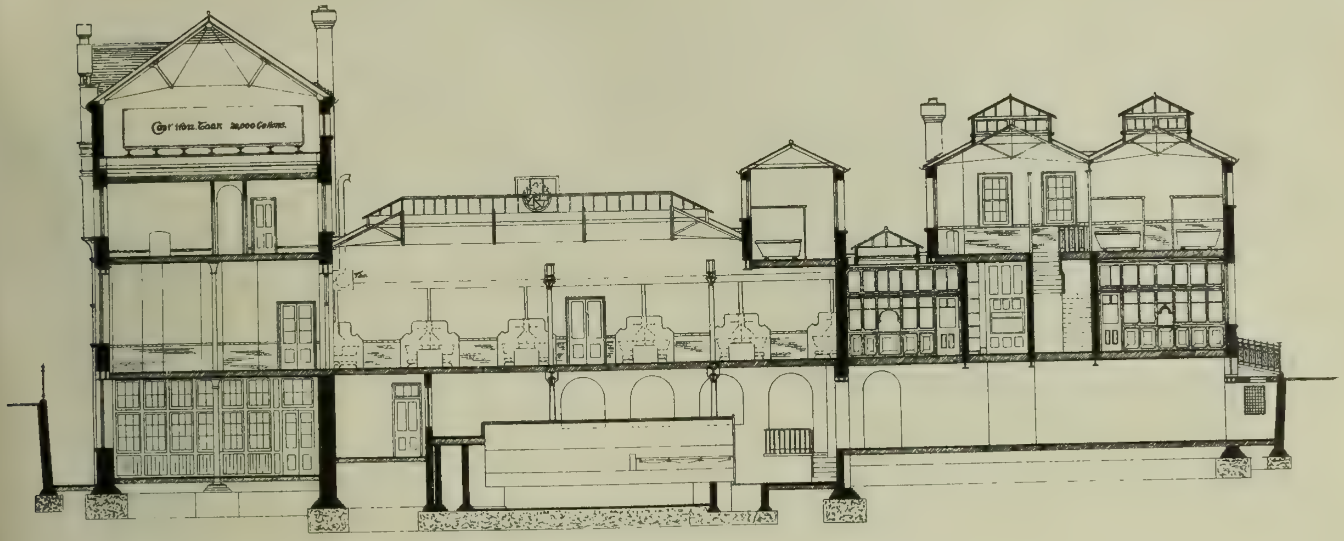
Public Baths and Wash-houses:
Prince of Wales Road:



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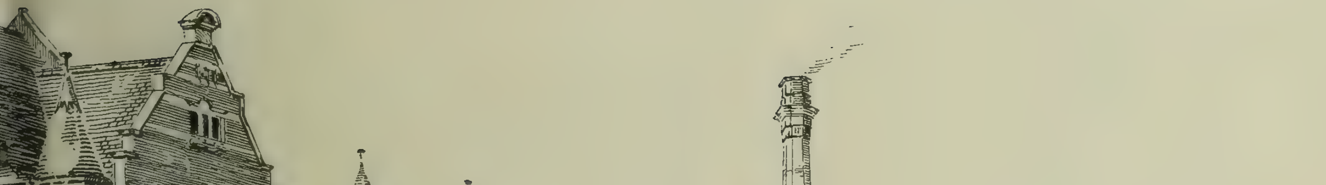
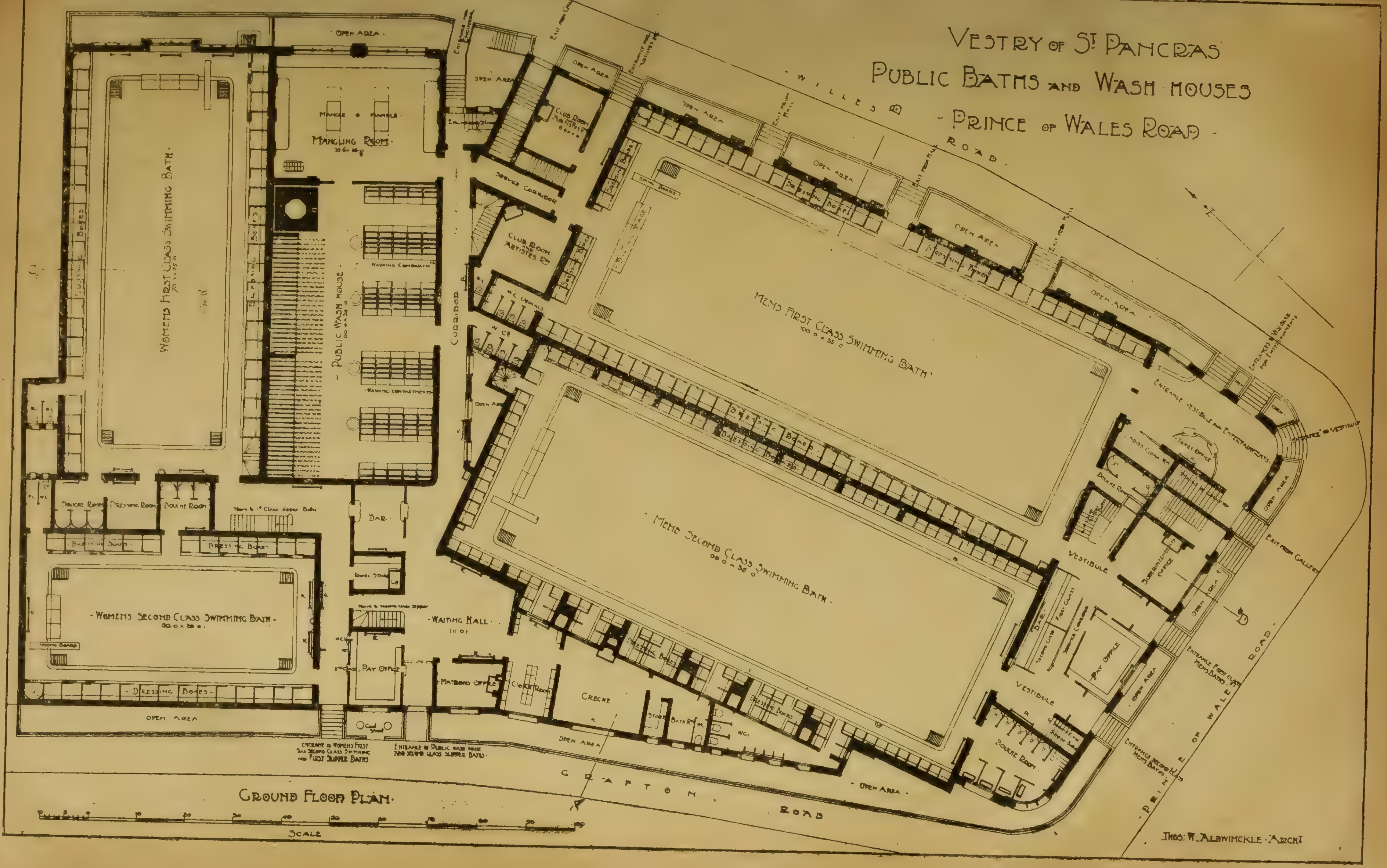


Thos. W. Aldwinckle Archt

Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C.



VESTRY OF ST PANCRAS
PUBLIC BATHS AND WASH HOUSES
- PRINCE OF WALES ROAD -

GROUND FLOOR PLAN.

THOS: W. ALBWINCKLE - ARCHT

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—H. and G.—A. Co., Ltd.—J. H. and Co.—J. G.—A. C. and Co.—M. R. Co.—D. and D.—Barbell. —V. de T. Co.—D. S.—P. P. and Co.—E. F. and B.

F. N.—We have written you. Hart, Son, Peard and Co., Drury-lane, could make it for you.

Draughtsman.—The fault is in the tracing-paper. We found the same. The ink lies on the surface, and reflects the light like a looking-glass.

Paratus.—Nothing better, in such a case, than Dent and Hellyer's cast lead "Anti-D traps."

Local Surveyor.—In your district the Moreton Sand and Gravel Co. supply a very good filtering sand. Write, the Secretary, Joseph Pettyfer, Moreton Station, Dorchester.

Ceiling.—Have you seen "Cameoid," the new material made by F. Walton and Co., 1 and 2, Newman-street? It is much cheaper than plaster, and works well either for high relief or low relief.

"BUILDING NEWS" DESIGNING CLUB.

SECOND LIST OF SUBJECTS.

B.—A Bungalow Club on an elevated site in the country, not far from the seaside. It is intended for visitors' use mainly in the summer, and the site itself is flat, with terraces leading up to it, the hill rising to the north-east behind. The main frontage will overlook the S.W. The accommodation is to provide for a club reading-room, 30ft. by 20ft., or of that area, a billiard-room for two full-size tables, a ladies' drawing-room 18ft. square, or of that area, and a card-room 18ft. by 14ft. There is to be a general meeting room, 40ft. by 25ft., and a stage adapted to theatrical performances beyond; but this is not to be too large. Two retiring or dressing-rooms in this connection are required. The entrance hall of the club must be roomy, and serve as a crush-room on evenings of entertainment. The card-room to be then available as a ladies' cloak-room. A gentlemen's small cloak-room, with lavatory and conveniences beyond. Upstairs there must be a steward's flat of four rooms and offices. A wine cellar on a small scale in the basement. Style, brick and timber, with shingled roofs. Plans, two elevations, one section, and view. Elevation ⅛in. scale, plans $^{1}/_{16}$in. to the foot.

Drawings Received.—"Apteryx," "Tyro," "Speys," "Jove," "Anthony," "Birkie," "Go Bang," "E. D.," "Derbeian."

Correspondence.

SALT WATER AND CEMENT.

To the Editor of the Building News.

Sir,—I read with much interest your abstract on "The Effect of Salt Water on Cement," by A. S. Cooper, as published in your issue of the 27th ult. There are, however, a few points upon which perhaps some of your correspondents might be able to throw a little light, for the benefit of many readers, who, like myself, are not acquainted with American and German civil engineering practice.

In the first place, a "German hammer machine" is mentioned for ramming cement into briquette moulds. The mixing was done by means of a "Riehlé mixing machine," and the samples were broken on a "Fairbanks tension machine." I should be glad to know where particulars and descriptions of these appliances may be obtained.

Any information as to the chemical analysis, properties, and general purposes for which the "Hemmoor" and "Beach's" cements are used would also be acceptable.—I am, &c.,

H. Busbridge.

MISCELLANEOUS PRACTICE.

Sir,—One cannot help appreciating the open manner in which the leading article in your issue of the 27th inst. treats of the position of architects and architecture. It has been, and is, exceedingly difficult to realise the construction that would be placed by the public on architects (registered). The article clearly shows, and rightly, that no man is able to "Design in Beauty, Build in Truth" any building in either the Classic or Gothic styles in any period, and have the leading features of decorative design at his finger-tips, together with a complete knowledge of all the various materials used in construction and decoration. Is it not the possession of all these qualities that the public would be led to expect if registration were adopted? Is it not a fact that, being registered, an architect would not be debarred from taking more work than he could personally attend to, with the result that practically the same state would prevail as at present—the employment of others not necessarily registered, and whose names would not appear? Registration is purely a personal matter, so that if registration be adopted, then all work from the architect's office must be that of his own hands; otherwise the public is deceived. There is undoubtedly a great need for a qualifying examination to help and guide those who are entering the profession as students, in place of the present pupil system. One would imagine that, having the welfare of architecture at heart, there should be less talked of registration and more for the necessity of the unanimity of working of the various societies having in view the establishment of an Academy of Architecture, with its museums, libraries, and workshops, where not only design, but all the trades, would be taught, and of which an associateship or fellowship could be obtained by examination.

It would be more intelligible to the public if a man could show he belonged to an Academy of Architecture than if he simply called himself architect, for what does the term imply? I do not recollect ever having heard it satisfactorily explained, although it has often been brought up. If it means a master builder, the term is singularly misapplied in the present generation, because the master builder is not recognised as an architect. Ladies are now being admitted as architects, and as one cannot imagine ladies climbing about buildings and superintending building operations, one is led to believe that the architect exists only on paper.—I am, &c.,

October 31. M. W. M.

Lady Alice Havelock-Allan has caused to be placed in St. Cuthbert's Church, Darlington, a tablet in memory of her late distinguished husband Sir H. Havelock-Allan. The tablet is of alabaster on a black marble ground.

The first examination for certificates of qualification for appointment of sanitary inspector, under section 108 (2) (*d*) of the Public Health (London) Act, 1891, will be held in London on Tuesday, Dec. 5, 1899, and the four following days. Particulars will be forwarded on application to the hon. secretary, Mr. Wm. R. E. Coles, 1, Adelaide-buildings, London Bridge, London, E.C.

Intercommunication.

QUESTIONS.

[11358.]—**Ebony.**—Can any of your readers inform me, through the medium of your paper, where I can obtain ebony 9ft. 6in. long by 1¼in. square? I have been unable to procure it in this district.—A. Waddell, Burntisland.

[11359.]—**Heating.**—Will someone versed in heating and ventilation describe how the requirements of heating a public lecture room can be found, and the rule for determining the necessary change of air, say, three times in one hour, the glass and wall surface, ventilation, the size of outlets and inlets, &c.?—A Student.

[11360.]—**Calculating Weight of Castings.**—I should like to know of any expeditious method of obtaining the weight of a cast-iron column with cap and base? Also of stanchions of the usual form? Is there any table giving approximate weights for certain diameters, and sizes? All the books I have consulted say nothing about weight of the castings themselves, but only deal with the external loads.—Subscriber.

[11361.]—**Frontage.**—Is there any regulation as to setting back the frontage line of houses from the old boundary? In many public roads built on recently, while one house is allowed to come forward to the old line, another has been set back several feet. There are several such cases in the Brixton Hill-road. How are these anomalies explained?—T. T. S.

REPLIES.

[11342.]—**By-Laws.**—As I understand this case, "J. O." has pulled down a building, and intends to erect another on the site. Having taken down more than half the cubical contents, the new building must be in accordance with the by-laws; but if the frontage of the proposed new building is in a line with the general line of buildings in the street, I should be very much inclined to fight.—H. L.

[11343.]—**Angles, Light and Air.**—I do not know where "Provincial Surveyor" heard of the angles quoted. Section 41 sub-section 3 (*d*) an angle of 63½° is used in connection with the open spaces in rear of domestic buildings in the London Building Act, 1894, and in the same Act roofs of domestic buildings must not exceed 75°, and warehouse buildings 41°.—H. L.

[11346.]—**Ants.**—A very reliable authority once told me that the only remedy was carbolic acid in boiling water poured wherever ants or their eggs are likely to be found. Turpentine and paraffin have been used in other cases.—H. L.

[11347.]—**Protection of Adjoining Walls.**—If "S. E. B." is raising his ground above the former and ordinary level, it would be well to arrange with the adjoining owner for the formation of a vertical damp-course.—H. L.

[11349.]—**What to Charge.**—"Ignoramus" does not state whether the four cottages are exactly alike. It is well in such cases to keep a careful account of the time occupied, as a pencil drawing with a linen tracing for the local surveyor will probably be all that will be required. —H. L.

[11349.]—**What to Charge.**—If the plans have been prepared for a client, and are to obtain approval of a surveyor, I should charge 2½ per cent., though I daresay many would charge 1½ per cent., there being no elevations. A plan involves the main study in a case of a cottage, and should be paid for.—G. H. G.

[11351.]—**Colouring Plans, &c.**—"Improver" will find the practice vary in different offices. Stone may be sepia, light blue, or raw umber; paving, light Payne's grey; brickwork, light red; tiles, Venetian red; unwrought fir, yellow ochre; wrought fir, burnt sienna; oak, warm sepia; slates, indigo; plaster, Payne's grey; iron, Prussian blue; concrete, mottled grey; cement, burnt umber.—H. Lovegrove.

[11352.]—**Legal.**—In the absence of a clear definition, I should conclude that the pupil must not reside or have an office within five miles of his late master's town. —H. L.

[11352.]—**Legal.**—The "five miles" means the place of office. No one could prevent a client coming to an architect who lived within that distance. The latter question is certainly ambiguous—viz., "Does it mean that the building I put up must stand outside that radius?" I should say not.—Owen.

[11353.]—**Dispute.**—In cases of this kind tenants should not be thought of until the contractor has quite finished his work, and I consider that he is right.—H. L.

[11354.]—**Packing for Hot-Water Taps.**—In reply to "Plumber," if he will substitute asbestos for his present packing—either cored or loose—he will find that this will put an end to the trouble he has experienced with leaky glands.—A. A. M.

[11357.]—**Damp.**—Creepers do not make a wall damp, as the leaves protect the walls. It is useless laying a floor with wood blocks, unless all water is carried off, and the wall protected from earth by a vertical damp-course.—H. L.

The new premises of the National Telephone Co., Ltd., Bristol, have been fitted with an entirely new installation for the complete warming and ventilation by Messrs. John King, Ltd., engineers, Liverpool, by means of their "Rajah" ventilating radiators.

A remarkably high price for City property was realised at the sale last week by Messrs. Douglas Young and Co., at the Mart, of a freehold site at the corner of Fen-court and Fenchurch-street, covering an area of 560 superficial feet. The price given was £10,700, a little over £19 per square foot.

Building Intelligence.

Baldovan, N.B.—A new asylum for imbecile children is being built facing the Dighty Water at Baldovan. The building in course of erection will form the central block of the completed institution. The frontage will then be 155ft. in length, and in three heights, three stories in the centre, two stories adjoining, and only one story at the extremes. Under the base course the walls will be of bull-faced ashlar, above this course of square rubble, with angle scabbed hewn work. The upper stories will have dormer windows, and the roofs will be pavilioned. A flight of steps lead up to the main entrance, which, along with the three light bay windows on either side, stands out some 4ft. from the line of wall above, and is surmounted by a parapet wall, having moulded coping, the whole length forming a balcony. A vestibule, 8ft. wide, runs through the depth of the building, and connects to a corridor running lengthwise, giving access to the different rooms. Three day-rooms, boys' and girls' hospitals, matron's room, board-room, doctor's room, and sanitary and other offices occupy the ground floor. The floors above are chiefly occupied by bedrooms and dormitories. At the rear of the front building, and separated from it by a 6ft. wide corridor, will be another building, one story in height, containing the dining-hall, 71ft. by 32ft., kitchen, a servants' dining-room, several storerooms, baths, a mortuary, and offices. The boiler-house, with a 50ft. chimney-stalk, occupies the rear. The entire length from front to back is 180ft. The heating and ventilation will be effected by hot-air flues. The mason work is in the hands of Mr. William Bennett. The other contractors are:—Joiner work, A. Bruce and Son; plumber work, Messrs. Farquharson and Sons; slater work, Messrs. James Laburn and Son; and plaster work, Mr. James Laburn. Mr. William Dick, Downfield, is clerk of the works; and Messrs. James Maclaren and Sons, Dundee, are the architects.

Bristol Cathedral.—The new reredos, erected as a memorial of the long connection of Bishop Ellicott with the united diocese of Gloucester and Bristol, was unveiled on Friday by the Archbishop of York. The reredos has been carried out at a cost of £2,500 from the designs of the late Mr. J. L. Pearson, R.A. The structure is of stone; it is upwards of 17ft. wide, and rises to a total height of 27ft. from the floor of the sanctuary. The lower part behind and above the altar is plain, with a tall centre panel to inclose the altar cross, and on either side of the upper half of this panel is an enriched arcade of five divisions. Above this lower part the centre portion (which takes the width of the altar, and is about 10ft. wide) is corbelled forward, and to the right and left there are enrichments from the floor upwards of traceried panelling, surmounted by niches with figures of Biblical saints. Above the level of the top of the corbelling the reredos contains niches, the central one having the Crucifixion, with Saint Mary and St. John. The lower part of the back or eastern side of the reredos is richly panelled to a height of 14ft., and above this it is divided up by buttresses with niches. A panelled and traceried screen separates the eastern bay of the choir from the eastern chapel, flanking the reredos on either side. Among the figures represented are those of bishops connected with the See of Bristol, including Drs. Butler, Trelawny, and Ellicott. In front of the reredos stands an altar table of carved oak, surmounted by a marble slab, and approached by three steps. Mr. Nathaniel Hitch was the sculptor.

Dublin.—Within the last few weeks great improvements have been effected in the floor of the central hall at the City Hall, Cork Hill. The worn-out Portland stone pavement has been removed, and a concrete bed laid down, upon which has been fixed a marble and mosaic floor. The centrepiece is composed of ceramic tile mosaic, in which the ancient coat of arms of Dublin has been introduced. Outside this the floor is of marble, composed of black and green rings of Connemara marble interlaced with Cork red. The filling is made of Sicilian marble octagons with black marble squares, and bordered with rings of tile mosaic. The border outside the columns is of green circles, and in front there is Cork red filling, with Sicilian plinths in remainder of circle. The panels between the pillars are of black borders with green filling, and the remainder of the floor next the walls is of square Sicilian marble slabs. The panels of the principal doorways are filled with Sicilian octagons and black marble squares, and the front entrance-hall is of similar filling of marble as the main hall. The portico is laid with Portland stone octagons with black dots sufficiently thick to stand the traffic, and which is in keeping with the stone in the building. With the exception of the Sicilian work, all the marble has been quarried in Ireland. The contractors are Messrs. H. Sibthorpe and Son, Molesworth-street, Dublin. The designs were prepared by Mr. C. J. M'Carthy, city architect, under whose supervision the work has been carried out. Mr. P. Bride was the clerk of works.

Edinburgh.—The opening of the new electric-lighting station in M'Donald-road marks the latest step in the municipal electric-lighting scheme in Edinburgh. When completed it will be capable of holding between 30,000H.P. and 40,000H.P. At present only about 5,000H.P. are put down, but this will be increased from time to time as required. In plan the station will consist of two engine-rooms, each holding 15,000H.P. to 20,000H.P., and four boiler-houses, two for each engine-room. At present only one of the engine-rooms and one of the boiler-houses are built. The others will be added later (structural provision being made for this) as the demand for light increases. The corporation has reduced the price of current to consumers as they found the cost to themselves becoming less, and the average price received for current to private premises is now just 3d. per unit, the lowest in the country. The arc lights in the Edinburgh streets have been carried further than probably in any other city. There are now 744 lamps in the public streets, and the policy has been adopted of lighting properly, not only the best, but also the poorest streets. The station buildings have been designed by Mr. John Cooper, the burgh engineer; Mr. F. A. Newington, the resident electrical engineer, has had charge of the engineers' work on the spot; and the scheme has been designed throughout by Professor Alexander B. W. Kennedy, F.R.S.

Hadley, Salop.—New buildings are in course of erection on the site of the old Castle Ironworks at Hadley (formerly occupied by the Nettlefold Company), where Messrs. G. F. Milnes and Co., Limited, of Birkenhead, will manufacture electric tramway and light railway cars, and employment will be provided for 500 or 600 people. The buildings and machinery will necessitate an expenditure of over £100,000. Thirty acres of land have been purchased by the company. At the entrance to the works will be a suite of offices for 15 or 20 clerks and managers of departments, and offices for 15 draughtsmen. The office-keeper's house will be above. The car-shed will be 500ft. by 150ft., and divided into seven bays, where it will be possible to manufacture 700 or 800 cars per annum. Adjacent to this building will be the log saw-mill, 150ft. by 75ft., with basement for electric motors to drive the saws. A short distance further is the timber store, two floors, and the structure is 200ft. by 70ft. At the end of this building is the house for the steam fire-engine, and the stables will also be located here. The timber store is protected from the weather so that the wood in use will be well seasoned before being worked into the car bodies. Then there is the wood-working machine shop, which is 250ft. by 75ft. It is two stories high. The lower portion will be occupied by shafting and motors to drive the machinery above. Adjoining the shop is the iron assembly room, 275ft. by 78ft. Leading out of this room is the iron-working machine shop, which will contain plant for drilling, planing, &c. The smithy is close by, and here there will be four steam-hammers, with a jib crane, capable of lifting two tons, and 12 smithy hearths. Bordering upon the canal will be the boiler-house, with three 350H.P. boilers, specially manufactured by Mr. John Thompson, of Wolverhampton. This building is fireproof, and has a chimney at the end about 110ft. high. Then there are the engine and dynamo house, engineers' rooms, store-rooms, and lavatories. A workmen's dining-hall, to accommodate 200, is also in course of erection, and near this will be the iron racks for the storage of rough iron, and beyond will be the general stores—a building about 100ft. by 50ft. The paint shop will be 50ft. by 25ft. The buildings are being erected by Messrs. Hughes and Stirling, of Bootle, Liverpool, from plans by and under the superintendence of Mr. Huon A. Matear, F.R.I.B.A., Dale-street, Liverpool.

Longton, Staffs.—The Sutherland Institute—a building designed for use as schools of science, art, and technology, and also for the purposes of a public library and reading-room—was opened on Friday by the Duke of Sutherland. The Institute faces Stone-road, with return elevations to Rossyln and Cromartie roads. The foundation-stone was laid by the Prince of Wales three years ago, before the architect had been appointed. Afterwards a public competition was invited, Mr. Gilbee Scott, F.R.I.B.A., of London, acting as assessor, when both first and second premiums were awarded to Messrs. Wood and Hutchings, of Tunstall and Burslem; both designs were illustrated in the Building News for July 9, 1897. The main body of the building is three stories in height, and of a Renaissance character. The middle portion is recessed about 6ft., and flanked by two wings forming broad gables. The buildings are of red brick facings, with terracotta dressings of a golden brown colour. The roofs are covered with brown tiles, with an oak turret in the centre, containing a ventilator. The reading-room to the left of entrance-hall is L-shaped, 60ft. by 30ft., and 28ft. by 16ft. On the right is the lending library, 44ft. by 32ft., librarian's rooms 16ft. by 13ft., and reference library 25ft. by 16ft. The rooms are 15ft. high; the floors of wood blocks on concrete; the walls plastered. Under the reference library is a book-store, and an iron spiral staircase leads directly to the lending library above. All the fittings of these rooms are in stained canary wood except the counter, which will have a mahogany top. A descent of ten steps from the library floor leads to the lower level, at the rear of entrance, where are two rooms, each 32ft. by 21ft., for manual training and engineering, and a cookery kitchen 29ft. by 21ft. The main staircase leads to the lecture theatre, a galleried room 54ft. by 44ft., accommodating about 400 people. On the first floor is a corridor 60ft. long and 7ft. wide. On this floor are science-master's room, 20ft. by 14ft.; science classroom, 20ft. by 16ft. 6in.; balance-room, 20ft. by 16ft. 6in.; chemical laboratory, 30ft. by 32ft.; science lecture-room, 30ft. by 21ft. On this floor is also a room, 32ft. by 27ft., for modelling, and room for plaster-casting work, 16ft. by 18ft. 6in. On the second floor is a room 45ft. by 32ft., divided by a curtain, for advanced art. The adjoining room, 28ft. by 16ft., is to be a museum. The next room, 21ft. by 14ft., is for the head-master, and a similar room, 21ft. by 16ft., is for mechanical drawing and designing. The end room to the south is 60ft. long. The contractors are Messrs. Tompkinson and Bettelley, of Longton, and their sub-contractors have been Messrs. Homan and Rodgers, Manchester (fireproof construction), and Messrs. Doulton and Co., London (terracotta work). The clerk of the works is Mr. Wm. Collis. The total outlay has been about £10,000.

Manchester.—The memorial-stone of the new Presbyterian church which is being built in Cheetham Hill-road, was recently laid. The school, which is nearing completion, is at the south side of the church. It will accommodate some 300 people, exclusive of the vestries. The church, like the school, is Early English in style, faced on the exterior with Ruabon red terracotta brick. The interior woodwork will be polished pitch-pine. The ventilation is stated to be unique. It is effected by fresh-air flues, constructed in the walls, under the windows, controlled by horizontal grids, fixed in the window bottoms. The foul air will be carried off through perforated openings, filled in with perforated zinc in the panels of the ceiling, the down-draught being controlled by means of vertical shutters fixed in each gable. The heating-chamber is below the organ-chamber, and is covered with a fireproof roof, hot water being the means adopted for the general warming purposes. The body of church will accommodate 407, and the choir 26 persons. The organ is to be placed near the pulpit. A small gallery is placed over the entrance vestibule which will hold 86 persons. At the north-west corner of the building, a square tower will be erected to the height of 78ft. The architect is Mr. H. Price.

New Brighton.—The Duchess of Westminster visited New Brighton on Saturday, and laid the foundation-stone of the Church of Emmanuel in Seabank-road. The new building is to replace a temporary iron erection. The plan of the church, which is to be entirely of brickwork, shows a lofty nave, 30ft. wide by 85ft. long, with low arcaded passages on each side and shallow transepts, arcaded baptistery, and entrances at the west end on Seabank-road. The chancel is to be 33ft. 6in. long by 25ft. wide, separated from the nave by open timber work. There will be vestries and an organ space on the north side, and a morning chapel on the south side. The floor will be of pitch-pine blocks, and the chair seating will give accommodation for 700 persons. The contract for the first portion of the work has been let to Messrs. Paterson and Sons, of Liverpool, and provides for the complete chancel and accommodation for about 350. The architect is Mr. Chas. E. Deacon, of Liverpool. The estimated cost of this section is £3,800, towards which £2,200 has been subscribed, and the cost of the entire church will be £8,000.

St. Albans.—The high altar screen at St. Alban's Cathedral, which has just been restored, at a cost of about £15,000 by Lord Aldenham, was unveiled by him, and dedicated by the Bishop of St. Albans on Wednesday afternoon. The central figure of the screen is said to be the largest sculptured Christ in England. It is 8½ft. high, and is carved from one block of magnesian limestone. The screen which is now restored had originally nearly one hundred statues, but the bases of two alone existed, and in other ways the screen had been severely multilated. Ten years ago Lord Aldenham, then Mr. H. H. Gibbs, M.P., undertook the delicate and costly task of restoring the screen so far as possible to its original condition, and, acting under the professional direction of Sir Arthur W. Blomfield, A.R.A., whose sudden death is reported elsewhere, the screen was intrusted to Mr. Harry Hems, of Exeter, who, aided by his sons, Greville C. Hems and H. Turner Hems, has carried out the whole of the now completed work. The screen itself is 42ft. high and 39ft. wide, extending from the north to the south side of the sanctuary. It is built entirely of clunch, a finely grained white stone obtained from the quarries of Totternhoe, in Herts. Sixty-two of the statues are fashioned in yellow magnesian limestone, whilst those of Our Lord in Majesty, attended by His twelve Apostles, situated immediately over the altar, are of pure white alabaster. The cost of the restoration will exceed £15,000, twice as much as Abbot Wallingford expended on the original structure.

Southampton.—The new municipal lodging-house, known as St. Michael's House, which has been erected in St. Michael's-square, by the town council, under powers conferred on them by the Housing of the Working Classes Act, was formally opened, on Friday, by the mayor. St. Michael's House is intended for the accommodation of 186 single working men, at a charge of sixpence per night. The building consists of four stories, with a frontage to St. Michael's-spuare of 65ft. It is built in three pavilions, with a space of 30ft. between each, the main entrance being in St. Michael's-square. Each cubicle provides 600sq.ft. of air space. The principal contracts have been carried out by the undermentioned firms: Building, Messrs. Dyer and Sons, Southampton (£10,798); lifts, Messrs. Smith and Stevens, Battersea. The planning of the building and details of the arrangements were were worked out by the borough engineer (Mr. W. G. B. Bennett). The premises occupy the site of an insanitary area of low-class property, bought under arbitration by the corporation for £28,762; the owners had claimed over £42,000.

Warrington.—New police buildings are being erected for the borough force on the site of the old barracks near Bank Quay Station. Mr. R. Burns Dick, of Newcastle-on-Tyne, is the architect; Mr. Hallard, Liverpool, the clerk of the works; and Mr. C. W. Davenport, of Stockton Heath, the builder, the contract being for £22,000. The building will be of pressed brick with terracotta facings, and will have electric light throughout. There will be two courts, one for the magistrates and the other for the coroner, both being on the second floor; there are also rooms for magistrates' clerk, detectives, juries, &c., and solicitors' and witnesses' waiting-rooms. Between the cells and Museum-street is a parade-room, 100ft. by 50ft., and in Museum-street are also the quarters for the inspectors and sergeants.

* * *

On Saturday, Bishop Royston consecrated the new church of St. John the Evangelist, Hindley Green, near Wigan. The church is in the parish of Hindley All Saints', and has cost close upon £5,000.

LEGAL INTELLIGENCE.

In re E. U. Ridgway, of Cardiff.—The first meeting of the creditors of Edward Uriah Ridgway, builder, of 132, Llandaff-road, Cardiff, was held at the Cardiff Bankruptcy Offices last week. The gross liabilities amounted to £6,134 16s. 4d., of which £1,233 5s. 9d. is expected to rank for dividend. The assets were estimated to produce £652 9s. 5d., leaving a deficiency of £580 16s. 4d. The cause of failure was alleged to be inability to realise properties built by him, and inability to obtain permanent mortgages. Debtor commenced business as a speculative builder at Cardiff in 1893 without any capital, and built in various parts of the town. In July, 1897, he was in difficulties, and his creditors agreed to accept a composition of 10s. in the pound. Immediately after this arrangement debtor restarted business. No resolution was passed, and the Official Receiver remains trustee.

Housing of Working Classes Act, 1890.—At the Marylebone County-court last week, his Honour Judge Stonor gave judgment in the case of "Newman v. Sanger." The plaintiff was a painter, whose wages averaged £2 a week. On August 27, 1898, the plaintiff's wife, by his instructions, took the basement of a house belonging to the defendant, at No. 14, Portnall-road, Paddington, at a weekly rent of 6s. By section 75 of the Housing of the Working Classes Act, 1890, it was enacted that when a house or part of a house is let for habitation by persons of the working classes "there shall be implied a condition that the house is at the commencement of the holding in all respects reasonably fit for human habitation." The sole question, therefore, for decision was whether the tenement let by the defendant to the plaintiff was "at the commencement of the holding in all respects reasonably fit for human habitation." Upon the evidence there could be no doubt that the drains of the house were out of order, and that the premises were not "reasonably fit for human habitation" for some time previously to January, 1899, and the question was whether the right inference to be drawn from the evidence was that they were out of order and unfit for habitation at the commencement of the holding on Aug. 27, 1898. After much consideration he was of opinion that such was the right inference, and that the defendant was liable for a breach of the implied condition created by the 75th section of the Act. The plaintiff claimed four weeks' wages—£8 16s.—which he actually lost whilst his employment was suspended on account of fever in his house, a doctor's bill, £3 5s., expenses of nursing and extra nourishment and expense of moving, £2 2s.—in all £14 3s. His Honour thought that the plaintiff was entitled to a moderate additional sum as damages, and he should fix the damages at £19, subject to the defendant's counterclaim for 12s. rent. Judgment was accordingly entered for plaintiff for £18 8s. and costs, leave to appeal being allowed. With reference to this case, a correspondent calls attention to a similar case, expressing the opinion that the effect of such decisions ought to be widely known. "In July last a bricklayer, who was in very poor circumstances, applied to the Mansion House Council on the Dwellings of the Poor for assistance under the following circumstances: He and his wife occupied four rooms on the upper floor of a house in East Dulwich at a rental of 7s. per week. At the commencement of the tenancy of the rooms a stone flight of steps (leading from the back room to the yard below) was in a very dilapidated and dangerous state. In fact, the second and third steps from the top were entirely broken away, and although the tenant complained several times to his landlord about the state of the steps, he was unable to get them repaired. In July his wife, in going down into the yard, fell from top to bottom, and injured herself seriously. On being applied to, the landlord refused all compensation. The officers of the Mansion House Council on the Dwellings of the Poor made careful inquiries into the merits of the case, and ultimately the council agreed to take the necessary proceedings for the purpose of obtaining compensation. The solicitor for the council accordingly brought an action under section 75 of the Housing of the Working Classes Act, 1890 (which renders landlords liable for letting premises unfit for habitation), in the name of the tenant and his wife against the landlord for damages for the injuries sustained by the wife, and, although the landlord defended this action, the Judge of the Camberwell County Court awarded tenants £6 damages, and remarked that the Act of Parliament above cited was not generally known, and that it was to the interest of the working classes that they should be made aware of its provisions by such an action as that brought by the tenants."

Public-Houses and the Building Act.—An appeal under the London Building Act of 1894 was heard by Mr. Sheil, at Westminster Police-court on the 26th ult., the appellants, Messrs. Snewin Bros. and Co., builders, of High-road, Upper Clapton, N.E., asking the Court to overrule a notice of objection served by Mr. Edward Drury, district surveyor, in respect of the rebuilding of the Regent Arms public-house, Regency-street, Westminster, the County Council's officer demanding fireproof separation walls, &c., between the parts used for trade and the parts used as a dwelling-house.—Mr. Percy Gates appeared for the appellants and Mr. Horace Avory for the County Council.—The objection was taken by Mr. Gates that a public-house was used wholly for the purpose of trade. In his favour he quoted the quite recently decided case of "Carritt v. Godson" in the Divisional Court. Mr. Avory said he must admit that the case was against him. These proceedings were really taken so that the County Council could go to the Court of Appeal. In the particular case decided they were precluded from going to the Appeal Court, the proceedings being under another section which involved a penalty. Mr. Sheil stated that after this admission he could not grant a case. It would be presumptuous for him to disregard the opinion of two Judges. Counsel could apply for a rule *nisi* against him. Mr. Avory: I shall have to do it, and for that purpose we must have the facts recorded. A partner in the firm of appellants gave evidence as to the building operations, service of notices, &c., and admitted, in answer to Mr. Avory, that above the bars, &c., to be used for public-house purposes, there were private bed and sitting rooms for the use of occupants. Mr. Sheil allowed the appeal, with costs.

Ladders not Scaffolds under the Workmen's Compensation Act.—His Honour Judge Whitehorne decided an important point under the Workmen's Compensation Act at the Birmingham County-court on Thursday in last week. An action was brought by Thomas Sutton, a bricklayer, against B. Whitehouse and Sons, builders. Sutton was repairing the roof of a house and fell from the ladder, and he claimed 16s. 8d. a week under the Workmen's Compensation Act. His Honour, in giving judgment, said the question raised was what is really meant in the Act by the term "scaffold." The Act applied only to employment on, in, or about any building which exceeded 30ft. in height that was being constrncted or repaired by means of a scaffolding. The applicant was doing the repairs to a roof by means of two ladders lashed together, and, following the decision of the Court of Appeal that a ladder was not a scaffold, his Honour held that the case did not come within the Act. He therefore dismissed the application.

Portico Shelters at Hotels and the London Building Act.—Justices Ridley and Darling heard in the Queen's Bench Division on Wednesday an appeal by the Coburg Hotel Company from a decision of Mr. De Rutzen, who, at the instance of the London County Council, had directed the appellants to demolish a canopy or shelter projecting from the portico of their hotel in Carlos-place. The council had consented to sanction the erection of the portico, which was beyond the general line of buildings, but they declined to permit a projecting screen to be attached to it to protect from the weather visitors to the hotel alighting from cabs and carriages. Notwithstanding this refusal, however, the appellants had erected the canopy. Mr. De Rutzen, sitting at Marlborough-street, had held that the shelter had become part of porch, and was a structure erected beyond the line of buildings within the meaning of the London Building Act, 1894. The Court dismissed the appeal, as the question as to what constiuted a structure was one of fact, which had been decided by the magistrate against the Hotel Company, and as to which there was no appeal. Both the learned judges expressed their regret at being compelled to come to this decision. Mr. Justice Darling advised the appellants to obtain a music and dancing license, so that they might retain the canopy. They need not use the license.

London County Council and its Building Regulations.—At the Surveyors' Institution, Westminster, on Monday, the tribunal of appeal, consisting of Mr. A. Cates (chairman), Mr. A. A. Hudson, and Mr. J. W. Penfold, heard an appeal from Mr. William Elsdon against the refusal of the London County Council to pass his plans for the erection of stables on his property at Caroline-place, Fulham. Counsel, in his opening statement, said the appellant was the owner of cottages, 3 to 10, Caroline-place, Fulham, which he purchased in February last. The previous owner had sent plans for the erection of stabling which had been passed, as to drainage, by the vestry of Fulham. Caroline-place was a foot road about 18ft. wide, with posts at the entrance, and the Council objected to pass the plans on the ground that the site was too narrow. The appellant, in his evidence, offered to include in his site Nos. 1 and 2, which were the property of his daughter, and to set back his building 15in., so as to make the width of the road over 20ft. Mr. Andrews, for the Council, urged that they were bound to carry out their regulations. There were streets in London to-day which the Council were widening at great public expense which had become thoroughfares in the same way as was proposed in this case. Mr. John Hebb, assistant to the superintending architect of the council; Mr. C. Botterill, surveyor of Fulham; and Mr. F. W. Hammond, district surveyor, gave evidence. The chairman stated that the tribunal would allow the appeal, subject to Nos. 1 and 2 being pulled down and included in the site, to the building being set back 5ft. and a footpath 4ft. wide being made, and the posts being removed and replaced at the cost of the appellant.

CHIPS.

The Speaker, who is the first Honorary Freeman of Kingston-on-Thames, unveiled, on Monday, a new stained-glass window which has been placed in the town-hall as a memorial of the Charter granted to the borough by King John. The window was designed by the Mayor, Dr. Finney, and the work was executed under the supervision of Sir Arthur Vicars, Ulster King of Arms.

A work on "Scottish Market Crosses," by John W. Small, F.S.A. Scot., architect, Stirling, is about to be published by Mr. Eneas Mackay, of that town. The work, the first book published on the subject, will consist of a series of about 120 drawings of old Scottish Market Crosses, lithographed by the author. The general remarks, by Mr. Small, with an introductory chapter penned by Mr. Alexander Hutcheson, architect, of Broughty Ferry, will give a short account of all the known old market crosses, while the letterpress accompanying each plate will particularise each example.

St. Catharine's College, Cambridge, owes to the liberality of Mr. Alfred Proctor, M.A., one of its Fellows, the addition to its chapel of a stained-glass window. Mr. Thomas Garner, the architect, has produced a design which harmonises with the character of the architecture of the college building. The design represents the judgment of St. Catharine, who, with two college worthies at her side, stands before her judge.

In the Queen's Bench Division, on Monday, before Mr. Judge Ridley and Mr. Justice Darling, an appeal was heard of the Uckfield Rural District Council against a decision of the local justices, refusing to convict the Crowborough Water Company of breaches of the council's by-laws in connection with the building of a water-tower. For the company it was argued that the powers they possessed under a special Act exonerated them from compliance with the council's by-laws; but their Lordships declined to accept this view, and sent back the case to the justices with a direction to convict.

The plans of the new Sedgwick Memorial at Cambridge have been exhibited in the Woodwardian Museum. It will be the first building in that University town of the architect, Mr. T. G. Jackson, R A. The elevations show a frontage in red brick and stone. The museum of Palæontology will be on the first floor, and the classrooms attached will be, it is said, the largest in Europe. The museum of Petrology will be above these. The building is expected to be complete in a couple of years.

A course of twelve lectures on "Sewage and its Purification" will be delivered at University College, Gower-street, W.C., on Monday evenings at 5.30, commencing on Monday next, the 6th inst. The lecturer, Dr. S. Rideal, F.I.C., will give a review of the various processes that have been adopted for the treatment of sewage, with special reference to bacterial methods. The lectures are specially intended for persons engaged on sewage farms, and for others connected with the administration of the Public Health Acts.

The Auckland, Shildon, and Willington joint infectious hospital, Bishop Auckland, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The foundation-stone laying of the new municipal crematorium to be erected by the burial committee of the Hull Corporation, on a piece of ground to the eastward of the Hedon-road General Cemetery, took place on Monday. The building will cost £2,600.

At Oxford, on Tuesday, a vote of thanks was passed by convocation to Mr. Edmund Oldfield, M.A., F.S.A., late Fellow of Worcester College, for his gift to the university of a valuable collection of Greek, Roman, and Etruscan antiquities, of which Professor Gardner reports that it is of the kind specially suitable to a small museum like that of the University, consisting of a few carefully chosen, interesting things. Of the vases, four or five are of exceptional beauty and interest. Mr. Oldfield proposes to add eventually some other antiquities in bronze and marble.

Engineers have been at work for some time in the parish of Clovelly in levelling and marking out the Bideford and Clovelly Railway. They have reached the proposed terminus, Dyke Green, and, on the completion of the Westward Ho! Railway, the continuation to Clovelly will be started.

WATER SUPPLY AND SANITARY MATTERS.

The Main Drainage Question.—A conference of representatives of the leading parishes on the north side of the Thames was held on Friday afternoon at the Paddington Vestry-hall, Harrow-road, W., with the view of urging upon the London County Council the absolute necessity of at once taking steps for improving the main drainage of the area referred to, in order to prevent the flooding of the basement of houses in the low-lying districts in the time of storm. Mr. John William (Paddington) was elected chairman, and Mr. Frank Dethridge, president of the Metropolitan Local Government Officers' Association and vestry clerk of Paddington, was appointed clerk to the conference. Mr. H. Ward, chairman of the Main Drainage Committee of the London County Council, explained to the conference that that committee were about to present to the Council a report bearing upon the subject of drainage. After some discussion, the following resolution, moved by Mr. R. F. Whur (Paddington) and seconded by Mr. G. J. Chapple (Westminster), was carried:—"That this conference, comprising representatives of the leading parishes on the north side of the Thames, hereby places on record its surprise that, after so strong an expression of opinion by a committee of the London County Council and its responsible officers, that the existing sewer accommodation of the Metropolis was entirely inadequate to carry out the work required of it, no attempt has been made, notwithstanding the repeated representations made by vestries and district boards upon the subject, to remedy the intolerable evil referred to, and this conference urges upon the Council the absolute necessity of their at once carrying out such works as may be necessary to remedy the nuisance complained of." Mr. Dethridge was directed to send copies of the resolution to the London County Council and to the various local authorities, with a request to the latter that they should urge their representatives at the London County Council to support the recommendations of the Main Drainage Committee.

In consequence of the continuous increase in the number of inmates of the lunatic asylum at Brookwood, near Woking, the Surrey County Council are providing additional accommodation for 400 patients, and have entered into a contract for the purchase of the Netherne House Estate, Coulsden, for £10,000, so as to obtain further asylum accommodation for 800 or 1,000 patients.

New boundary-walls of red Rixa and grey Forest stone, with ornamental wrought-iron railings, together with teak lych-gates, are being erected around the churchyard, Bassaleg Church, Mon. The work is being carried out by Messrs. S. Shepton and Son, of Cardiff, under the superintendence of Mr. C. B. Fowler, F.R.I.B.A., also of Cardiff.

The work of restoring the fine old parish church of Thirsk—the "mother church of the Archdeaconry"—being now completed, special dedication services were held on Friday. The work of the present restoration was begun under the Vicariate of the Rev. J. C. Hanson, now Rector of Kirkby Knowle, and his efforts have been continued by the present vicar. The expenses of the restoration of the nave and tower have been about £1,550, and on the choir about 250, making the total cost about £1,800.

The Victoria Hall at Southborough, built at the cost of Sir David Salomons, is approaching completion. The building, which is of brick, adjoins the urban council offices. The hall proper is 55ft. by 40ft., and seats 500 persons on the ground floor and 100 in the gallery. Messrs. Strange, of Tunbridge Wells, are the contractors.

On Saturday night, at the Durham College of Science, Newcastle-on-Tyne, Mr. Arnold Mitchell, F.R.I.B.A., lectured to a large audience on "Mediæval Architecture." On the following evening, in the Tyne Theatre, under the auspices of the Sunday Lecture Society, Mr. Mitchell lectured on "English Cathedrals." Mr. Mitchell commented upon the beautiful positions occupied by the English cathedrals as compared with the cramped and confined situations of Continental edifices, giving, as a notable instance, Durham Cathedral, which held, he said, the most beautiful position of all. With the aid of numerous lantern-slides, the lecturer showed the architectural details of the old English cathedrals, without and within, showing how the architects and builders progressed in their ideas of ornamentation from simple to elaborate forms.

The town council of Wolverhampton decided on Monday to purchase the Harley property in Queen-square, for the widening of that thoroughfare, for £23,000. The property recently changed hands by auction, and was then bought for £19,000 by Messrs. Horton's Estate, Limited, and the town council now only acquire at a higher rate the larger portion of the land then transferred.

Our Office Table.

In anticipation of the opening of the sixty-fifth session of the Royal Institute of British Architects, on Monday evening next, when Mr. William Emerson will deliver his Presidential address, the *Kalendar* of that body has just been published. The membership roll shows that the Institute now comprises 618 Fellows, 993 Associates, 11 Hon. Fellows, 46 Hon. Associates, and 65 Hon. Corresponding Members, as against 603 Fellows, 992 Associates, 11 Hon. Fellows, 50 Hon. Associates, and 65 Hon. Corresponding Members at the beginning of last session; the total numbers in all ranks being now 1,733, against 1,721 last year, or a net increase of 12. The very slight augmentation of the number of Associates is noteworthy. Under the heading of "Educational Facilities in London," particulars are given as to the Central School of Arts and Crafts, Regent-street; otherwise the *Kalendar* is arranged on the stereotyped lines of recent years.

Mr. A. Wallace Rimington, R.P.E., whose fame as a charming delineator of architectural subjects is well known, particularly to our readers, is about to show an exceptionally comprehensive and attractive collection of water-colour paintings from Italy, Southern France, and Sicily. The exhibition, which will be opened on Monday next, the 6th inst., will be held in the Fine Art Society's Galleries in Bond-street, and we understand it will be the largest which Mr. Rimington has yet arranged at one time, as both the large rooms will be united to make space for his pictures. These will include a considerable number of architectural subjects well worthy of the attention of members of the profession, as well as those who practise in the allied arts.

An address on "Sanitary House Construction" was delivered at Carpenters' Hall on Thursday evening in last week by Mr. Thomas Blashill, F.R.I.B.A. The lecturer urged the importance for considerations of the health of the inmates that ample provision for warmth and ventilation should be made in the dwelling, and also that it should not be liable to penetration by heavy downfalls of rain. The walls of a house, whatever was the material employed, should be equally proof against damp and the quick passage of heat. The experience of ages had taught people how to erect walls properly, so that they generally found them able to comply with those conditions. In this country stone or brick was almost invariably employed for the purposes of construction. Stones that easily stood the pure air of the country were very often unable to withstand the atmosphere of our large towns, and the destructive effects of the acids with which it was impregnated. They had a striking illustration of that in the Houses of Parliament, which were built of yellow Mansfield, a magnesian limestone. Of all the stones granite was the most imperishable, because of the large percentage of pure quartz which it contained. It was notorious, however, that granite would not stand heat, and therefore it should never be used in cases where it was known that it would be so exposed. In the course of his lecture Mr. Blashill pointed out the importance attached by medical sanitary science to the construction of the lowest floor of the house. It was requisite in the highest degree, in the interests of health, that the usual 6in. bed of concrete should rest on a foundation of firm soil, and that the wooden flooring above the concrete should be fixed with great accuracy. By those means no reservoir for foul air should be left under the floor, and ventilating drains would not be wanted.

As a result of the efforts which have been made by the committee of the Shropshire Archæological Society and the Archæological Institute, further excavations have been commenced on the site of the Roman city Uriconium, about six miles out of Shrewsbury. Many years have elapsed since a portion of the buried city was unearthed, and valuable relics (now in the Shrewsbury Museum) discovered; but the want of funds and other causes brought the excavations to a premature termination. Similar work which has been going on at Silchester of late years has prevented researches at Uriconium being taken up by the institute; but at last the appeals from the Shropshire Archæological Society for the resumption of the work have been rewarded, and next spring will see the excavations in full progress. Already Mr. W. H. St. John Hope has commenced operations on a small scale on the south side of what is locally termed "the old wall," but which is, in fact, a part of the Basilica, a great public building in the centre of the city. Adjoining this has been found the remains of another important building, which is believed to have been the courthouse of the city, and several square feet of the tesselated flooring has been uncovered; but the centre, which was, no doubt, of handsome design, is missing. What has already been found is ample to justify the belief that there is still remaining under ground very much of interest that no eye has seen for nearly fifteen hundred years.

THE School Board for Halifax have decided, on the recommendation of the sites and buildings committee, that the terms and duties of the architect proposed to be appointed by the board should be as follows:—(*a*) A retaining fee of £25 to be paid, and a commission (to cover cost of specifications and bills of quantities) of 5 per cent. on the amount of tenders accepted for any buildings and alterations, &c., exceeding £200 in value. (*b*) The fee of £25 shall be considered as payment for all such work as costs less than £200 in carrying out. (*c*) The engagement shall be terminable on one month's notice on either side from any date. (*d*) His duties shall include valuation, survey, and preparation of plans of sites as required by the Education Department, and advising the board in the purchase of land, &c.; the preparation of all requisite plans, detailed drawings, and specifications; taking out of quantities and providing copies for contractors; preparation of estimates; superintendence of the erection of school buildings until completion; measuring up extras and deductions, and making out contractor's accounts on completion; and generally whatever is considered to be usually the work of an architect.

AT the last meeting of the Building Plans Committee of the Leeds Corporation information was given concerning a new test for drains which has just been adopted in the city. The appliance is styled the "Eclipse" Drain-Testing Apparatus. To test a drain one end is stopped up. To the other end the patent apparatus is fitted, and pumps in smoke, which soon reveals any leaky joint. Where possible, all new drains, before being sanctioned by the committee, will in future have to undergo this test. It was reported that during the past twelve months 2,607 sets of plans had been dealt with by the committee, as compared with about 2,000 during the corresponding period of last year.

THE Dewey Arch in New York will most likely be made permanent, by replacing it with one in marble, as was done with the Washington Arch, at the southern end of Fifth Avenue in the same city, some years ago. A subscription of fifty thousand dollars towards the cost has been promised, and it seems probable that all the money necessary will be raised without difficulty. The situation of the Dewey Arch is much less favourable for such a monument than that of the Washington Arch, but this may be changed. Mr. J. Q. A. Ward, the president of the National Sculpture Society, and the sculptor of the Victory group on the Dewey Arch, suggests the middle of Union Square as a suitable site, observing that, in such a position, traffic might either pass through it or around it, as is the case with the Arc d'Etoile in Paris. Meanwhile, the designer of the arch, Mr. Charles R. Lamb, is modest enough to say that is only a sketch, and that plenty of time should be allowed for studying the design before it is executed in marble.

AN "Indian patent stone," for which claims are advanced that it is durable, ornamental, and both vermin and damp proof, is being made in Calcutta, and is said by exchanges from the Presidencies to be coming more and more in favour for floors in mills, warehouses, offices, and public buildings. It has been adopted in the new Miltary Students' Quarters, Medical College, Coolootollah, and in the new Presidency General Hospital, Calcutta. The 22 new receiving sheds, now under course of construction by the port commissioners at the Kidderpore Docks, are to be floored with this stone, and the concrete underfloor is also to be done by the stone company. The area aggregates about 350,000sq.ft. The new station buildings and general offices of the Assam-Bengal Railway at Chittagong, measuring about 70,000ft., are also being floored with the same material.

ARTIFICIAL paving-stones are being successfully produced in Germany. The demand in all larger cities is said to be so good, and the expense attached to their production under former methods is so large, that any improvements on the older systems, whether in saving money or in producing a better stone, will be welcomed by almost all countries. The newest process in Germany is to mix coal-tar with sulphur and warm thoroughly; to the resulting semi-liquid mass chlorate of lime is added. After cooling, the mass is broken into small pieces, and mixed with glass, or blast-furnace glass slag. This powder is then subjected to a pressure of 200 atmospheres, and reduced to the form or forms wanted. The resistance to wear and tear in use is fully half as great as that of Swedish granite. Thus it commends itself through durability equal to that of many stone roads, resistance to changes in temperature, roughness of surface—giving horses a good foothold—and, finally, non-transmission of sound. Inasmuch as the joinings are very small, dirt is avoided, and cleaning is very easy.

CHIPS.

The Salford Corporation have appointed Mr. E. Hatton, of Birkenhead, as tramway engineer at a salary of £240 a year.

Extensive water supply and drainage works, on the most modern systems, are being carried out at Hensol Castle, Glam., for Lady Price Fothergill. New farmhouses and repairs at castle, &c., are also in progress at a cost of over £4,000. Messrs. George Jennings, of Lambeth, are carrying out the water and drainage works, and Mr. W. A. James, of Cowbridge, the remainder, under the superintendence of Mr. C. B. Fowler, F.R.I.B.A., of Cardiff.

A bust of the Queen, by Mr. Alfred Gilbert, R.A., executed in commemoration of the Diamond Jubilee, was unveiled at Port of Spain on Thursday by the Governor of Trinidad.

The fine old font in the Grantham Parish Church has been elevated, and provided with a richly carved oak cover, 26ft. high, at a cost of £400, as a Jubilee commemoration. On Friday, the Bishop of Lincoln held a service of dedication.

Mr. John Court, builder and contractor, Sheerness, died suddenly in his chair at his residence on Saturday afternoon. Mr. Court, who was 81 years of age, was the owner of a great number of houses in the town.

The Stoke-on-Trent board of guardians have adopted a scheme prepared by Mr. George R. Peers, electrical engineer, Manchester, for lighting by electricity the workhouse buildings at an estimated cost of £4,250.

It was reported at a recent meeting of the National Photographic Record Association that 100 prints had been presented by the President, Sir J. Benjamin Stone, M.P., of matters of interest in Lincoln, Shrewsbury, the rock dwellings in Staffordshire, &c.; by Mr. T. W. Sharp, of some valuable records of the excavations now being carried on near Glossop; by Mr. P. Ridge, of some of the old crosses at Iona; by Mr. E. Scamell, of old houses in the Strand, &c., and by the hon. sec., Mr. Geo. Scamell, of various old churches at South Mimms, Pinner, Aldenham, &c., including a series of views of Christ's Hospital.

On Saturday last, Oct. 28, foundation-stones were laid of a new Congregational church, Buxton-road, Stockport. The building is to provide accommodation for 400 persons, and is being erected at a cost of about £3,000. The contract has been intrusted to Messrs. S. Robinson and Sons, builders, Hyde, who are carryying out the work under the superintendence of Messrs. Sankey, Cubbon, and Cubbon, King-street, Manchester.

A parish church built at Morningside, Edinburgh, was opened on Tuesday. It is 56ft. by 40ft., and is seated for 650 persons. Messrs. Hardy and Wight, of Edinburgh, were the architects.

A special meeting of the town council of Boston, Lincolnshire, was held on Wednesday week to consider a resolution of the finance committee recommending the council to offer £60,000 to the Boston Gas Company for their undertaking. The council rejected the recommendation, and instead decided to apply for a provisional order under the Electric Lighting Act, enabling the council to serve the town with electric light.

The foundation-stone was laid on Saturday afternoon at Poulton, Cheshire, of a new chapel-of-ease for the Wallasey parish church, to be called St. Luke's. The new building is to take the place of an iron edifice which has been used for some time. It is intended to erect only the nave at present, while the chancel, organ loft, &c., will be added as soon as possible. When finished, the edifice will be capable of seating 522 people, while the portions already in hand will accommodate 312. It is to be of Runcorn stone.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Society of Engineers. "Electrolytic Treatment of Complex Sulphide Ores." by Sherard Cowper-Coles. Royal United Service Institution, Whitehall. 7.30 p.m.
Royal Institute of British Architects. Opening Address by the President, Mr. W. Emerson. 8 p.m.
University College, Gower-street, W.C. "Sewage and its Purification," by Dr. S. Rideal. 5.30 p.m.
Liverpool Architectural Society. Opening Address by the President, Mr. E. A. Ould. 6 p.m.

TUESDAY.—Institution of Civil Engineers. Address by Sir Douglas Fox, President. 8 p.m.
Architectural Association of Ireland. "Architectural Practice Two Hundred Years Ago," by Mr. T. E. Hudman. Grosvenor Hotel, Dublin. 8 p.m.

WEDNESDAY.—Edinburgh Architectural Society. "The Planning of Schools," by Mr. Robert Wilson. Dowell's Rooms. 8 p.m.
St. Paul's Ecclesiological Society. "The Pileus Quadratus: an Inquiry into the Relation of the Priest's Square Cap to the Academical Cater-Cap and the Judicial Corner-Cap," by the Rev. Father Robinson. St. Paul's Chapter-House, E.C. 8 p.m.

FRIDAY.—Architectural Association. "Marble," by Mr. W. Brindley. 7.30 p.m.
Glasgow Architectural Craftsmen's Society. "Estate Feuing Plans and their Preparation," by Mr. John Arthur. 8 p.m.

THE ARCHITECTURAL ASSOCIATION.
NOVEMBER 1 th, ORDINARY GENERAL MEETING, 9, Conduit-street, W., 7.30 p.m. Mr. W. BRINDLEY on "Marble."
G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

The dull monotony of grey stuccoed walls and blue slated roofs in the Three Towns is, says the *Western Mercury*, one of its most decided and least attractive features. It does not seem to have occurred to builders to lend some variety and an idea of pleasing warmth to the landscape by the importation of colour in the shape of red bricks and tiles. But, perhaps, the builders were not so much to blame in this respect as were the architects. A change, however, is gradually taking place. Here and there on the outskirts of Plymouth brick and tiles are taking the place of stucco and slates. But when all is said and done, there is nothing comparable to local limestone for durability and even freshness.

The corporation of Bradford propose to erect artisans' dwellings in connection with the Longlands-street district improvement scheme. Each of the larger houses will, it is estimated, cost £240, but some of the houses will be built without the attic accommodation, and the cost of one of these would be £226. On the basis of a sixty years' loan the former house could be let at 5s. a week, but on the basis of a forty years' loan the rent would be 6s. 2d. a week. In the case of the somewhat smaller dwelling the rent with a sixty years' loan would be 4s. 10d. per week, and with a forty years' loan 5s. 10d.

On Thursday in last week, Col. Marsh held an inquiry at the town hall, Burton-on-Trent, on behalf of the Local Government Board, relative to the application of the Mayor and Corporation to borrow £30,000 towards the cost of providing 156 workmen's dwellings in Bratt's Field.

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THE BUILDING NEWS
AND ENGINEERING JOURNAL.
VOL. LXXVII.—No. 2340.

FRIDAY, NOVEMBER 10, 1899.

DESIGN APPLIED TO MATERIAL.

TO-DAY the architect is brought face to face with many new developments of design. In previous ages his work was limited to structures of stone and brick, and his highest efforts were necessarily employed in giving expression to arched construction; and, to the wonder and admiration of subsequent ages, he achieved a remarkable success. Every great style, from the Roman and Romanesque down to the latest Mediæval buildings, was a record of the progress made in dealing with the arch and vault; and what an astonishing variety of style he created out of these apparently unpromising methods may be seen if we look at such diverse designs as those of the Baths of Diocletian or Caracalla, the Santa Sophia, Constantinople; St. Vitale at Ravenna; St. Mark's, Venice; and of any of our great Gothic cathedrals, say that of Amiens or Salisbury. If we have not succeeded so well in giving character and expression to modern methods, it is because our predecessors have possessed the greater opportunities of developing their resources, and because the modern architect is restricted by various limitations. Let us explain by referring to one of these. The engineer or architect of the present day is hampered in his use of the arch by several modern systems of construction, in which the principle of economy is inherent. He hesitates to span any of his churches with a great vault of masonry like those which cover the churches in Aquitania. Take, as an example, St. Front, Perigueux, or Angoulême Cathedral. Who would think now of putting such a tunnel vault of masonry over a church, or even a series of domes? He would be told his idea was not up to date; that a roof of this kind had better be constructed of concrete, or steel, or some other patented mode in which lightness and economy could be secured. An instance of the limitations imposed on the designer is found in bridge construction in which the arch is used. Although we have now several modern systems of arched construction in stone, concrete, steel, &c., the progress made in design has been slow. The later structures, it has been asserted by a recent writer—and very truly—exhibit little, if any, development from some of the oldest in existence. Why is this? The answer is: The modern bridge builder is handicapped by considerations of the same kind that restrict the church-builder. He is confronted with the theory of elastic flexure, and with all that that theory implies: the employment, for example, of the solid or open-arched rib, the combined use of concrete and metal, and the greater economy of material. These things make him chary of adopting the older inelastic arch of masonry, with all its solidity, architectural character, and associations. Nor can it be argued that the change to the new has been attended with corresponding advantages. The older builders have produced bridges which are still master-pieces of design and construction, as seen in our London and Waterloo bridges over the Thames, and in still older structures. "By dint of untrained genius," one writer says, "they have produced quite as satisfactory works as the later engineers, guided by well-developed theory." The fact is that the theory of elastic flexure applied to the arch has introduced so many newer methods of constructing arches, that the engineer is indisposed to adopt the older plan. And this principle has, of course, considerably altered the expression of bridges built with ribs. The arched rib, whether of cast iron or steel and concrete, cannot and ought not to imitate one of rigid blocks of stone. A different treatment is demanded, that has not as yet proved satisfactory, and so it comes about that our attempts to vie with the old arched construction have not been successful. It is true that greater spans have been attempted by the adoption of the elastic arch theory and its result, the metallic arch rib, as in the case of the Clifton arch-bridge at Niagara with a span of over 800ft., or the Washington Bridge over the Harlem River, which is hinged at the springing, and has a span of 500ft.—both examples of this development of the arch theory. On the other hand, the widening of the span has not favoured architectural conditions. It has, rather, taken away from the solidity and character of the structure, by setting up a *tour de force*. In fact, the principle of the arch rib allows of a larger span than has yet been given, as the theory of the elastic arch implies a resistance not only to thrust or compression, as in the old stone voussoir arch, but also to bending. Whether the arch rib has a solid or an open web composed of braces, no designer could give it the proportions of a masonry arch. The idea of tension as well as compression, of resistance to bending as well as thrust, have to be taken into account in the design—conditions met by the use of hinged arched ribs, but utterly repugnant to solid voussoirs.

In other aspects the use of iron or steel and concrete combined have to be considered. From the arch we may turn to the lintel, or that extension of it—the floor. The solid timber beam, with all its traditions, its romantic charm as a support to ceilings and roofs, still retains its individual character which no new substitute of it possesses. Our cast-iron and wrought-iron beams, valuable and necessary as they have become in construction regulated by modern requirements, have not those qualities of solidity and apparent strength which we see in the timber beam, and therefore, with all our improvements, we are compelled to admit that the structural engineer has failed to give us the artistic expression that the old builder and carpenter gave us in his timber ceiling or roof. And greater mischief has been done by attempting to conceal the flanged beam by casing it with wood. Is it better than to let the iron girder proclaim its real character as a scientific adaptation of iron to resist transverse strain? Let anyone go through the galleries of any of our great modern buildings like those of South Kensington, the Natural History Museum, or the Imperial Institute, and say whether he is satisfied with the visible beams of iron which support the floors and cross the ceilings of the several annexes and galleries, before they answer the question. They are lighter than beams of wood; but they impress one with the poverty and meagreness of our construction when we compare it with that of any ancient building. Yet is it not better to see the real thing than to conceal them by sham casings to look like solid beams? Certainly. The flanged girder asserts its claim to carry the floor, directly we think that it is of iron—that the material is disposed mechanically to produce the greatest resistance. But the question remains whether we can give it a more pleasing form, whether we could fill up the space between the flanges, or incase it solidly in concrete, moulding the latter? The combination of steel and concrete provides us with a clue, but it has not been satisfactorily followed. Steel, in the form of flat bars or rods, have been immersed in the concrete, and made to resist the forces of tension in the lower part. Here we have an approach to a scientific beam: floors have been constructed on the same principle. All that the architect waits for is someone who can mould these materials into forms without losing sight of the metallic skeleton within. When this is accomplished, we may see our way to a new style of building capable of expressing these two great materials of modern times. To take, again, our modern systems of patented fireproof floors, they are composite structures to a certain degree elastic. Many of them fulfil the conditions required of resistance to the spread of fire and of hygienic construction; but when we inquire how design has been applied to these systems, we can only say that the architect has been content to hide them with plaster, and to treat the ceiling in the ordinary manner.

The problem of iron-construction applied to buildings is too large a question to be discussed. Architects have attempted now and again to introduce details of a more reasonable kind; and if we compare the iron structures erected early in this century with those of to-day, the only thing we can say is that we have become more rational in the treatment of details; we know the properties of cast and wrought iron better than we did, and can design a structure with less waste of material. We have rather come back to the structural engineer by giving up the fanciful and ornamental attempts in ironwork which distinguished us forty years ago, as in such work as the roof of the central hall of the Oxford Museum, and in many of our modern provincial markets and railway stations. The ornate and crude efforts in cast ironwork, which distinguished the Gothic Revival, illustrate the low-water mark to which we fell, or rather show us how far we have travelled since. Still that is not all. We now understand what ironwork in construction should be, and it is half the battle.

The employment of terracotta, though not a modern revival, is another of the opportunities which the modern designer has of showing his power of adaptation. On the whole, we must be content with our progress. Many important attempts have been made in London by Mr. Alfred Waterhouse, Mr. T. C. Collcutt, Messrs. George and Peto, and other architects, to show how we have advanced since the terracotta work of the Albert Hall was done. Many mistakes have been committed by users of the material, which the designer and manufacturer of it have profited by. There is yet room for improvement; architects who use this material often fall into the error of treating it like stone, or of substituting it for stone in their dressings, without regard to its nature as a moulded material; they employ it in larger masses than it is qualified to stand without considerable shrinkage and loss of true line, or they do not make sufficient allowance for shrinking in the processes of drying and firing. The smaller the pieces and the less pronounced the projections are principles in its employment and design that have not yet been generally adopted, and there is a desire to attain to proportions and dimensions that manufacturers are too often disposed to yield to. We have confined our remarks to a few structural materials, though there are others of a decorative character which leave much to be desired in the application of true technical principles to design. These are matters, indeed, which can only be dealt with by architects and those engaged in the manufacture. The technical school and the art school have been satisfied to follow the old methods, even where a decided departure was called for. The student and craftsman have been taught to copy designs and to work in materials on principles and traditions that applied to the older systems of construction, but left without opportunities to master the newer materials and problems of the present. No system of construction or style has ever been hurriedly brought into use, nor can we expect to learn the lessons which our newer materials and methods teach without thought and experience.

THE CLAIMS OF GOTHIC AND RENAISSANCE.

TWO papers of some interest to all who are keen observers of the development of modern architecture have been lately read—one before the Manchester Society of Architects by Mr. Basil Champneys, M.A., and the other by Mr. W. Emerson before the Institute of British Architects last Monday. As we give a report of the latter, we shall chiefly confine our remarks to the paper read by the first-named gentleman, whose work is well known, and chiefly on the main conclusions which Mr. Champneys draws. Entitled "A Comparison of the Claims of the Gothic and Renaissance Styles," his paper has a practical bearing on the future of our architectural style. It is unnecessary here to go over the ground covered by Mr. Champneys' remarks, well known to our readers—the chaotic condition of architecture at the end of the last century; how Gothic had been dead and buried for two centuries and a half, and was superseded by various phases of revived Classic, except for a few *dilettanti* like Walpole; how Renaissance was imported here from Italy at the revival of ancient learning, but did not take root till many years afterwards, and then not unmixed with the Gothic traditions of our own country—incidents in the history of art well known to all students. Wren's influence was undoubtedly far greater than that of Inigo Jones, who introduced the Italian into this country; it transformed London after the Great Fire, and as the author of the paper says, the Renaissance style was found not only in the most pretentious buildings, but also in the humblest. The various phases were "lumped together" under the title of "Queen Anne." Their principles were followed with intelligence by the ordinary builder, mason, and joiner. In fact, we have here the general character of a good deal of our vernacular Classic of the 17th and 18th centuries. The builders appear to have adapted these phases to their own wants, and we have the Classic brick mansions and houses we see in most old towns, which, though dull and heavy, were built solidly, and had some some good Classic detail. After this phase came a time of revivals; there was first a Greek revival when St. George's Hall, Liverpool, was built, and when Stuart's "Athens" was published; then we had the Gothic revival. There were in fact two main architectural currents. There were those who followed Late Middle Pointed and Early English or French, just as their predilections disposed them, while in Classic some followed the formal Classic types, others the more mixed styles of Holland. These later changes are within the recollection of even the younger amongst us. Unfortunately in both these revivals we had to go back to a former type instead of being able to take up the threads of the style where it was discontinued. To the architecture of Rome, of course, we can trace both Renaissance and Gothic, and, therefore, we see the continuity of these great styles or their origin. All this is a matter of history; but Mr. Champneys shows that Gothic, like Roman, was adapted "to all the requirements of contemporary civilisation, and by simple and legitimate means took possession of the entire field of architecture, ecclesiastical, military, civil, and domestic." The Renaissance did not adapt itself so readily: it had to bridge over a gulf from the architecture of Classic Rome to that of the 15th century. The new learning of Greek and Roman literature made it even more difficult for the patrons of architecture to bring themselves to the level of the domestic requirements of the day. A rigid observance of Classical forms and proportions, the study of Classical monuments rendered it extremely difficult for the architect to adapt his art to domestic wants or to ordinary buildings. This is the indictment that the author brings against the Renaissance, that "its life has been of three centuries as against fifteen centuries (the Gothic), and even for this comparatively brief period its development has been rather one of adaptation of formula than a free and natural growth." He points out that the longer career of the Gothic, and its spontaneous development has resulted in its greater elasticity, and more frank and direct adaptation of means to ends, while the Renaissance has a more restricted movement, and requires a more forced and artificial adaptation to the requirements of the age. To illustrate this more restricted adaptation of Renaissance, the author instances Inigo Jones's banqueting hall at Whitehall, which, as we all know, is a mere fragment of a projected palace or quadrangle. No one will say that it evidences its use as a chapel, while in good Gothic the functions of each part is expressed. "Formula rules at the expense of appropriate adaptation." St. Paul's Cathedral is another instance: it has an external and an interior dome, and the upper stories of the side aisles are really nothing more than screens to conceal the real construction. There was a want of elasticity in both buildings, however noble they are as Classic examples. Very different is the Gothic cathedral. Every part and function is expressed in its external form; it is, as Pugin said, the most economical structural form. Classic architecture never adapted itself to ecclesiastical work: it had to "create a new tradition." These historical facts are important in helping us to discern the probabilities of the future. There is a gulf to be bridged in both styles; but the question is, chiefly, which is the easiest? There can be no question as to Gothic, as being the most adapted for ecclesiastical purposes; but is it likely to be applied largely to domestic or civic buildings? Answering this question, the author of the paper we are discussing says: "Looking back at these conscientious but hopeless efforts, the impression produced on us is that of an endeavour to reach at the moment what could be legitimately obtained only by the accumulated invention of generations. On the other hand, we find everywhere domestic buildings removed from our own date only by a slight difference of time and modes of life, refined, unpretentious, and practical, which seem only to need some touch of vitality to render them perfectly satisfactory on the æsthetic side, only slight modifications to bring them up to date on the practical." No one can question this conclusion. Ordinary house-building has been reared in the Renaissance tradition. The author does not favour any combination of the elements of both styles. He seeks to vindicate a style of architecture "which, after holding the field for some time, has shown signs of passing out of fashion." These are principles inherent in Gothic, at least, which make it adaptive to all purposes, and the best Renaissance efforts are those in which these principles are observed. Any probability of a new style as being likely to arise is not entertained, although a zealous and thoughtful band of young architects are putting forth noble aims to make a start from the beginning. The author does not think they will succeed, or be able to eliminate all architectural features. Nor do we. We do not believe in a new style, but we believe that in working honestly at the problem of construction and expression under the guidance of the two great styles which have been handed down to us, but not hampered by details or tradition, we shall be really more likely to bridge the gulf, and to carry on the true spirit of architecture.

The East River Bridge between the boroughs of Manhattan and Queens, New York, which is to cross the river at Blackwell's Island, has been studied sufficiently for preliminary data to be submitted to the Secretary of War.

ESTIMATES.—XXIX.

CONSTRUCTIONAL IRONWORK, ETC.

IN estimating cast-iron work, like stanchions, girders, &c., the weight is the determining factor. In these castings the weight must often be obtained by dissecting the flanges, ribs, stiffeners, and other parts, and adding their separate weights. By the use of tables found in Laxton's and other manuals, this work may be facilitated. One authority gives the weight of a cubic foot of cast iron as 444lb., another as 465lb. As the weight of a superficial foot 1in. in thickness is 37·5lb., and of wrought iron 40lb., we can easily calculate any other superficial area or thickness. (See our remarks last week.) One rough rule to find the weight of castings is to multiply the weight of deal pattern by 17.

Wrought iron is also measured and valued by weight. In pricing iron trusses for roofs, the weight and height in hoisting must be taken into account. The holes, bolts, eyes, plates, and special forgings are numbered. The weight of the metal may be first summed out, and, after, the several labours upon it. Wrought-iron bars and plates are quoted from £8 10s. to £11 15s. per ton. Steel, delivered in London, ranged from £7 per ton to £15. Rolled steel girders are priced in one list at from £7 to £9 per ton prime cost, according to depth and width of flanges; the latter prices are for rolled girders 18in. to 20in. by 8in., which weigh about 80lb. to 100lb. per foot. Square-head bolts, nuts, and washers cost about £1 5s. per cwt.; the smaller the bolt in diameter the more it is; bolt-ends, with square nuts, ¾in. and larger, at 17s. per cwt.; hexagon nuts about 2s. 6d. extra per cwt. Straps and ties in floors and roofs, per pound 3½d. (See list of rivets and bolts.)

For an iron truss roof it is necessary to measure all the items of one truss, or weight them out as a total cwt. in "No —roof-trusses, describing the sizes of rafters, struts, tie-rods, &c., span and rise of roof, hoisted and fixed — feet above floor level." The bolts, nuts, kingheads, forged shoes, eyes, &c., are also measured and weighted out, or numbered. A separate item for forging, bolting, riveting, &c., is the better plan. Purlins should be taken as so many feet run, and weighed out in cwts. Number bolts if not more than 9in. long, including heads, nuts, and washers; if longer weight out the bolts at so much per foot run. Holes and rivets should be numbered, stating diameter and thickness of metal they pass through, and the kind of head. The tackle, hoisting, and fixing are included or taken separately, as the case may be.

Tables of weights of different sections are indispensable in calculating the weight per foot lineal of L, T, I channel and other iron; but the following rule is useful. Multiply sectional area in square inches by 10, and divide by 3. For example, a wrought-iron T-iron is 4in. by 3½in. by ½in. The area is 3¾sq.in., and $\frac{3\cdot75 \times 10}{3} = 12\cdot5$lb. per lineal foot.

Wrought-iron casements are numbered, and the fixing taken separately, describing the size. It is better to number them at a p.c. value each, or specify to be supplied by any well-known firm—like the Crittall Manufacturing Company, Braintree; or Messrs. Burt and Potts, Westminster.

The prices of wrought-iron casements vary a good deal. A 24in. wide casement 4ft. 6in. high may cost from £1 3s. to £2 10s.

Fig. 1 shows connection of king-post and principals, also ridge. Fig. 2 is the shoe (cast iron) connecting feet of rafters with tie-beam. Figs. 3 and 4 show two other arrangements, in which ⅝in. plates are riveted to rafters, and a 1¼in. steel pin secures end of the rod. Fig. 5 shows junction of king-post and struts. These details are for a truss of 40ft. span, placed about 7ft. 6in. from centre to centre.

CAST IRON COLUMNS.

Provide and fix in office a cast-iron column 14ft. high, 9½in. diameter bore in clear, 1¼in. in thickness, with moulded base and ornamental cap, base-plate, bolts, &c., and bed same in brick pier.

This is a single column to take the bearing of a girder that runs overhead, and is of a special kind. In valuing, it is necessary to obtain the weight. The thickness of metal is 1¼in. A foot length of a cast iron cylinder of this bore and thickness would weigh, according to table, 131·9lb., and as there would be 14ft. in height, the weight at, say, 132lb. per foot, would be 16cwt. 2qr. nearly; the cost of column without cap and base would be at, say, 9s. per cwt.

	£	s.	d.
Cost of column delivered	7	8	0
Capital to design, about ½cwt. at 16s.	0	8	0
Base moulded, say 82lb.	0	10	0
Pattern, say	2	5	0
Fixing at 1s. 9d. per cwt.	1	8	0
	11	19	0
10 per cent. profit	1	4	0
	13	13	0

This is rather a high price. For speculative work, 7s. per cwt. would reduce item nearly £2.

WROUGHT IRON JOISTS, ETC.

70cwt. 2qr. Rolled joists, 8in. by 4in., as per detail.

Obtain quotations from such firms as Measures Bros., Ltd. (see their section sheets), Messrs. Homan and Rodgers, &c. The cost of these joists will depend on design and length, depth, &c. Laxton gives 10s. per cwt. for rolled joists from town stock, delivered on job, up to 20ft. in length. A section 8in. by 4in. to 26ft. long may be priced at this rate, say—

	£	s.	d.
Cost of joists per cwt.	0	9	0
Fixing and hoisting, say	0	1	9
Per cwt.	0	10	9

For large orders a reduction may be made, 7s. per cwt., and fixing, say, 1s. per cwt. Hoisting and fixing can be let for 15s. per ton, including use of gear, but does not include unloading or fixing, nor bolts, holes, and other labour, say—

	£	s.	d.
Cost of joists per cwt., say	0	7	0
Hoisting and fixing, &c., say	0	2	6
Bolts and connections, say	0	0	9
	0	10	3

The item for unloading, getting in, hoisting and fixing will vary according to circumstances and height to be hoisted, from about 1s. 6d. to 3s. per cwt. Stock lengths are made from about 10ft. to 30ft.; any particular length has to be cut.

No. 4. Rolled steel joists 15ft. long, 6in. by 4½in., including hoisting and fixing in position.

	£	s.	d.
Cost of joist at 8s. 6d. per cwt., say	4	13	0
Hoisting and fixing	0	5	6
	4	18	6

The weight of each joist will be about 2¾cwt.

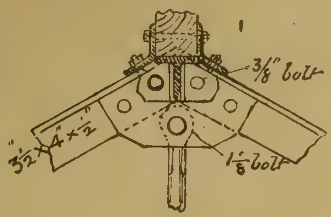
No. 2. Compound joist girders, supplied by Messrs. Measures Bros., as per detail (67cwt. 3qr.).

These compound girders or riveted-up joists will cost about 11s. 6d. per cwt., exclusive of fixing. (See section sheet of firm.)

136cwt. 2qr. Compound riveted girders.

A detail is necessary to show how these are riveted, and if there are top and bottom flange plates riveted to flanges. If they have top and bottom plates these must be allowed for—say 12s. per cwt. Add 1s. 6d. for hoisting and fixing. (In calculating weight it is customary to allow about 5 per cent. for rivets, stiffeners.)

1



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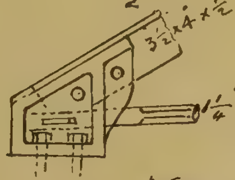

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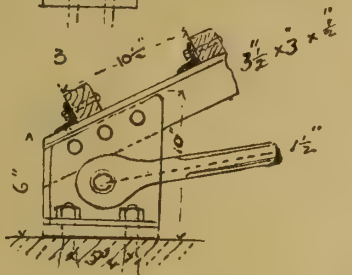

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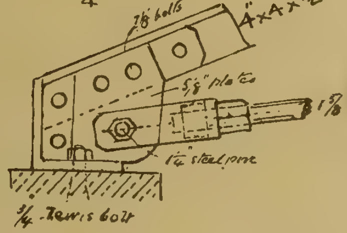

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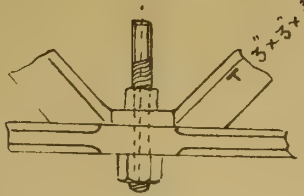

65cwt. in rolled joists, not exceeding 10in. deep, cut to lengths, and hoisting to different floors:—

Price these at 10s. per cwt., say.

	£	s.	d.
Cost of rolled joists per cwt.	0	10	0
Cutting to ditto, add 6d. per cwt.	0	0	6
Unloading, hoisting, and fixing (average say 2s. per cwt)	0	2	0
	0	12	6

28cwt. 2qr. in one riveted girder, 25ft. of boiler-plate with angle-irons and stiffeners, as shown in detail, and hoisting and fixing 22ft.:—

	£	s.	d.
This is probably to carry a heavy wall, and may be priced at 12s. 6d. to 13s. per cwt.	0	13	0
The unloading, getting in, and hoisting, including tackle, per cwt., say	0	3	6
Labour and fixing, say	0	2	0
	0	18	6

Making three connections with steel joists:—

If these are of the ordinary kind, say, 7s. each.

20cwt. 1qr. in compound girders of rolled steel joists, top and bottom plates:—

If these compound girders are made up of two joists side by side and riveted to plates, the price may be put down at 11s. 6d. per cwt.

ROOF TRUSSES.

110cwt. in No. 6 iron roof-trusses 40ft. span in clear, with 4in. by 3½in. by ½in. T-iron rafters, 3in. by 3in. by ½in. T-struts, and king and queen-rods from ¾in. to ½in. diameter, tie-rod 1¼in. to 1⅝in., as shown in drawings, including hoisting and fixing 35ft. from ground.

This is a large and important item, and cannot be well estimated without a careful examination of detail drawing, and any calculation should be based on an estimate from firms like Messrs. Measures Brothers, Homan and Rodgers, or other well-known constructional ironwork manufacturers. An approximate estimate may be obtained by taking the length and section of the T-iron rafters, angle-iron struts, bolts and ties, and the forged eyes, bolts, plates, and rivets required at the connections, and finding the weight of each. A dissection of one of the trusses must be made as follows:—

	£	s.	d.
44ft. run T-iron rafters, 4in. by 3½in. by ½in., at, say, 12lb. per foot, including cutting to lengths, rivets, &c.			
33ft. run T-iron in four struts, 3in. by 3in. by ⅜in., say 10 cwt. at 12s.	6	0	0
18ft. 1⅝in. tie-rod at ends, 12ft. 1¼in. ditto, 10ft. 1¼in. ditto, 10ft. 1⅜in. king-bolt, 15ft. 1in. four queens, say 4½ cwt.	2	14	0
No. 4. Screw ends to rods	0	2	6
No. 4. Forged ends to ditto, forked to form eyes for bolts, say	0	12	0
No. 8. ⅜in. strap plates riveted to struts, &c., say	0	6	8
No. 8. Forging ends of T-iron struts for bolts	0	16	0
No. 4. Screw-ends and nuts to bolts, 3d. each	0	1	0
No. 2. Cast-iron shoes to truss, say ½ cwt., each	0	14	0
No. 1. Forming king-head, as shown, say	0	7	6
No. 1. Screw-end bolts and nuts to king, &c.	0	4	0
Hoisting and fixing truss, 1s. 9d. per cwt., say	1	10	0
Each truss, say	13	7	8

Or, roughly, 16s. per cwt.

This is an approximate price, and must not be relied upon for any special quantity of roofing. The purlins would also have to be considered. These would be of angle-iron 2in. by 2in. by ¼in., and have ½in. bolts about seven purlins each side, and would cost about £9 10s. to £10 per ton.

These constructional items are generally contracted for by a structural engineer.

No. 6. Wrought-iron casements and frames 24in. wide and 4ft. 6in. high.

These are priced according to quality, form, and quantity. A fair price for ordinary wrought-iron casements would be 30s. to £2 each.

No. 3. Wrought-iron water-tight casements and frames 5ft. in height, hinged at side to open outwards, and prepared to receive plate-glass in one pane.

There are several qualities made. Those of quality No. 1, fitted with gun-metal lever handles and stays, lacquered or bronzed, are priced at 76s. each. But No. 3 quality can be had for about 60s. each. The fastenings make a considerable difference to the cost.

No. 6. Wrought-iron water-tight casements to be supplied by Messrs. Burt and Potts, Westminster; size, 2ft. wide by 5ft. high, with approved gun-metal fastenings.

Obtain price-list, as a good deal depends on the section and the kind of handles and stays.

MISCELLANEOUS.

Planing to caps and bases of four cast-iron columns.

Allow for this item, say, 9s. per foot super., probably about 8sq.ft., equal to £3 12s.

1cwt. chimney bars.

These are priced at about 2½d. per lb.

No. 3. Cast-iron air-tight manhole covers and frames, 2ft. 7in. by 2ft. 3in.

If these are painted, the cost would be about 42s.; if galvanised, add 12s. each.

No. 1. Cast-iron tank 8ft. by 6ft. by 4ft., ¾in. thick.

For weight, find superficial area of sides and bottom; adding one-third for flanges. Multiply this superficial by 28·12lb. for weight, and price at about 15s. per cwt.

No. 2. Hot-water tanks with cover, 2ft. 3in. long by 1ft. 8in. by 1ft. 8in., to hold 40 gallons.

These may be priced at about £1 15s. to £2 each, according to thickness of plates.

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WATER-COLOUR DRAWINGS FROM THE MEDITERRANEAN AND THE ADRIATIC BORDERLAND.

MR. A. WALLACE RIMINGTON, A.R.P.E., has covered the coast line from France to Dalmatia in search of subjects for his pencil, including Italy, Sicily, and Corsica, and the charming gathering of his pictures now on view at the Fine Art Society's Galleries in New Bond-street makes perhaps the largest which this artist has ever shown at one and the same time, numbering as the drawings do 130 individual works. They are for the greater part smaller in size than heretofore; but their author has not impaired his skill by the industry which such a collection makes so obvious. The buildings represented are in the main of minor importance, and Mr. Rimington has chosen doorways and parts of buildings rather than more general views. The Scuola di San Marco, Venice, is well rendered as an exception, and so is the orange-coloured cathedral at Palermo, that strange combination of Gothic and Saracenic art realised in stone. These subjects furnish two of the chief drawings in the room. One of the special charms of these studies is that they depict less-known subjects from the hinterland of the French Riviera, and some untouched and unspoilt places in Italy, the country to the south-west of Avignon and the Cevennes. The varied phases of architectural art have here their historical associations unimproved by restoration, while the wealth of flowers, the blooming trees, the sunny coast, rugged and sometimes wild, are always brightened by the colour of the sea and sky. The charm of Dalmatia, fringed with its island-serrated shore set in the Adriatic, seems to have impressed Mr. Rimington, and some of his best drawings from thence conclude his present series. To single out for special remark instances of his skill seems invidious, but none the less desirable. Thus the group of roofs seen from the ancient bridge and the big tower beyond from Vallebona, near Bordighera, deserves a note; and specially admirable is No. 9, the "Porch of St. Agostino" (Pesaro) as a spirited and truthful representation of one of those fine Gothic portals with disengaged shafts supported by lions, which are not infrequently met with in the towns of the North Adriatic coast. The effect is brilliant in full sunlight, and the clear dark shadow gives great body and force to this study in pure colour. The slighter sketch of the brick tower of San Francisco (Ravenna) is equally satisfactory, suggestive, and harmonious in tone (17). The monastery on the slopes of the Apennines, near Rimini, has a cloistered courtyard overlooking the sea. The groined arcade appears in No. 18. Another cloister is that of the well-known 12th-century church of St. Trophime at Arles (38), and from the cathedral there Mr. Rimington gives us a rich architectural study, also in the cloisters, where the reflected and mellow light on the rear face and soffit of the arcade is exceedingly effective.

We admire, too, the old Genoese tower from Porto, in its bright-red brickwork, contrasting well with the old village stalls in the fore-part of the picture (52). The fountain cloister, Monreale (74) was built by the Normans—an exquisite achievement, and refined in detail, recalling the cloister-work of Spain. It makes a very attractive subject, to which the artist has done justice. One of the most difficult tasks he has ventured upon is the drawing (109) showing the gorgeous gold mosaics in the south aisle of the Church of the Martorana, characteristic of Norman work in Sicily. The gold caps of the arcade heighten the general effect of richness, which the artist has managed with masterful repose and the dignity of a broad handling.

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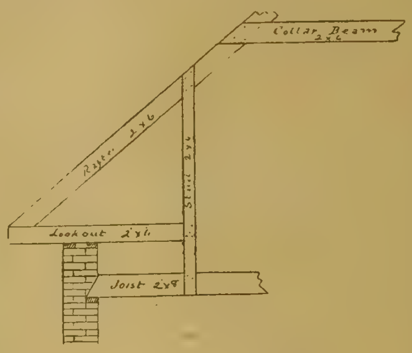
HALF-TRUSSED ROOF.

AN excellent method of trussing and tieing a roof of moderate span is shown in the accompanying diagram. It is supposed that an attic, which may be made avoidable if desired, is provided above the regular upper story; therefore the walls are carried a foot or more above the ceiling joists, as shown in the diagram. On top of the wall, resting on band timbers, is placed a scantling, 2in. by 6in.—or of other suitable dimensions—on edge, with one end projecting over the building and forming a "lookout" on to which the soffit or planceer of the cornice may be nailed. The outer end of the "lookout" is cut off plumb, to the right length from the face of the wall. The inside end runs into the building far enough so that the end of it can be spiked to the stud as shown. These studs should form part of the side of the wall, and should be well spiked to the ceiling joists and set plumb before the "lookout" is nailed to it. After the studs, "lookouts" and joists are nailed together, the rafters may then be raised in place and spiked fast to the "lookouts" and to the studs, after which the collar beams may be nailed to the rafters, care being taken that they are placed to the right height to insure a sufficient space between them and ceiling joists to make a good room or rooms. The diagram is, to a great extent, self-explanatory, and is drawn to scale. The studding may be placed any distance from the wall, and if the building is of extensive span, the studding may also be attached to the collar beam as well as to the rafters. A roof built in this manner, if the work is well done, is very strong, and is not likely to be affected by the winds or by any ordinary snowstorm. If the roof is to be framed of heavy timbers, the same principles of construction may be adhered to, two joists being employed at the foot of the studs or struts, instead of one. The joists should be placed one on each side of the strut, and one or two bolts should pass through the joists and struts, and the whole three pieces drawn tightly together.—*Canadian Architect.*



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THE CRUCIFIX ABOVE THE ALTAR-SCREEN AT ST. ALBAN'S.

THE dedication of the altar-screen erected by Lord Aldenham in St. Alban's Abbey took place last Wednesday week. In the work so generously undertaken Lord Aldenham secured the services of the late Sir Arthur W. Blomfield, A.R.A., under whose direction the work of restoration has been so satisfactorily carried on by Messrs. Harry Hems and Sons, of Exeter. The screen itself is 42ft. high and 39ft. wide, extending from the north to the south side of the sanctuary. It is built entirely of clunch, a finely-grained white stone obtained from the quarries of Totternhoe, Herts. The majority of the statues—62 of them—are fashioned in yellow magnesium limestone, whilst those of Our Lord in majesty, attended by His twelve apostles, situated immediately over the altar, are of pure white alabaster. All the figures are rather over life size. They include the Virgin and St. John at the feet of the great central figure of the Crucified Lord, St. Helena, the Angel Gabriel, SS. Alban, Amphibalus, Erkenwald, Benedict, Augustine, and Stephen, and John the Baptist. The figure which has just been added represents Christ nailed to the Cross. It is a most imposing statue, measuring about eight from the crown of the head to the heels, and is carved from one block of magnesium limestone—the largest block ever raised in the celebrated quarries at Mansfield, and one that weighed no less than 10 tons. It is the largest sculptured representation of Christ Crucified in England. Below, in the panel above the Communion table, is to be inserted a representation executed by Mr. Albert Gilbert, R.A., M.V.O., of Christ rising from the tomb. This portion of the work, executed in Carrara marble, is not yet completed.

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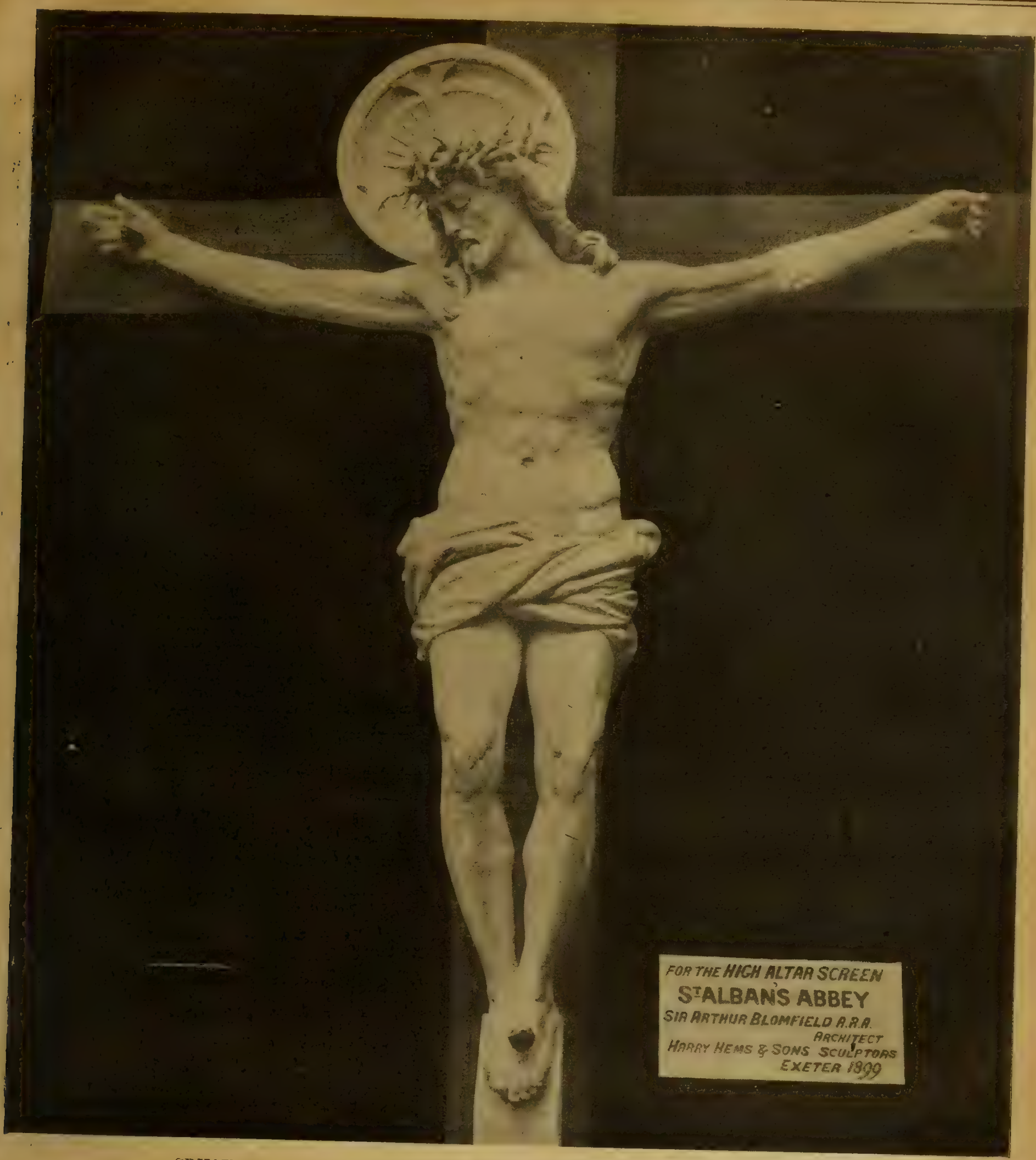
MIDLOTHIAN COUNTY BUILDINGS, EDINBURGH.—SELECTED DESIGN.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATIONS.]

THE style of Mr. Macintyre Henry's design adopted for these new buildings is Classical, of the period of the Later English Renaissance. The desire of the architect has been to produce a design of a dignified and monumental character, which, while harmonising with the buildings in Parliament-square and George IV. Bridge, should yet have a distinctive character of its own, the elevations having a dignity and simplicity which make them worthy of this prominent and historic site in the centre of Edinburgh. The principal front is to George IV. Bridge. Incidentally it may be mentioned that there will be an open area right round the building—a necessity imposed on the architect in order to give light to the basement floors. The elevation to George IV. Bridge has a total frontage of 155ft. This is divided into two blocks, the larger of which has a frontage of 120ft., and is three stories, or about 55ft., in height. This contains all the rooms necessary for the conduct of the county council business. In the smaller block, which is to the south of the other, is the justice of peace court-room, with police office below, its height being restricted so as not to interfere with the gable lights of the Signet library. The west façade of the county council block presents a varied outline, being broken up into three parts constituting a centre and side wings, the latter set back about 7ft. In the central block is placed the main entrance, which practically is on the street level. It is flanked on each side by double Ionic columns surmounted by a segmented pediment with carved tympanum, and a single window. Rising from a rustic base and passing through two stories are four Ionic columns in relief, which carry at the wall-head a projecting entablature and pediment filled in with carving. This practically constitutes a handsome and imposing balcony. Behind, and showing between columns, on the first floor, are three single-light windows framed in Ionic pillars, and surmounted by frieze and pediment. On the floor above are three windows, with moulded architraves and sills. In the side wings are three single-light windows on each floor of similar design to those of the central block. The ends of the elevation are finished with two projecting pillasters rising through two stories, and the elevation is finished off with cornice and open stone balustrade. The elevation of the J. P. block to George IV. Bridge shows a large three-light window, flanked by pilasters and surmounted by a segmental pediment and stone balustrade. The frontage to the High-street is about 55ft. Its prominent architectural features are Ionic columns and pilasters corresponding to the George IV. Bridge front, the intervening spaces being filled in with windows. The elevation to Parliament-square extends to about 105ft., and on this side the building is also three stories in height. The front of the basement is of rustic ashlar. The main feature of this elevation is the projection into the square, to the extent of about 20ft., of the central portion which contains the principal hall in the building—viz., the county council room, which rises through two floors. In the central part of this projecting portion, which is pushed slightly forward from what may be called its sub-wings, is placed the Parliament-square doorway. Over it on the first floor is a large and handsome three-light circular-headed window, with Ionic columns, cornice, frieze, &c. This is flanked on each side by two attached Ionic columns rising through two stories, and surmounted by a bold entablature and pediment with carved tympanum. Each of the sub-wings has a similar three-light window, and the corners are relieved by double projecting pilasters. The wall space between the


FOR THE HIGH ALTAR SCREEN
ST ALBAN'S ABBEY
SIR ARTHUR BLOMFIELD A.R.A.
ARCHITECT
HARRY HEMS & SONS SCULPTORS
EXETER 1899

CRUCIFIX FOR THE HIGH ALTAR SCREEN, ST. ALBAN'S ABBEY.

window-heads and the frieze is decorated with sculptured work. The side wings have each two circular-headed windows on each floor. Like as it is on the George IV. Bridge front, the wall on this side is also surmounted by frieze and open balustrade. The committee were, it is understood, not only greatly taken with the elevation, but were pleased with the manner in which the interior had been planned to suit different purposes for which accommodation is needed. The principal entrance is in the George IV. Bridge front. This gives access to a large hall 40ft. by 23ft., around which are grouped various public offices, such as those for the collector of rates and his assistants, the medical officer of health, the J.P. clerks, the inspector of weights and measures and the chief constable and his deputy. On the north side of the entrance hall rises in three flights the principal staircase, about 20ft. in width. It is carried to the first floor only, and is finished at the landing by means of a triple Corinthian arcade, which forms a feature in the internal decorations. There is also a subsidiary stair immediately adjoining the entrance hall, which is carried from the basement to the top floor, and is intended mainly for the use of officials. From the main hall a corridor extends eastwards to the Parliament-square entrance, and running southwards to the justice of peace court-room is a passage 8ft. in width. This court-room is 40ft. by 32ft. by 30ft. in height, and adjoining it are witness rooms, retiring rooms for the justices, and all other necessary accommodation. Between the principal block and the J.P. court-room is a subsidiary entrance which can be used by the public and others frequenting the court, and which practically makes the J.P. building independent of the other. On the basement floor, to which access is gained by the subsidiary stair already mentioned, are located rooms for the police and detective forces, a police sergeant's house, record rooms, cells, &c. This floor will be well lighted from the area. On the first floor, the landing of the main staircase is about 25ft. by 20ft. In it an open well is formed, with handsome stone balustrade, to give light to the hall below. Entering from the north side of the landing is the council-chamber, 46ft. by 30ft., amply lighted by the three-light window to Parliament-square, and by single windows on the north and south sides of the projection. It has been placed in this position so as to be away from the noise both of the High-street and George IV. Bridge. Its north wall will be 25ft. back from the High-street front. Adjoining the council-chamber are rooms for the county clerk and his assistants, with waiting and cloak rooms, and a large committee-room, 26ft. by 20ft., which communicates direct with the council-chamber. This committee-room is on the east corridor. On the opposite side of the corridor, and overlooking George IV. Bridge, is another committee-room, 30ft. by 20ft., a writing-room, 20ft. by 16ft., and a spare room; while overlooking the lane between the county building and the Signet library is lavatory accommodation for the whole floor. A feature will be made of the treatment of the interior of the council room. The walls will be relieved by means of pilasters, flanking the doors and windows. They will be panelled with wood to the height of 15ft.; there will be a handsome cornice, and the roof will be coved and elaborately panelled. The staircase and landing will be lighted from the top by a circular cupola, with doomed and panelled ceiling. The ceiling of the first-floor landing will be divided into panels, five of which will be filled with stained glass, while other four will be utilised for ventilating purposes. On the second floor are rooms for the road surveyor and the sanitary inspectors, the caretaker's house, two spare rooms, and lavatory accommodation. There will be a lift, rising from the basement to the top floor. The total cost of the building will be £40,000. A beginning with it will be made in the spring, and the work will be continuously prosecuted until finished, which will be in about two or three years. (We shall illustrate the first premiated design in this same competition by Messrs. Scott and Campbell at an early date.)

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE sixty-fifth session of the Institute was inaugurated on Monday evening, when the meeting-hall at 9, Conduit-street, W., was crowded by members and visitors, the latter including many ladies. The new President, Mr. William Emerson, was received with a round of hearty applause on taking the chair.

THE LATE SIR ARTHUR BLOMFIELD.

The PRESIDENT said it was with the deepest regret and sorrow that he found his first words must be to announce the decease of one of their oldest friends and members. Only on the previous Monday morning he received a most kindly letter from Sir Arthur Blomfield expressing his intention of being present that evening, and mentioning that he feared Lady Blomfield would not be able to accompany him, as she would be visiting in Cheshire. But the same evening a Higher Power willed otherwise, and very suddenly he passed away. Their late friend Sir Arthur Blomfield was an ardent admirer of the Gothic style of architecture, and was one of the enthusiastic promoters of the revival of that style in the middle of this century. He was one of the school of purists, and in all his buildings there was manifest, as in his life, a strong element of self-restraint. Many of his buildings stood out from the current architecture of the day by their quiet refinement and the total absence of affectation. He evidently felt that eccentricity was not art, and he also strove to adapt his architecture to the requirements of the day. Among his works, the interior of Christ Church, St. Leonard's, might be cited as an object-lesson in its simplicity, stately dignity, and proportion. So also was the new nave of St. Saviour's, Southwark. He became a Fellow of that Institute in 1867; he was a vice-president from 1886 to 1889, and he would have been president some years ago had he been willing to accept the office; but he felt that the claims on his time would be more than he could spare. He was the stamp of man produced by the old schools of architecture, now fast dying out; and, apart from his high professional *status*, his modest and genial nature, his conversational powers, his kind and generous friendship, always willing to aid younger members of the profession with the fruits of his experience, endeared him to all who knew him. His death was a great loss, both to the architectural profession and to that Institute.

The secretary, Mr. W. J. LOCKE, having read a translation of a letter from Mr. Charles Lucas, expressing his regret and that of his *confrères* in Paris at the death of Sir Arthur, and referring to the courtesy and help afforded by him during the International Conference of Architects in 1891, a vote of condolence and sympathy with Lady Blomfield and family was agreed to on the motion of the PRESIDENT.

Mr. ALEXANDER GRAHAM, hon. secretary, also announced the deaths of Mr. Thomas Elworthy, Fellow, and Mr. Henry Hockaday Burnell, Asociate.

The PRESIDENT said they had also to deplore the death of Mr. William Simpson, Hon. Associate, who had read several papers on Indian Archæology in that room, and was always willing to place his great learning on Oriental subjects at the disposal of the Council. He proposed that a letter of condolence be sent to Mr. Simpson's family, and this was agreed to.

Mr. GRAHAM announced that an examination for competency to act as district surveyor was held on Oct. 26 and 27. Two candidates presented themselves, of whom one, Charles Archibald Daubney, 1, Wellington-road, Peckham, passed.

THE OPENING ADDRESS

was then read by the PRESIDENT. In the course of his introductory remarks Mr. Emerson said the list of members of the Institute pointed to considerable and satisfactory progress in its affairs since its inception. In 1837 they had 96 Fellows and Associates, of whom 15 only were country members. In 1887 they had 1,109 members, of whom 259 Fellows and 435 Associates were from the metropolis, and 169 Fellows and 246 Associates from the provinces. In 1899, since the federation of the country societies with their own London body, their number had increased to 1,612, of which 290 only were Fellows from the metropolis, while 328 were from the provinces, and 552 London Associates, and 442 from the country. The number of societies in alliance with them in England, Scotland, Ireland, and the Colonies was 17. These figures showed that the old reproach of that Institute being merely metropolitan could no longer be cast at them, but that it had now attained a national character and influence, as much appreciated by the members of the profession in the country as in London. The work also of the Institute was increasing each year in importance, making its opinions heard and felt in respect of many important public questions relating to architecture. The conservation of our national monuments, building projects both for the metropolis and provinces, the laying out of new streets and town improvements, legislative acts in relation to building operations, the representation of the Institute on many public bodies and committes where questions affecting architecture or buildings might arise, the conduct of competitions, the promotion of the education of architects by annual examinations, the presentation of annual prizes and medals, were some few of the subjects constantly dealt with by the Institute. Moreover, the Government at times did not hesitate to consult them on questions connected with public works. All these were fair proofs that the sixty-five years of their existence as a Royal Society had not been altogether wasted from a public and national point of view, apart from matters more immediately connected with the interests of the profession at large, and the future of architectural development. And the extending influence of the Royal Institute of British Architects seemed in no danger of languishing, if one could judge by the vivid interest taken in its working and actions by the junior members, who yearly evinced a growing desire to have more voice in its affairs. In respect to this point the President mentioned that the Council had had under deliberation at the end of last session what steps could be taken under the Charter to associate the younger men more directly with the work of the Council. Amongst other things it was decided to remove all restrictions as to the eligibility of associates for seats on the Council. Also, with a view to extending their sphere of influence a congress would probably be held in London this session, and in Glasgow in 1901, at the time of the Exhibition.

A REVIEW OF THE CENTURY.

The President proceeded: At certain periods in the lives of individuals it seems fit to review with a critical eye the actions of their past lives. So at the wane of a century notable for its progress in knowledge, culture, and civilisation, it may be opportune for us as architects to glance back and see if any advance has been made in our art, and whether our efforts have been conducive to the benefit of mankind, and the glory of our country through the part the Institute has played during the last sixty-five years in the furtherance of our national interests so far as they are effected by architecture. There are several reasons why, during this century, great architectural developments might reasonably have been expected. It has, on the whole, been eminently peaceful and properous, and rest, quiet, and prosperity seem essential to growth in the arts. At the close of the eighteenth century and the beginning of the nineteenth Europe had passed through a crisis unparalleled in its character and effects in history. Taxation was heavy, commerce stagnant, and there was little demand for labour. Our impoverished and tired country was eager for peace, and only too glad to turn its attention to home politics and peaceful pursuits. Then the experiences of the French Revolution taught England lessons which resulted in provisions for the more direct representation of all classes of people in the government of the country, and the Commons became the people's House of Parliament. The more direct representation of the people tended to the furtherance of utilitarian and humanitarian projects. The humanitarian feeling of the age for the poorer classes was shown by the abolition of the slave trade. This feeling found farther expression in such measures as the formation of new poor laws, factory legislation, school boards, prison laws, asylum boards, national training schools of art, railway bills, building acts, and county councils. All these have in many ways provided opportunities for architects, and largely affected architecture. But in most buildings for humanitarian purposes architecture has been hampered by the many necessary laws relating to sanitary matters, such as the relation of light area to rooms, superficial floor space and cubic air space, heating, ventilation, and drainage. Whether architecture as an art has been improved by these conditions is questionable. From the utilitarian standpoint, Committees and Boards seem universally to affect architecture in an adverse manner; in fact,

ÆSTHETICISM AND UTILITARIANISM

appear to be always antagonistic. But surely a properly-educated body of architects should be able to reconcile the two. As well as from peace and the peaceful politics of the century, an advance in architecture might reasonably have been looked for from the influence of the increase of knowledge, our modern facilities of travel, the scientific discoveries and inventions, resulting in an enormous influx of wealth; also from archæological research, and the desire for culture, from literary and artistic productions in books, journals, and publications which have educated the taste of the public and also influenced that of architects. Looking at past history, art seems to have acquired fresh vigour and life, and made greatest strides at periods of learning and culture during years of independence and peace succeeding great wars or troublous times. These latter have often lent inspiration afterwards to architects and sculptors for the adornment of buildings, and given a living interest to their work.

THE FINEST ARCHITECTURE THE GROWTH OF CENTURIES OF EVOLUTION AND STUDY.

Some critics decry our present architecture and say it often shows little taste and no advance in art or style. But they should recollect that the highest level of the arts of any of the periods above mentioned was not arrived at in a day, nor did their architecture leap to perfection in a decade, and certainly architecture then could scarcely have had to fulfil the complicated requirements which make modern architectural problems so difficult. The Parthenon was erected the best part of half a century after Platea. The best of Roman architecture was not evolved till long after the battle of Actium; nor did the best phases of Gothic architecture appear until after many centuries of patient endeavour. Also more than two centuries succeeded the rise of Mohammedanism before its literature and scientific knowledge developed, or its architecture resulted in the Mosque of Toloun. And many more passed before the erection of the tombs of the Caliphs, and before the elaborate refinements of the Alhambra and the perfect beauty of the Taj Mahal were arrived at. It took one hundred years of learning and study, initiated by the Humanists (who saw that, apart from the theological training of Mother Church, culture and scholarship are inseparable from true human greatness), to usher in the Italian Renaissance; and then a further century of study of Greek and Roman methods, and of experiment and invention elapsed during the Quattro Cento (of which the Hybrid Classic and Gothic of the Certosa at Pavia and the Cathedral at Como are exemplifications between the rise of Brunelleschi, the erection of his Pitti Palace, and the dome of the Duomo of Florence, and the time of Bramante, Michael Angelo, Raphael, Giulio Romano, Peruzzi, Sansovino, Palladio, with the production of such works as the dome of St. Peter's, the Chapel of the Medici, the Villa Madama, the Library of St. Mark's, and other works of the best period of the Renaissance. Is there any reason for thinking that this history of an advance in, or a renaissance of architectural art, is in any way being repeated in our time, or that with the unexampled wealth and prosperity of this country during the last hundred years there has been a stirring of the dead bones of architecture, and that we may even now be travelling towards the goal of a development of a fresh expression of English thought, and an

EVOLUTION OF A NEW MODERN STYLE

that some day may be no disgrace to our Empire? Possibly this might be answered in the affirmative, but what the evolutions of our present methods may become remains to be seen. At the end of last century the renaissance of the Cinque Cento, which a century or more later found expression in this country through Inigo Jones and Wren, had for years been in its decadence, and was at a very low ebb in England. The ascendency of classicism in our public schools and universities, where Greek and Latin were taught to the exclusion of modern languages and science, naturally had its influence on architects as well as on the general public, and resulted in a revived interest in Greek art and the study of Grecian architecture. This was encouraged and assisted by the researches and publications of Dawkins and Wood, and Stuart and Adams. But though in the first quarter of this century the antique was the fashion, mere reproduction was sufficient for work which was inevitably devoid of life. Greek and Roman façades or porticoes were attached to modern structures, ancient designs were reproduced irrespective of their suitability to modern requirements—sometimes effectively, but always incongruously. The British Museum, St. Pancras' Church, and many of the churches with Doric and other Classic porticoes, and town-halls of this period illustrate this. After the first twenty years or so a more intelligent use was made of Classic forms and details. It was then sought to give some expression to the specific purpose of each building, and some of our architects, following the methods of the Renaissance, begain to use the borrowed details of Greece and Rome as a means to an end, and strove to adapt them more intimately to modern wants. The best works of Barry, Wyatt, Cockerell, and some others prove this. Also the printed works of Stuart and Revett, Cockerell and Penrose showed the real meaning of Classic architecture. It is sufficient for the purpose to name some of the most prominent of our Classic architects and their works. Amongst them were Decimus Burton, Soane, Nash, Wilkins, Basevi, Smirke, Wyatt, Barry, Cockerell, Elmes, Pennethorne, Cuthbert-Broderick, Gibson, of many of whose buildings we are proud. As examples of some of these works may be named University College, the Fitzwilliam Museum, Cambridge, Bridgewater House, the Queen's Mews at Buckingham Palace, the Taylorian Institute at Oxford, the Travellers', Carlton, Reform, and Athenæum Clubs, the Royal Exchange, Regent-street Quadrant, the Royal Institution and High Schools at Edinburgh, the St. George's Hall, Liverpool, the Leeds Town Hall, the London University, Burlington-gardens, and our much-maligned National Gallery, which the late Lord Leighton said "had often been made the butt of curiously unmerited ridicule, though it is much easier to deride than better it." Also the Union Bank, Bishopsgate. Such buildings as these show that a distinct revival of Classic architecture arose in this country during the second quarter of the century, and how great an influence classic education had upon men's minds, there being no recognised national style in which all were constrained by public sentiment to work. In fact, Classic architecture appeared to be well set in public estimation with considerable chance of becoming the national style. Still, however greatly we may admire these works, they are wanting in the real life and interest found in the best buildings of any style, whether Greek, Roman, Gothic, or Renaissance. In many respects they were unsuited to modern conditions and environments, and they bear no hint in their sculptured adornment of our country's history or life, and are thus devoid of one of the most vital and essential elements of good architecture. It has been suggested that ornament is not architecture, but a very subordinate and non-essential part of it. On the other hand, Ruskin has said that structures without beautiful adornment are mere buildings and not architecture. The truth may lie between the two; but it is certain that the best architecture has always been intimately allied with sculpture, which invariably lent it its most vivid and living interest. Apart from the more important buildings of this earlier half of the century, much cannot be said in favour of the domestic and, more common buildings of these years. Stucco was predominant, it hid a multitude of sins, and, compared with the better built and simpler style of the domestic and cottage architecture of the last and earlier centuries, there was nothing to boast of. In ecclesiastical work, the Gothic style was used concurrently with the Classic for secular purposes, but mainly of a late or Perpendicular period, and producing a cast-iron effect, rather than exemplifying the spirit of good Mediæval examples. Then came a different phase in the architectural thought of the century, which was almost the death-blow to the Classic revival. There were many elements at work which produced the awakening of interest in Mediæval art, and which caused Classic to be almost superseded by Gothic architecture, at any rate, for a time. The discovery of steam as a motive power, for one thing, had caused a great influx of wealth and ease of travelling, resulting in a wider knowledge of the architecture of other countries, and of past styles. No modern movement has been more influenced by literature than

THE GOTHIC REVIVAL.

Horace Walpole may have been a fribble; but he had a firm though uninstructed faith in Gothic. Beckford, the author of "Vathek," spent much money on what he conceived to be Mediæval art, while Sir Walter Scott both built and wrote Gothic as he knew it. Then about 1835 Pugin published his "Contrasts," a vivacious and most sarcastic criticism on Pagan methods of architecture compared with Mediæval or "Christian." In 1841 his Apology for the Revival of Christian Architecture was published, and other works followed, full of ardent enthusiasm for the resuscitation of severe Mediævalism, particularly in reference to ecclesiastical structures. Ruskin's writings also greatly influenced not only architects, but their religious tone appealed to the public. At first, though, they were too strong meat for babes, as was shown in much Gothic work done shortly after. For example, owing to some remarks of his on the value of the outlines of the openings of traceried windows being more important than the details of the moulded stonework, the very coarsest plate tracery was erected, in exemplification of this truth, and for the economy in labour in refined mouldings. He powerfully pointed out the beauties of Gothic work, and urged the necessity for the living interest of good and meaning sculpture in noble architecture. The publication of other works on Mediæval art and architecture by Rickman, Pugin and Le Keux, Scott, Parker, the Ecclesiological Society, Nesfield, Street, Shaw, Butterfield, Burges, and others, also Viollet-le-Duc's "Dictionnaire Raisonné," with its magnificent analysis of the scientific construction of Gothic work, put this style in an altogether new and entertaining light before the student. It increased the attraction of thoughtful men to the beauty, science, and detail of the Gothic styles. I can well remember whilst a pupil with Burges the intense excitement caused by the arrival of each fresh part of this work. Added to this, the Oxford Movement and the societies it gave rise to for the resuscitation of disused ecclesiastical forms and ritual caused the study of ancient Church architecture and arrangement to be taken up by the rising clergy and others at the universities, who henceforth were careful to go to the most capable architects of the Gothic school. This movement also provoked greater enthusiasm amongst the architects themselves. Then ensued

THE BATTLE OF THE STYLES.

The ardent enthusiasm of Gothic men for a revival of Mediæval art and architecture, which blinded them to the beauties of Classic, and the persistent denunciation of the severe Classicists, who could see no merits in Gothic, gave good grounds for the vigorous diversion of opinion which raged during the middle years of this century. Gradually, however, the Gothic school seemed to gain an ascendency, which lasted until the seventies. There were, however, architects practising in both Classic and Gothic, according to the tastes of their clients. Wilkins practised in both styles, and the best work the Italian Barry produced was perhaps our Gothic Houses of Parliament. At first the Early 13th and 14th century English work was the admiration of these Gothic partisans; then Viollet-le-Duc's works brought Early French into fashion, as being larger and grander in effect. Later on, entire satisfaction not being derived from these (they were too simple and pure for the complicated environment of our many-sided lives), Decorated and Jacobean each had their turn. Amongst the works of this Gothic awakening, but mainly in ecclesiastical buildings, those of Pugin, Scott and Moffat, Pritchard, Paley, Butterfield, Street, Burges, Godwin, Pearson, and I may now add the name of Sir A. Blomfield, are the most prominent, and others, some of whom are still alive. It was in the forties that Pugin built his own house and church at Ramsgate, the only work, I believe, he said he ever really enjoyed doing, and this because he was unhampered by a client. A little later he rebuilt Alton Towers for the Earl of Shrewsbury, and St. John's Hospital, Alton. He also erected or restored some forty or more churches and cathedrals, some twenty conventual and a number of domestic buildings. But the work which perhaps added most to his fame was the assistance he rendered in the working out of the intricate and refined details of Sir Charles Barry's sumptuous design for the Houses of Parliament. To my mind it is a fine combination, Classical in its symmetry and horizontality, and Gothic in its picturesque outline and detail. In many respects it is the most notable building erected in England during this century, and to many it must be a matter of congratulation that our great Houses of Parliament should have been designed in a national English style of architecture rather than in the more monumental Classic. At any rate, whatever our views as to style may be, it stands as one of the most complete and best buildings of modern Europe. Of the men of this period, Sir Gilbert Scott stands out pre-eminent—not so much, perhaps, on account of any very particular individuality or extraordinary excellence in his works—though at the time they were extraordinary—as from the great part he played in the revival of this period, his enthusiastic zeal, and the establishment of what one might almost call a school of Gothic architecture, caused by the enormous number of works carried out by him in the erection and restoration of churches and cathedrals, and the training of a staff or school of young men sufficient for the purposes of his enormous practice. But for the overbearing attitude of Lord Palmerston, we might have had from Sir Gilbert Scott in the Foreign and Colonial Offices a building which would have been as grand a success as the Houses of Parliament. However critically we may examine, at the present day, the works of these great men, we must always remember that the advantages of our time in easy travel, access to architectural libraries, and the multiplicity of illustrated works on all branches of architecture now open to us, and the enormous increase during the last fifty years of archæological works, were not experienced by them. They were not smothered by learning as we are; they had to find out for themselves that which we can learn easily from others, and with more limited knowledge than the student of these days ought to possess, they worked energetically and earnestly for the resuscitation of our indigenous style of architecture. Further, however much the methods adopted for the preservation of our national monuments may be cavilled at—and criticism is often captious—had it not been for the men of this period, many of these buildings would have been by this time well on the road to irretrievable ruin. To them, therefore, members of this Institute, and men who gave much time and thought to its working, not only our gratitude, but that of the nation, is due. In some respects, perhaps, William Burges was the most original of the purist school of Gothic architects of this revival period, and the most deeply imbued with the Mediæval spirit, and the most familiar with its art and craftsmanship. He also insisted that architecture was not worthy of the name if it did not tell some tale, historic, poetic, or otherwise. He also urged a point which seems to have been lost sight of in these later years—namely, that all architects should learn to draw the human figure and design their own sculpture; at least, as to grouping and arrangement. His competitive design for the Law Courts, if not the best, was certainly the most monumental and notable of the Gothic ones submitted. His work at Cardiff for the Marquis of Bute, and in his own house in Kensington, in Cork Cathedral and Studley Royal and Ripon Churches, shows a genius for the invention of interesting and beautiful detail in the true Mediæval spirit that no other architect of this age has approached. Street was one of those who saw that ecclesiastical architecture should meet also the requirements of modern times—that large churches should be adapted for congregational purposes; and it is instructive to note his endeavours to connect a wide nave with a narrow choir—not always successfully, as at Bournemouth, where he canted the easternmost bays of the nave inwards, causing a pinched effect just where an open and spacious area seems to be demanded. His works, whether ecclesiastical, public, or private, were always interesting from the vigorous personality impressed upon them, and this was always apparent in his early works, as in the church at Garden-street, Westminster, in the later and much more refined one at Vassall-road, Kennington, in the house he erected for himself at Holmbury St. Mary, the mansion in Cadogan-square, and in the Law Courts, which was the last great effort of his life. These Law Courts unfortunately seem to have given

THE DEATH-BLOW TO GOTHIC.

It was not the fault of the architect so much as that of the building committee, who seem to have been determined to have a large central hall. Accordingly designs without this feature were discarded, notwithstanding that this waste of space, useless also as a foyer to the courts, deprived the building—to which an insufficient site had been appropriated—of the last chance of obtaining light and air to the corridors. The plan of this building may not be all that could be desired, but that is hardly the fault of the style of architecture, though from this fact it has been argued that Gothic is unsuited to modern requirements. Of the other notable figures in this revival of Mediæval architecture I will only mention one. All were working for the same end, though often on slightly different lines and with varied success as to the quality of their work. In referring to the late Mr. Pearson, I will only mention his last and his best and most beautiful work—namely, Truro Cathedral, and simply to point out what was certainly one of the failings in the methods of the Gothic revival. Truro is a modern cathedral intended to serve modern needs, but it appears to have been designed with a view to reproducing a Mediæval church, whose plan was originated to meet requirements of other ages—entirely different from those of to-day. There can be no doubt that for congregational purposes in these days, and for worship in which all can join, a central tower on piers blocking up the best part of the internal area is a sad mistake, and inexcusable unless a particular object of our church building is to erect in plan and detail Mediæval structures that in future ages may deceive the inquiring archæologist. This was not the spirit of the men of the Italian Renaissance. But it is useless to attempt to specify the characteristics or buildings of each of the notable men of this Gothic revival period: their best works are known to us all. However adversely faddism or conceit may criticise many of them, it cannot but be felt that they greatly redound to the credit of the architects of this period, and also add the greatest interest to the history of the architecture of the century. Since the seventies hot enthusiasm for a resuscitation of any definite style of Gothic seems to have smouldered and died, and to have been succeeded by

A PERIOD OF FLIRTATION WITH ALL STYLES

of architecture. Byzantine, Moorish, Romanesque, Queen Anne, Dutch, French Renaissance, and even Egyptian have each had their admirers. The plain and severe, the rococo and ugly, the picturesque and grotesque have all been tried—all being the result of the study or copyism of debased deductions from those original styles which inspired the greater Classic and Gothic architects of the second and third quarters of this century.

THE STUDY OF THE PUREST EXAMPLES

of art or architecture must be the best tuition; if we endeavour to emulate the debased, our work will be on a still lower grade:—

> "Noble souls
> Still find the base is hurtful, and the good
> Is full of glory."

I have heard of an architect saying he adored drawing a piece of impure detail, and another that he delighted in designing something that would give a shock, and their works proved the truth of their remarks. Such sentiments, however, can arise only from an ill-regulated fancy or from a vulgar desire to attract attention, and cannot lead to great results. The overloading of detail and ornamentation is again another phase of a similar feeling. Many of the so-called adornments of modern buildings are not only not indispensable, but positively detrimental to the dignity of architecture. Nevertheless, these later years have been marked by a keen study and most enthusiastic interest in, and desire for, the good and beautiful in architecture, with an earnest attention and effort to discover the right adaptation of known (and sometimes unknown) architectural forms to the manifold and complicated requirements of the time.

THE COMING STYLE.

In looking back, then, generally at the architectural work of this century, what evidence is there of there having been, or being, any revival of architecture in any way similar to those of past periods? Sir Gilbert Scott once said in these rooms, in reference to the earnest enthusiasm of the middle of the century for a resuscitation of our English Gothic architecture, that no parallel to it had occurred since the Italian Renaissance, and I believe he was right; and further, I believe that we are at the present moment in course of an evolution in art that may in time result in a uniform national style. And for the following reasons: During this century there seemed to have been three fairly distinctive periods. In the first the Classic style was zealously cultivated; in the second the resuscitation of Gothic was passionately preached; in the third, no one style has predominated, but there has been a restless searching and craving for something that shall satisfy the conditions and requirements of modern life. In the first period, though Classic teaching led to the study of, and desire for, a revival of the antique, it was differentiated from the movement in Italy of the 15th century by so many of our architects subordinating modern requirements to a clothing of ancient examples reproduced for the purpose rather than designing in ancient methods with an individualistic treatment suitable to the occasion. This arrested true progress. It therefore failed in altogether impressing the nation with its suitability for English 19th-century architecture. Nevertheless, there was in the movement a zeal for stately and noble work, and it was this desire which caused the founding of the Royal Institute of British Architects as one means for the attainment of the end. The second period, with its thirst for knowledge and culture and facilities for education, certainly evinced a similar feeling to that which found expression in the Humanists of the 14th century in their insistence on scholarship and culture being necessary for the elevation of mankind. In their case it was apart from, rather than in conjunction with, theological teaching, while in this century, notwithstanding the broad views and freethinking tendencies of the age, it has been side by side with a distinctive religious awakening, which started and then kept alive the interest and desire for a revival of Mediæval art, under the plea that it alone was Christian. This mid-century Gothic movement began with ecclesiastical architecture, and extended itself to civil work also. But it failed as did the Classic movement in establishing itself as a recognised national method or style, and for somewhat similar reasons. A slavish copyism was engendered by reason of the scorn cast by the purists on detail inexact in its reproduction. To this school it seemed of more importance that every portion and detail of a modern Gothic building should have its precedent in the Middle Ages than that, as a building, it should exactly meet modern needs. This arrested individualism and thoughtful adaptation of the Mediæval methods to our complicated modern wants. It was exactly (with some exceptions) the reverse of the principle which actuated the sculptor-architects of the Italian Renaissance. They adopted antique methods and details, and with original ingenuity pressed them into subserving their plans, not permitting them to dominate the requirements of the time. Nevertheless, there was in this Gothic movement the evidence of life and a distinctive and ardent striving after more architectural light and a national general style.

ENGLAND OWES MUCH

to the men who led our Classic and Gothic schools, and one can but feel that Fergusson's severe criticisms on their works are harsh and unjust. From his remarks it might be supposed that they used no brain power whatever, but simply copied, nor cared to do more than copy. He argues as if it were to be expected that a perfect style suitable to all our complex modern life could have been attained at one jump. We know that long periods, centuries even, are required for such an evolution. He seems to have thought that their first efforts should have reached the highest levels. A more reasonable view is that the copyism he denounces was but the first step in a legitimate process of development. Both by the Classic and Gothic purists of this country that step was honestly taken. In this the third distinctive period of the century we see architects abandoning purism, and betaking themselves to an eclectic treatment of the two great branches of style. May we not hope that along this line a national architecture may eventually be reached, at once good in an artistic sense, and flexible and useful from a practical point of view? An analogous phase was gone through in the Early Renaissance. Should this happen, I venture to think it will be found that the R.I.B.A. has contributed to it in no small degree. For the leaders of the movements indicated were members of our body, and we may justly congratulate ourselves on the steps we are taking to foster emulation of such excellent examples, for the careful and wide study of the rising generation of architects is fostered by it, and their keen interest is proved by the splendid results shown in this work produced under the incentives offered by this Institute in the presentation of medals, prizes, and travelling studentships for design, draughtsmanship, and for architectural research. Personally, I have a strong conviction that the evolution of a sound architectural style must be accompanied by a development of

THE NEGLECTED ART OF ARCHITECTURAL SCULPTURE.

At all the best periods of architectural development, the sculptured adornments of the buildings (except where religion forbade, as amongst the Mohammedans) told their history. Have we, with our enormous Empire, nothing to record! Or is it owing to inability, indifference, or parsimony, that our life and history find no place in our architecture? Or does the crushing weight of the utilitarian element overwhelm artistic effort? Our Houses of Parliament have some forty or fifty statues of kings, &c.; the sculptured subjects suggested in Scott's Foreign Office design and Street's Law Courts were pruned away by the Government. Our huge railway stations and commercial and domestic buildings show nothing but meaningless ornament. Will our new Public Offices illustrate in any way the growth of her Imperial Majesty's dominions? Or is the country too poor or indifferent to give our sculptors such a chance? Is it not impolitic of a Government in these discontented days to discourage the development of a craft the highest in art, which elevates public spirit, gives employment to a large class of the most intelligent workers, and at the same time raises the standard of architecture, and enhances the glory of a country? Frankfort has lately started a fund, the income from which is to be spent in the adornment of the town with sculpture. This shows the increasing feeling there is in the cultivated world for such a step. Why cannot we do likewise? However, sculpture is a detail of refinement and adorment, and, if architects would suggest it properly and wisely, it might possibly more often find place in our buildings. But aid from sources external to architects is needed in other ways if a national architecture is ever to be arrived at.

WANTED, AN ÆDILE.

London seems practically in process of rebuilding in its main centres, and constant enlargement is taking place in the suburbs. Surely steps should be taken to prevent our new streets being eyesores instead of improvements, and to avoid the repetition of such a medley of incongruities and commonplaces as may be found in Shaftesbury-avenue and Charing Cross-road.

Architectural opportunities in these streets were afforded which, under proper control, might have had a magnificent result. Surely there should be some controlling power to settle the general lines, heights, and materials of buildings and style of design. That the London County Council has something to say as to construction and heights is true, but their purely practical conditions being complied with, anyone can build according as his own sweet will, taste, or ignorance may prompt. This cannot be the right method in a great empire for the fostering of a national art like architecture. Every man who builds in a public street has a duty to the public to perform. His building should not endanger the safety of the public, but neither should it be a shock to their sensibilities. Proper control should render it impossible for us to see such a thing as I noticed the other day—a dull red brick Renaissance house on one side of a bright glazed teapot ware pseudo-Gothic building, and a stone nondescript erection on the other—all of different heights, horizontality, and materials, while close by was another huge stone facade with heavy projecting columns and pediments, constructed surface ornament, standing apparently on nothing but sheets of plate-glass. Can anything be worse? Notwithstanding the modern shopman's requirements, architects should resolutely set their faces against such hideous uglinesses. In indifferent matters each man should have liberty of taste, if the indulgence thereof injures neither himself nor others. Individualism is needed in art; but if the imagination or individuality be only a mark of undisciplined self and an offence to art, it is positively injurious in its demoralisation of public taste, and should be restrained. Were there a ministry of fine arts, with a committee of control under a chief whose qualifications were not only political, surely something might be done. The committee who were responsible for the Chicago Exhibition—a work which was magnificent in its effect, as all who saw it were agreed—was composed of architects and sculptors, who were charged with the erection and adornment of the numerous palaces. This committee settled the general style of buildings to be erected, the heights of cornices, floors, &c., and each design was submitted to the criticism of the whole committee, who passed it, or suggested improvements, which the architect was forced to consider. The result was grand and stately, such as those who did not see it can hardly realise. The Ministry of Fine Arts in Paris has such a controlling voice in all matters of public works, in laying out of the streets or boulevards, in the erection of public monuments, and even in their bridges. In France it is entirely out of the power of anyone to erect unsightly edifices in prominent positions to the annoyance of the artistic sense of the nation.

MORE LEISURE AND SOLITUDE FOR ARCHITECTS.

There is another thing that also affects our architectural design. We are always, in these days of greedy competition, in too great a hurry and rush. Art is long, and sufficient time for thought and quiet for solitary reflection is not afforded the busy architects of the day to properly solve the problems set before them. Designs for half a million's worth of building have to be prepared, submitted, and passed probably in, say, three months, and then the unfortunate architect is told that his designs are not equal to those of past ages. Ralph Waldo Emerson says: "We do not get enough of solitude, with the result that our minds are in danger of being vulgarised and of being unable to see things in their proper proportion." This is exactly what frequently happens to the architect of to-day: he does not get enough quiet for meditation. Let us hope that next century our architects, with their increasing wisdom which will enforce periods of rest for reflection and mental recuperation, and with higher cultivation which will improve taste, and under wiser auspices which, with an imperial spirit, will exercise an enlightened control, may develop a true style, sufficient for modern requirements and satisfying to æstheticism. As this goal cannot be reached by architects working on different methods and lines, and competing to outdo each other by differences or eccentricities of style, let us hope that we may, in a glorious enthusiasm for our art, be led to sink personal predilections in combined efforts to seek the true artistic adaptation of our architecture to modern needs, and that such efforts may in time elucidate a style suited to the 20th century, which, while allowing of individualism in the treatment of details, may have a general harmony, and at last eventuate in a distinctive national architecture, stately, dignified, and picturesque; an architecture that may enhance the glory of this great empire, and be a proof that the British nation is neither sordid nor penurious, but in its highest state of civilisation may become capable of emulating the best art history of past ages.

Mr. J. MacVicar Anderson, past-President, proposed a vote of thanks to the President for his admirable and thoughtful address. They had heard a masterly review of the architecture of the past century, full of research, broad in its scope, and entirely free from illiberal and sceptical opinion. He ventured to suggest that when calling attention to the increasing proportion of provincial members of the Institute the President might have gone further and referred to the growth of colonial representation on the roll, which now numbered 78 architects practising in our colonies and dependencies. One other omission was that of allusion to the financial status of the Institute. When the speaker had the honour of occupying that chair its position in this respect was not altogether satisfactory, but during the last few years had been much more encouraging. In 1896 there was a balance to the good of £571, in 1897 of £1,116, and last year this surplus had risen to £1,241. He would press upon the Council the desirability of continuing to live within their income, so as to accumulate funds, say £15,000 or £20,000, for providing a more worthy home for the Institute. If they glanced forward they would see no reason to anticipate a check in the present marvellous growth and extension of the suburbs, and if that continued the central thoroughfares would urgently demand reconstruction on wider lines, affording much employment for the architect of the future. He hoped ere long the period of flirtation with various styles to which the President had alluded would cease, and that, wedded to the staid Classic, the stern Gothic, or some chaste, purist style, architecture would settle down and produce a worthy progeny, thus realising the ideals of the President. As to the suggested Minister of Fine Arts, he had no faith in anyone, however distinguished, appointed temporarily for political reasons, but should have great hopes for the usefulness of a permanent and independent official.

The motion was seconded by Mr. Joseph Smith, President of the Sheffield Society of Architects and Surveyors, who observed that he could not agree with the President in anticipating that a national style could be produced by any definite effort to evolve it; if it came at all, it would only result from simply trying to solve the practical problems of the day in the most artistic manner.

Mr. F. C. Penrose, F.R.S., past-President, supported the vote of thanks, which was passed by acclamation and briefly acknowledged by the President, who explained that he did not look forward to any immediate evolution of a new style but as the result of some definite effort; all his remarks had tended to suggest that the national style, if they ever had one, would require a lengthened space of time to develop, and possibly another century might elapse before its appearance.

THE LATE SIR ARTHUR BLOMFIELD.

The funeral of the late Sir A. W. Blomfield took place at noon on Friday in the churchyard of Broadway, near Eversham, where the deceased had a county residence. The Rev. H. Russell Wakefield, rector of St. Mary's, Bryanston-square, officiated, assisted by the rector of the parish. The family mourners included Lady Blomfield, the Misses Blomfield (three), Mr. C. J. Blomfield, Mr. A. C. Blomfield, Mrs. Gurney, Mr. Reginald Blomfield, Mr. Frederick Blomfield, and Captain East, and there was a large gathering of the clergy and laity of the neighbourhood. A large number of crosses and wreaths were placed on the grave, among the donors being Lady Lucas, Mrs. Sopwith, Mr. Alfred Gilbert, R.A., Mr. Alfred Parsons, A.R.A., Mr. T. Davey, Captain Dicken, the Royal Academy, the Royal Institute of British Architects, and many well-known Churchmen, clerical and lay.

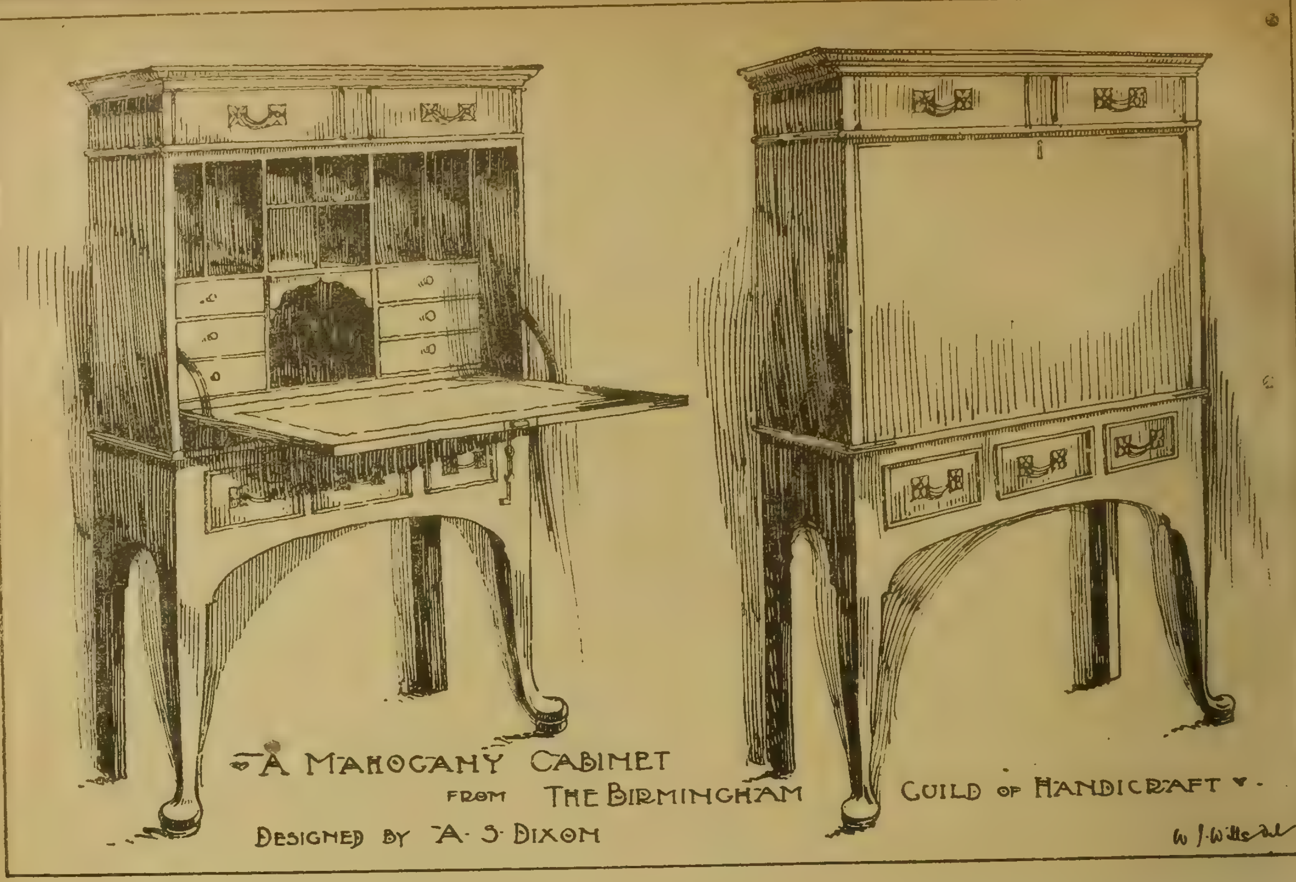
A memorial service was simultaneously held at St. Mary's Church, Bryanston-square, W. Among the numerous congregation there assembled were Sir John Taylor, K.C.B., late of H. M. Board of Works, Sir William Robinson, Sir James and Mr. Henry Blyth, the Archdeacon of Maidstone (representing the Dean and Chapter of Canterbury), Canon Duckworth, Canon Hervey, Canon and Miss Routledge, Mrs. George Blomfield, Miss Blomfield, Mr. William Emerson (President R.I.B.A.), Prof. George Aitchison, R.A., (ex-President), Mr. Alexander Graham (hon. secretary), Mr. W. J. Locke (secretary), Mr. C. Lock Eastlake (a former secretary), and Messrs. Aston Webb, A.R.A., E. W. Mountford and Beresford Pite (members of Council), Mr. G. H. Fellowes Prynne (President Architectural Association), Mr. R. Phené Spiers, Mr. Frank L. Pearson, Mr. George H. Birch, Mr. Ernest Croft, R.A., Mr. Frank Dicksee, R.A., Mr. Kenneth Graham (secretary of the R.A.), Mr. W. W. Ouless, R A., Mr. A. Parsons, A.R A., Mr. Kenneth Graham (secretary of the Bank of England), Mr. S. Flamank (secretary of the Corporation of the Church-house), Mr. A. W. Pinero, Mr. John Richmond, Miss Richmond, Captain Malton, Mrs. Marcus Stone, Mr. J. T. Lee, Dr. Holman, Dr. Ogle, Mr. D. Irvine (secretary of the Arts Club), Mr. R. Barrett, the Rev. E. and Mrs. Lascelles, Mr. E. H. Martineau, Mr. Royds, Mr. John Leighton, Mr. G. E. Monckton, Mr. Thomas Peard, of the firm of Hart, Son, Peard, and Co., Mr. Gandy, the well-known quantity surveyor, and others. The service was conducted by the Archdeacon of London, assisted by the Rev. R. Dixon Box. In the course of an address, Archdeacon Sinclair said that Sir Arthur Blomfield stood with Ruskin, Pugin, Barry, Scott, Street, and Pearson in restoring Pointed or Gothic architecture as a science, with principles and laws of its own, instead of being, as it had been mainly in the hands of previous revivers, an imperfectly understood medley of beautiful details merely to be reproduced in ill-adapted imitation without system or proportion. His beautiful style was that thoroughly English one which prevailed from Edward III. to Elizabeth, though, as was shown by the Church of St. Barnabas, at Oxford, he could adapt himself to any style that was chosen. Probably no architect had built or restored so many churches, and there were few counties where he had not left evidences of his taste and skill. Hundreds of beautiful churches all over the country proclaimed at once, by the purity of their style, their admirable proportions, and their adaptation to their needs, that they were the work of Blomfield. The members of his family who were mourning his loss would at any rate have the consolation of knowing that their sorrow was shared by all who knew Arthur Blomfield. As the congregation dispersed the organist played "The Dead March" in *Saul*.

The Exeter Convalescent Home at Ockenden Villa, Waldon Hill, Torquay, was reopened on Friday after extensive renovation and alterations. The works have been carried out under the supervision of Mr. E. G. Warren, M.S.A., architect, of Exeter, Mr. R. F. Yeo, of Torquay, being responsible for the structural portion, and Messrs. Downe and Baker, of Exeter, for the sanitary improvements.

The Bishop of Beverley dedicated last week a vestry which has been erected adjoining the south side of the chancel of St. Olave's Church, York. The structure is in Late Decorated style, and is built of Tadcaster stone with traceried windows, open timber roof, covered with lead, leaded glazing, and metal casements. The floors are laid with solid wood blocks and the walls coloured. The cost of the vestry is about £450, exclusive of furnishing. The architects were Messrs. Demaine and Brierley, of York.

Work on the Turtipur Bridge over the Gogra River on the Bombay and North Western of India Railway is now making good progress. The site is 200 miles lower down the river than the Elgin Bridge, and the Turtipur Bridge will consist of eighteen spans each of 211ft. 6in. centre to centre of piers. At present there is some question with Government as to whether the intended height of girders above flood level (16ft.) should not be increased. The pneumatic plant for well-sinking has arrived.

The new board school at Parson's Green, the plans of which have been passed by the Edinburgh Dean of Guild Court, will be a three-storied building. The infant department will occupy the ground floor, and the juvenile department the other two floors. A workshop on a basement floor. There will be a central hall with galleries, which the classrooms on the upper floor enter. The style adopted is an adaptation of the Old Scottish style. The school, which will be heated throughout with hot-water pipes, will accommodate 1,400 children. The building will cost about £20,000.


A MAHOGANY CABINET
FROM THE BIRMINGHAM GUILD OF HANDICRAFT.
DESIGNED BY A. S. DIXON

MAHOGANY CABINET FROM THE BIRMINGHAM GUILD OF HANDICRAFT.

THERE is not much to say about this useful and artistically contrived piece of furniture, of which Mr. A. S. Dixon, architect, is the designer. The sketches herewith given show it in use and when closed. It has been excellently made in choice mahogany by the Birmingham Guild of Handicraft, of whose premises we gave a view and plan in the BUILDING NEWS for Nov. 3, 1899.

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The Blackburn Town Council have approved a proposal of the scavenging committee that the erection of new refuse destructors at Greenbank and Wensley Fold be at once proceeded with, and that £22,000 be raised on loan for the purchase of land and the cost of building.

With the exception of the bridges and ballasting, the excavation for the new loop-line at Wetherby, which will connect Leeds and Wetherby with Harrogate and the North, has been finished. The work has been in band for seventeen months, and has entailed the removal of almost half a mile of solid rock at a great depth. The bridge over the river at Collingham has also been finished. A commencement has been made of the excavation for the platform at the north side of Wetherby new station, but before the new station is erected Mr. H. M. Nowell, of Leeds, the contractor, has to remove part of the field which was used as a carriage-stand on the old Wetherby Racecourse. There is still some of the Leeds and Wetherby line doubling to finish, near to Crossgates and Bardsey stations.

A pulpit has just been set up in Sherborne Abbey as a memorial to the late wife of the vicar. The pulpit is executed in oak, with a marble and alabaster base, from the design of Mr. B. Ingelow, architect to the abbey. It is nearly octagonal in form. The panels are enriched with carvings and tracery. At each of the angles are eight figures, representing the Four Evangelists, and two each from the Old and New Testaments carved in oak. This memorial is from the studios of Messrs. J. Forsyth, of Finchley-road, Hampstead, who executed the reredos and chancel fittings at the restoration.

At the parish church of St. Paul, Wooburn, Bucks, on Sunday, the Archdeacon of Buckingham dedicated a chancel-screen, which has been presented to the church by Miss Emily Madelina Du Pre, in memory of her father and mother. The screen is embellished with the arms of Du Pre and Maxwell, also the arms of the dioceses of Oxford and Lincoln, the Province of Canterbury, and the County of Bucks.

OBITUARY.

WE regret to announce the death of Sir THOMAS NEWENHAM DEANE on Wednesday, in Dublin, at the age of 71. The deceased architect was a son of the late Sir Thomas Deane, an equally eminent architect. He was a Royal Hibernian Academician, Curator of the National Monuments of Ireland, and Lecturer on Architecture to the Science and Art Department in Dublin. He was knighted in 1890, on the occasion of the opening of the Science and Art Museum and National Library of Ireland, of which he was the architect.

MR. THOMAS JAMES FLOCKTON, F.R.I.B.A., F.S.I., head of the firm of Flockton, Gibbs, and Flockton, the well-known architects and surveyors, of St. James's-row, Sheffield, died somewhat suddenly at his country residence, Woodleigh, Worksop, on Tuesday morning. Mr. Flockton joined the Institute of Architects as a Fellow in 1888, and recently served a term of office on the council as the representative of the Sheffield Society of Architects and Surveyors, of which body he was past-President and Fellow. He had been a Fellow of the Surveyors' Institution since January, 1880.

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CHIPS.

The foundation-stones of a new Wesleyan school chapel was laid in Lovett-street, Cleethorpes, last week. The building, which will cost £2,400, is being erected from plans by Messrs. Gelder and and Kitchen, of Hull; Mr. W. Ion, of Cleethorpes, is the contractor.

The Bishop of St. Asaph consecrated, on Friday, a new church at Llandudno. The edifice was erected entirely at the cost of Lady Augusta Mostyn, Gloddaeth, in memory of her father and mother, the late Earl and Countess of Abergavenny, on a site given by her son, Lord Mostyn. The architect was Mr. Douglas, Chester, and the contractors were Messrs. S. Parry and Sons, Llandudno Junction. It consists of nave, aisle, chancel, and sacrarium vestries on north side, with organ above, and at the west end a baptistery under the tower. Accommodation is provided for 500 persons. All the windows are of stained glass, designed and executed by Messrs. Lavers and Westlake, of Endell-street, W.C. The peal of seven bells in the tower was cast by Messrs. Taylor, of Loughborough.

The First Commissioner of Works has appointed Professor W. H. Corfield, M.D., of University College, Consulting Sanitary Adviser to Her Majesty's Office of Works for the Royal Palaces and public buildings in charge of the department.

The Church of the Holy Nativity, Knowle, Bristol, has been further embellished by the insertion of a two-light stained-glass window, the gift of the Men's Guild of the Holy Cross, in memory of their departed brethren. The position is near the side altar of the church, the subject being "The Annunciation."

The completion has just been celebrated of a funicular railway up to the Schatzalp at Davos-Platz. It commences at the rear of the Kurhaus, and is about 2,200ft. long. The force used to propel the cars is electricity, which is generated in the valley near the ice rink by dynamos driven by gas-engines (an English patent), the mixture of air and gas being exploded not, as is usual, by a jet of gas, but by an electric spark. This is one of the first funiculars in Switzerland to use electricity as a motive power.

The present capacity of the Leeds gasworks is equal to a production of 17,250,000c.ft. per day. The maximum daily consumption last week was 15 million feet. There is, therefore, a surplus producing power over last winter's maximum sales of 2,250,000ft. per day, equal to 15 per cent. The new retort house to be erected at the York-street Works next year will increase the power of production by a quarter of a million feet per day, and this quantity, added to the present surplus, gives 2½ million feet per day.

Professor S. H. Capper, of Montreal, the new President of the Province of Quebec Association of Architects, is a graduate of the University of Edinburgh. In 1887 he was admitted by examination a student of the School of the Beaux-Arts, Paris. From 1887 to 1891 he practised architecture in his native city of Edinburgh. In 1891 he was admitted an Associate Member of the Royal Institute of British Architects, and shortly after became a university extension lecturer in connection with the University of Edinburgh. In 1896 he was appointed examiner in the faculty of Arts for the department of archæology and art history of this university. In the same year he accepted the position of Professor of Architecture in McGill University, which position he still retains.

One of the casual risks of pecuniary loss incident to the building trade was exemplified by an action tried before Mr. Justice Grantham in the Queen's Bench Division on Friday. A special jury awarded Mr. Lees, a commission agent, £250 damages for personal injuries he had sustained. The defendant was Mr. Henry Burke, a builder, of Newman-street, E.C. Plaintiff was on his way to the Constitutional Club, on the 11th November last, and in passing the Grand Hotel, a rough file fell from the window of an upper story, where a workman named Pepper, in defendant's employ was engaged, and struck him on the temple so severely that he was unable afterwards to continue his work.

Building Intelligence.

Kensal Rise.—The foundation-stones of a new Wesleyan church at Kensal Rise were laid on Nov. 2. The church is designed in the Decorated style of Gothic architecture, with nave, transepts, and organ recess; seating accommodation is provided for about 750, inclusive of galleries on three sides of the church. The front of the church has entrance doorway, with gables over, and a rich five-light tracery window. A tower and spire are placed at the north-west corner, rising to a height of 100ft. Three vestries are provided. The architect is Mr. W. J. Morley, F.R.I.B.A., of Bradford; and the contractor for the whole of the works is Mr. Wm. Gibson, of Exeter.

Metropolitan Asylums Board. — At the meeting of this board on the 9th ult., the Works Committee were instructed to consider and report upon a letter from the Local Government Board, in which the managers were urged to reconsider the board's proposals that two-story instead of one-story buildings should be adopted at the proposed Southern Hospital for the accommodation of the 720 ordinary patients. The committee presented on Monday a report, in which they stated that the Local Government Board's proposals would necessitate a reconsideration of the whole of the administrative arrangements and the probable replanning of the hospital, while single-story buildings, as compared with two-story structures, possessed the advantage of more effectual supervision and admitted of greater simplicity of planning, and consequent economy of structure. In these circumstances they recommended that the Local Government Board be informed that the managers adhered to their decision to adopt single-story cottages for the 720 ordinary patients, and to increase the unit of accommodation in each cottage from 12 to 15. This was agreed to.

Stoke-on-Trent. — The new buildings and extensions in connection with the technical schools and baths provided by Stoke Corporation were formally opened last week. The site is in Park-street, adjoining the School of Art. Part of the old baths was pulled down and reconstructed. The bath extension occupies the ground floor, and has a separate entrance. It forms the ladies' portion of the public baths, and slipper and vapour-baths, first and second-class, are provided. On the sub-ground floor of the technical school are the woodwork and pottery classrooms, each accommodating 20 students. The first floor is occupied by the physical laboratory for 20 students and the science classroom, this being arranged to seat 60 students. On this floor are also ladies' and men's cloak-rooms, lavatories, &c. On the second floor is the lecture-room for chemistry and physics, which seats 50 students; also the chemical laboratory, fitted for 20 students. Between these two is a preparation-room, with a demonstration closet. Fume closets, combustion hearths, and other fittings are supplied. On this floor are additional cloak-rooms, also store-room and balance-room. The general contractors for the work were Messrs. Bennett Brothers, of Burslem. The baths were supplied by Messrs. Twyford. The architect is Mr. J. H. Beckett, A.R.I.B.A., of Stoke. The outlay has been £3,200.

Sydenham, S.E.—For some months past the glass roof over the centre transept of the Crystal Palace, which has stood for nearly half a century, has been in process of renewal. The roof is probably the largest of its kind in the world, having a total glass area of between 14 and 15 acres. The pieces of glass originally used for the roof, when set up in Hyde Park in 1851, were 49in. long and 10in. wide. The glass weighed 16oz. to the square foot, except on the crown of the roof, where it was 21oz. Putty and paint were used for fixing the glass and keeping the roof watertight, but when the building was taken down nearly all the glass was destroyed, so that in the re-erection of the palace at Sydenham new glass had to be put in. This remained until the present year, but a large number of panes had been broken, mainly in consequence of expansion, for which sufficient space had not been allowed. The original design has been generally followed, but a departure has been made in details. The centre transept, which has a glass area of about two acres, is now nearing completion. The new pieces used measure 51in. by 18in., instead of 49in. by 10in., and the weight is 26oz. to the square foot., with 32oz. glass on the crown, instead of 16oz. and 21oz. In fixing the new glass neither putty nor paint has been used, and none will be required in maintaining it. The glass rests upon inverted T iron framework covered with lead, which has a mixture of tin, and it is fixed with a double webbing of the same —a process which resists the effects of all kinds of weather, allows for expansion, and admits of easy repair where necessary. The work has been carried out under contract by Messrs. Mellows and Co., of London and Sheffield. The remainder of the building will now be dealt with, at an estimated cost of over £20,000.

Wellington College.—A special service was held at the chapel of Wellington College on Sunday for the dedication of the north aisle which has been added to the chapel as a memorial to the late Archbishop of Canterbury. Dr. Benson, the first Master of Wellington College, occupied the position of "Head" from 1859 to 1873. The cost of the additions has been over £3,000. The architect was the late Sir A. W. Blomfield, A.R.A. Originally the chapel followed in design La Sainte Chapelle, but without the crypt—that is, it consisted simply of nave and apse. But fifteen years ago an aisle was added on the north side; and the building of the Benson aisle on the south side, therefore, completes the symmetry of the structure. Like all the buildings of Wellington College, the chapel is of red brick, the arches of the nave and the windows being in white stone. The new aisle, like the old, is lighted on the south by four stained-glass windows, each of two lancets, the designs illustrating in series the working of the Divine Spirit from Genesis to the later days of the Church. These windows are those which originally lighted the south wall of the chapel. At the east side the new aisle is lighted by a wheel window, and on the west by a window of four lancets. On the exterior of the west wall a tablet has been inlet, bearing in relief the archiepiscopal arms, supported by two kneeling figures, and in dependence, the arms of Trinity College, Cambridge, Wellington, Lincoln, and Truro. At the south-east corner of the aisle space has been left by the architect for a recumbent figure of the late Archbishop, but before this can be erected more funds must be subscribed.

CHIPS.

On Wednesday week the vicar of St. Barnabas, New Brompton, Kent, cut the first sod preparatory to the addition of a chancel and organ-chamber to that part of the church already erected. The work is to be carried out by Mr. W. C. Snow, whose tender of £2,102 was the lowest sent in.

The Leeds City Council have resolved to make application to the Local Government Board for power to borrow £300,000 for hospital purposes, including £21,250 for the Killingbeck estate.

A Peters Memorial Church is about to be erected at Stirling for the congregation of the Free North Church. The building is Late 15th Century in style, and will consist of aisled nave of four bays, shallow transepts, and chancel of four bays, and a western tower finished with an open crown spire. The architect is Mr. J. J. Stevenson, F.S.A., of London, whose design was hung at the Royal Academy this summer.

The vestry of Bermondsey are desirous to erect dwellings for their employés, and have applied to the London County Council for a loan to acquire sites and build houses thereon, but have received a reply from the Council stating that the vestry have no power to borrow for the purposes named, but that possibly "the object of the vestry might be attained by the Council for the new borough under the London Government Act, 1899, adopting part III. of the Housing Act, and erecting houses thereunder for the working classes." The special committee of the vestry directed that a further letter be addressed to the Council on the subject.

The site chosen for the new police-station and public library for West Hunslet, Leeds, is at the corner of Hunslet Hall-road and Dewsbury-road. The ground, with the buildings upon it, belongs to the Middleton Estate and Colliery Company, and the city council has approved the purchase at £3,000.

The stained-glass windows for Rochester Cathedral which have been subscribed for by the masons of Kent were recently placed in position in the south-west transept. The figures represented are Solomon, Aholiab, Bezaleel, Ethelbert, Gundulph, and Walter de Merton. There are also shields in the windows containing the arms of the See of Canterbury, the See of Rochester, the Bishop of Rochester, the Dean of Rochester, and Merton College, Oxford. The windows were designed by Mr. C. E. Kempe.

PROFESSIONAL AND TRADE SOCIETIES.

Architectural Association: Discussion Section.—The second meeting of the Discussion Section was held on the 3rd inst. at 56, Great Marlborough-street, W., Mr. W. B. Hopkins in the chair. A paper by Mr. George H. Smith was read on "Monumental Brasses." Commencing with calling attention to the interest the subject gives rise to, to the architect or antiquary, and in the study of heraldry and ecclesiastical vestments, Mr. Smith stated that the "brasses" were made of an alloy called "laten," chiefly made in Cologne, and imported in plates to be engraved by the various guilds in London. The earliest brass is at Verden, 1231, to the memory of a German bishop. The earliest in this country is that of Sir John Daubernon, 1277, in Stoke d'Abernon Church, Surrey. The rise of this method of memorial work through the reign of the Edwards till its decline under the Henries was traced. The method of taking a "rubbing" was carefully described, and Mr. Smith stated it was surprising that in England as many as 3,000 to 4,000 brasses still remained, notwithstanding the stormy days of the Reformation and the Great Rebellion. An interesting discussion followed, opened by Mr. H. Rose. Mr. Fellowes Prynne and Mr. E. Swinfen Harris spoke in conclusion as special visitors, and the meeting then terminated.

Architectural Association of Ireland.—Last night a meeting of this Association was held in the Grosvenor Hotel, Westland-road, Dublin, Mr. George P. Sheridan, president, in the chair. The following gentlemen were elected members: Messrs J. T. Rea, J. Norman Masterson, W. H. Ward, and P. L. Dickenson. Mr. T. E. Hudman delivered a lecture on "Architectural Practice 200 Years Ago," in the course of which he dwelt on the fact that the literature of the time bearing on the subject was not very plentiful, at least in the libraries of Dublin. Catalogues of the National Library were not sufficiently indexed to enable a reader to readily find such books as contained the material he wanted. He mentioned that Vitruvius, who practised in Rome during the reigns of Augustus and Julius Cæsar, where there were 700 other architects in practice, was the greatest of architectural writers. The dull apathy towards all things artistic which followed the austerities of the Cromwellian period, was followed by a re-awakening on Classic lines, based on Vitruvius and Palladio. Up to the beginning of the 18th century architects were more of the type of the artists, and were frequently painters, sculptors, and silversmiths, and only supplied the sketches, and in large works superintended the making of a model to scale. The details were intrusted to a master builder, whose office was on the lines of the present-day clerk of works, and it was to this fact that so many buildings showed such weakness in detail, while the general design showed evidence of skill and thought. Architects did sometimes superintend their buildings; but in those cases they were called surveyors, and generally held appointments as such to some public body. At the commencement of the 18th century architects and surveyors separated and formed dual professions, and building work gradually worked it way into the system now in vogue. This was partly due to the enormous increase of building in London, consequent on the great fire of 1666, and also to the fact that in the time of Charles II. a series of legislative enactments came into force, which compelled buildings to be erected with some conformity to laws regulating stability and quality of materials, and called into being a staff of officials whose business it was to see their laws carried out. Those Acts had been repeatedly repealed and amended, but they remained for all that the by-laws regulating buildings now in force in the kingdom. The lecturer concluded by showing lantern-slides, illustrating work of the period in Ireland. A vote of thanks was proposed to the lecturer by Mr. R. M. Butler, seconded by Mr. J. H. Webb, and carried unanimously.

Architectural Studies in Yorkshire.—This was the title of an illustrated lecture delivered on Monday evening to the members of the Leeds Thoresby Society by Mr. G. Bertram Bulmer, F.R.I.B.A. The gathering, which was held in the society's rooms, in Park-street, Leeds, was presided over by Mr. Edmund Wilson. Mr. Bulmer's discourse dealt with examples of domestic and ecclesiastical architecture in Yorkshire, and the illustrations shown on the screen were taken from the lecturer's own drawings, having been carefully prepared from measurements taken on the spot. The examples dealt with comprised specimens of the various periods from the Norman Conquest downwards, and including some Late Renaissance work. In church work the illustrations included pulpits, a font cover, churchyard crucifixes, bench-ends, singing lofts, and other details. Interesting features of domestic architecture dealt with were the curious old gateway at Knostrop Hall, a sculptured fireplace from an old inn at Knottingley, and the doorway of King James's Palace. These and other details were selected out of a mass of material to be found in various parts of the county. The lecturer pointed out that there was here a mine of knowledge that had not been sufficiently worked, and his object was to place on record specimens which he considered particularly valuable, in the belief that they would possess interest both for the architect and the antiquary. He was emboldened to do so again, because of the marked advance in public taste in the matter of architecture.

Birmingham Architectural Association.—The 25th annual report of this body states that the activity mentioned in last year's report has been maintained, and the session has been an interesting and useful one; but the council are still sorry to feel the lack of support from senior members, whose attendance is very scanty, and they feel that it is impossible for their efforts in such work, for instance, as the revision and administration of the city building by-laws to carry the weight and exert the influence they should unless supported by the experience of the older members. To the classes established by the association a new three-year course of study was added last year, to take up the consideration of "Architectural History." The president, Mr. W. H. Bidlake, M.A., is the lecturer, and the Classic styles have been dealt with during the season. The roll contains the names of twelve honorary members, 60 ordinary members, and 52 associates.

Sanitary Inspectors' Association.—A meeting of the members of this association was held at Carpenters' Hall, London-wall, on Saturday evening. Mr. W. H. Grigg, the newly-elected chairman of the council, delivered his inaugural address, in the course of which he reviewed the work of the coming year. He mentioned that the Qualification and Tenure of Office Bill would be supported by members of every shade of political opinion, and it had the enthusiastic approval of nearly every Sanitary Inspectors' Association in the kingdom. Under the present condition of things, sanitary inspectors—who were appointed for limited periods—were liable to dismissal without compensation at the capricious will of the local authorities they served, and the Bill laid down the principle that no such step should be taken without the consent of the Local Government Board. Another matter for consideration was the urgent necessity of promoting the amalgamation of the Sanitary Inspectors' Associations throughout the country in order to present a united front to their enemies.

Scottish Building Trades Federation.—The fifth annual meeting of this federation was held on the 2nd inst. at the Windsor Hotel, Glasgow, Mr. James Leslie, builder, Aberdeen, president, in the chair. The representatives of the federation, together with a number of specially invited guests, including a deputation from the National Association of Master Builders of Great Britain, took lunch at one o'clock in the large hall of the hotel on the invitation of the associations in Glasgow affiliated with the federation. At two o'clock the federation proceeded to business, the president in the chair. Representatives were present from Aberdeen, Airdrie and Coatbridge, Arbroath, Ayr, Bute, Clydesdale, Dundee, Edinburgh, Glasgow plasterers, Glasgow wrights, Inverness, Kilmarnock, Kirkcaldy, Oban, Paisley, Perth, Peterhead, St. Andrews, also the English deputation. The secretary (Mr. James L. Selkirk, C.A.) read the report of the executive, which narrated at length their operations during the past year, and the steps taken to extend and strengthen the organisation throughout the country. A strong feeling was also expressed by a number of members in favour of appointing an organising agent. This, along with other matters, was remitted to the executive for further consideration. Office-bearers were elected for the ensuing year—viz., Mr. Thomas Kay, wright, Glasgow, president; Messrs. Alex. Beveridge, builder, Perth, and Robert Lamb, builder, Edinburgh, vice-presidents; with James L. Selkirk, C.A., Glasgow, secretary and treasurer. A public meeting of those connected with the various branches of the building trades in Glasgow was held in the evening in the Building Trades Exchange, 30, Gordon-street, Mr. Thomas Kay, president, in the chair, at which addresses were delivered by the deputation from England and other gentlemen. The object of the meeting was to hear the objects and advantages of federation explained by leading members and by a deputation from the National Association of Master Builders.

CHIPS.

The parish church of Hengoed was reopened last week after restoration and reseating, works carried out by Messrs. Jones and Evans, of Willow-street, Oswestry.

The nave of the parish church of St. Mary, West Malling, Kent, re-erected in 1780, is about to be rebuilt on broader lines from plans by Mr. J. T. Micklethwaite, F.S.A. The new nave will have north and south aisles, and will be of stone with battlemented parapets and red-tiled roofs. The seating will be oak. The style to be adopted is Late Decorated, and the outlay is estimated at £4,000, most of which has been raised.

At the Birkenhead Police-court, on the 1st inst., Robert Blackburn, builder, Sidney-road, Higher Tranmere, was fined penalties amounting in the aggregate to £15 15s. 6d. for occupying a dwelling-house built by himself in Sydney-terrace without having obtained a certificate of habitability from the borough surveyor, and for various other offences under the building by-laws, including that of omission to submit plans before beginning to build.

A new Roman Catholic church is being erected in Bridgewater-street, Little Hulton, Walkden. The building, which replaces an edifice destroyed by fire in March, 1898, is to cost nearly £3,000.

On Nov. 1 a Local Government Board Inquiry was held at the board schools, Wivenhoe, by Mr. G. W. Willcocks, M.I.C.E., and H. T. Bulstrode, M.D., in reference to an application of the district council for sanction to a loan of £6,050 for works of sewerage and sewage disposal. The scheme was explained to the inspectors by Mr. H. H. Sands, C.E., of the firm of Sands and Walker, C.E., Nottingham.

The foundation-stone of a Chapter House for St. Ninian's Cathedral, Perth, erected as a memorial of the Right Rev. Charles Wordsworth, D.D., D.C.L., late Lord Bishop of the Diocese of St. Andrews, Dunkeld, and Dunblane was laid on the 2nd inst. by Lord Rollo.

Sewage farm buildings are determined upon by the Bolton Corporation for the sewage filtration works and the engineers. Messrs. Hinnell and Murphy, C.E., of Manchester and Bolton, have prepared the necessary plans for obtaining the powers required.

On Friday Messrs. Aldrich Bros., Limited, brush, mat, and matting manufacturers, of Diss, entertained their workpeople to tea, to celebrate the opening of a warehouse which has just been erected in connection with their Roydon factory. From plans prepared by Mr. J. S. Corder, Ipswich, a building 80ft. long and 40ft. wide, with three floors, has been erected, Mr. E. West, of Chelmsford, being the contractor. A new 30H.P. engine has been erected, and power-looms are to be added, and other buildings are in course of construction.

The Local Government Board has sanctioned the application of the Oakwell Joint Hospital Board for power to borrow £13,000 for the erection of an infectious diseases hospital on the Foxhill estate, situate between Birstall and Gildersome. The plans have been prepared by Mr. Burrows, of Birstall.

The Gas Committee of the Nelson Corporation have unanimously appointed as gas-engineer for the borough Mr. Alexander Allen, manager of the Neepsfield Gasworks, Sheffield. There were 49 applicants for the post, to which a salary of £400 per annum is attached.

At the Chester Consistory Court, on Friday, the vicar and churchwardens of the parish church of Runcorn were granted permission to make several improvements in the church, and to place a stained-glass window in the church of St. John the Evangelist, Weston.

The tender of Mr. Wise, of Deal, amounting to £12,950, has been accepted for the erection of the first portion of the new asylum buildings, about to be erected at Canterbury. The work under this contract will provide accommodation for 50 patients. The preparation of quantities for the larger contract for the completion of the asylum is to be forthwith proceeded with.

A new shooting lodge is being erected by Mr. Rudd of Ardnamurchan, on the bank of the river Shiel, on the site of the old Shielbridge Hotel. Mr. Rudd has obtained the permission of the County Councils of Argyle and Inverness to make a divergence of the road in the vicinity of the lodge, and to construct a new bridge a short distance further up the river. At the point where the bridge is to be built, the river is 120 yards in width. The structure, which will cost £3,000, is to be built entirely of stone, and will be of three arches.

The first of a series of six lectures on sanitation and hygiene for the clergy was delivered on Monday night at the Chapter House, St. Paul's Cathedral. The Bishop of Stepney, who presided, pointed out how important it was to the clergy to keep in health, and also to be able to instruct their poorer parishoners in matters of sanitation. The lectures are under the auspices of the National Health Society. Dr. A. T. Schofield, in his lecture, dealt at length with the causes of disease, effects of environment, occupation in life, and of bad air and bad food.

Mr. H. H. Law, Local Government Board inspector, held an inquiry at King's Heath on Friday, into the application of the King's Norton Urban District Council for power to borrow £3,751 for street improvement works, and £120 for sewerage purposes. Mr. A. W. Cross, surveyor to the urban council, explained the proposals.

Mr. Francis Carr, of Heslington, York, died on Saturday, in his eighty-eighth year. He was by profession a land agent and surveyor, and was for many years business agent of estates in Yorkshire and Lincolnshire. He was a prominent breeder of shorthorns, and through this fact and his professional connections was well known over the North of England. He was elected to the office of sheriff of York in 1863, and promoted a variety of objects for the benefit of the agricultural community.

Foundation-stones of a Congregational Chapel were laid in Buxton-road, Stockport, last week. The building, which will cost £3,000, will be Late Decorated in style, built of Yorkshire parpoints with red sandstone dressings, and fitted up in pitch-pine. Accommodation will be provided for 400 persons. The architects are Messrs. Sankey, Cubbon, and Cubbon, of Manchester.

Upon a site at the rear of Messrs. D. Evans and Co.'s premises in Queen-street, Cardiff, Mr. Solomon Andrews has just built a hall capable of accommodating over 3,000 persons, seating accommodation being provided for 2,500. The floor is 143ft. in length and 73ft. wide. The balcony is fitted up with upholstered "tipping" seats. Behind the platform provision has been made for large choirs, and a space has been allotted for an organ which will shortly be fitted up at a cost of £1,500. The opening took place on Thursday in last week.

On Wednesday week Mr. H. H. Law, M.I.C.E., an inspector from the Local Government Board, attended at the National School, Aldridge, Staffs, to inquire into an application made by the Walsall, Rural District Council to borrow an additional £2,500 from the Local Government Board in connection with their sewage works. The engineer, Mr. J. E. Willcox, gave evidence that the number of houses drained by the scheme would be 350, and the population affected 2,000.

At Birmingham, on Friday, a Local Government Board inquiry was held, before Mr. Herbert Law, with reference to an application to borrow £30,000 for the provision of public baths in Green-lanes, Small Heath. Mr. H. Martin, the architect, explained the plans to the inspector, and Mr. J. Cox gave some explanations regarding the engineering work. It was stated that the building contract had been let for £21,000 to Messrs. Whitehead and Sons. There was no opposition to the application. Subsequently the inspector dealt with applications by the council to borrow £8,400 for the purposes of five street improvements and £5,200 for the construction of underground sanitary conveniences at Ratcliff-place and Stephenson-place.

The Light Railway Commissioners held an inquiry at Faversham, on Friday, respecting an application made for an order for the construction of a light railway from Faversham to Maidstone. Counsel appeared to oppose on behalf of the neighbouring town of Sittingbourne, who are desirous of getting the railway to run thence to the county town. At the outset the commissioners ruled that the opposition had no *locus standi*, and after hearing evidence they said that they would recommend that the order be granted. The line will be 12 miles long, and will cost £87,000.

The town council of Aberdeen have adopted the tramway committee's scheme for an extension of the system to Torry, by way of Market-street; Ferryhill, by way of Crown-street; and the bathing station, by way of Justice-street and Constitution-street. Like that to Woodside, these new routes are to be double lines, electrically equipped. Parliamentary powers will be sought next session for the works, which are estimated to cost £124,902.

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ILLUSTRATIONS.

NEW TOWN HALL, GODALMING.—TWO HISTORIC CHURCH STEEPLES. — WELSH CALVINISTIC METHODIST CHAPEL, CARDIFF.—NEW SCOTLAND YARD POLICE STATION.—A ROOM IN THE LOGGIA, CASTLE KREUZENSTEIN.—ST. MICHAEL AND ALL ANGELS CHURCH, BECKENHAM.—MIDLOTHIAN COUNTY BUILDINGS, EDINBURGH.

Our Illustrations.

NEW TOWN HALL, GODALMING.

We shall give a description of this building, with remaining illustrations, shortly. At present, it is not to hand.

TWO HISTORIC CHURCH STEEPLES.

All Saints Church, Derby, was added to an earlier church (presumably Decorated), and was completed about the year 1530. It is a very fine specimen of the Somersetshire type—the only example that I know of in the more Northern counties. The height is 174ft. to top of parapet. This is said to be the highest parish church tower in England, with the exception of Boston "Stump," which is more than half as high again. The detail is remarkably good, and quite free from the coarseness which one would expect in work of so late a date. The original nave and chancel were demolished in 1723, and the present Classical nave was erected from the designs of Gibbs. It is one of Gibbs's best works, but is altogether out of harmony with its Gothic adjunct. Inside the church are several interesting tombs, the best being that of the famous Elizabeth Shrewsbury, Countess of Hardwicke, who built houses at Hardwick, Chatsworth, and Oldcotes. She died in 1607. There is also some good ironwork by Bakewell, in screens to the sanctuary. *St. Michael's Church, Coventry.*—This tower and spire are deservedly well known. St. Michael's Church is a beautiful piece of work, almost completely Perpendicular. The interior is remarkable, as having no chancel arch, the same roof being continued over the nave and choir. There are some good oak seat-ends in the church. The tower has been very largely restored by Mr. John O. Scott, F.S.A., within recent years.

J. A. Woore.

WELSH CALVINISTIC METHODIST CHAPEL, CARDIFF.

This chapel is now being erected in Crwys-road, Cardiff. The materials used in the building are Pennant stone for the walls generally and Doulting stone for dressed work. Internally, the seats, &c., are of pitch-pine. Advantage has been taken of the level of the site being below the street, and a schoolroom, with classrooms, kitchen, and minister's vestry, are thus provided. The chapel floor, together with a gallery, will accommodate about 600 worshippers. With regard to the design, the architect has not attempted any distinct style, but has endeavoured only to devise a building striking and picturesque in appearance, and yet indicative of its purpose. The builder is Mr. Harry Gibbon, of Cardiff. The amount of contract is £2,660, and the architect is Mr. John H. Phillips, St. John's Chambers, Cardiff.

NEW POLICE STATION, NEW SCOTLAND YARD, S.W.

This important building, which is to be erected on a portion of the conspicuous site formerly occupied by the Civil Service Commission on the Thames Embankment, will replace King-street Station, demolished in the clearance necessitated by the new Government Buildings. The site is at the corner of Cannon-row. It provides large administrative offices and stables, with quarters for both single and married men. It will group well with Mr. Norman Shaw's famous building of New Scotland Yard. It is settled to erect the building with granite, red bricks, Portland stone, and green Westmoreland slates. The drawing is by Mr. Charles A. Battie, and was exhibited at the Royal Academy this year. The work will be carried out by the architect and surveyor to the Metropolitan Police, Mr. J. Dixon Butler, and the building will harmonise with the larger block already referred to, and to which this will form a fitting and important auxiliary.

CASTLE KREUZENSTEIN.

This sketch shows a room in the loggia of this historic building which has been well preserved and renovated, old furniture being placed in the rooms in character with the fabric. The ceiling of the apartment illustrated to-day is highly elaborated in coloured decoration, and the frieze is wrought in plasterwork of Sarasenic foliations, with coloured figure work oddly spaced over the dado capping. Some paintings occur over the chimneypiece, which is Gothic in character. The floor is ornamented in diaper work. The view was photographed by Mr. Wilhelm Burger, of Vienna, for the "Wiener Bauten-Albúm."

ST. MICHAEL AND ALL ANGELS, BECKENHAM.

The first stone of this church was laid on Oct. 2 by the Bishop of Dover. It is situated in the outlying district of the Birkbeck estate. When completed the church will accommodate 734 persons. The walls are to be externally and internally of stock bricks, relieved by red brick, except above the string-course, which is to be plastered. The roofs are open trusses, to be covered with slates. The present contract is for the chancel, chapel, organ-chamber, and vestries only. The architect is Mr. Arnold H. Hoole, and the contractor is Mr. F. W. Green, of Beckenham-road.

MIDLOTHIAN COUNTY BUILDINGS, EDINBURGH: SELECTED DESIGN.

(For description see p. 612.)

◆

During a thunderstorm which broke over Eskdale and Liddesdale on Wednesday last, the spire of the parish church at Rockliffe, a prominent object in the district, standing 170ft. high, was almost destroyed, being completely demolished down to the belfry. The church also was greatly damaged.

At Tuesday's meeting of the London County Council, the recommendations of the Water Committee for the introduction in Parliament next session of Bills for the purchase of the undertakings of the London water companies, and the provision of a supplementary supply from Wales were adopted after a long discussion by considerable majorities.

The business at the Mart, Tokenhouse-yard, during last week was attended with great success. Not only were withdrawals fewer than usual, but remarkably good prices were secured on sales. The operations were signalised by the appearance of large parcels of ground-rents and an entire brewery estate in Essex, the offer of these securities yielding the most satisfactory results. A building estate in the North of London produced on competition a far greater return than was expected. The sales amounted to £185,370, being just twice as much as the sum registered in the corresponding week of last year.

A proposal is now on foot for a light railway to supply the agricultural district lying between Bury St. Edmunds in Suffolk and Attleborough in Norfolk. The line, which is to be 37 miles long, is estimated to cost £150,000, and will start from Thurston, near Bury St. Edmunds, and pass through Pakenham, Ixworth, Stanton, Hopton, Garboldisham, Kenninghall, Banham, Old and New Buckenham, to Diss and Attleborough, with branch lines from Walsham-le-Willows, Rickinghall, Redgrave, and Wortham.

The screen and rood-loft in the fine Perpendicular church of All Saints, Kenton, Devon, has just been restored by Mr. H. Reed, of Exeter, under the direction of Mr. F. Bligh Bond, of Bristol, as a memorial to the late Lord Courtenay.

COMPETITIONS.

Barmouth.—A small public library to cost £1,200 is to be built at Barmouth, including a club room, and also a room for housing the collection of books given to the town by Miss Frances Power Cobbe. Six designs were received, and the plan marked "Light and Air," by Mr. H. Teather, of Shrewsbury, has been chosen.

Leeds.—In our notice last week, p. 583, of the award of premiums for designs for the new Masonic Hall, to be built in Great George-street, Leeds, we should have stated that No. 5, which was placed second, was the joint work of Mr. Clarence S. Coggin, A.R.I.B.A. and Mr. Thomas Wallis, both of 15, York-buildings, Adelphi, W. C.

Lochgilphead, Argyllshire, N.B.—A new court-house and police building are about to be erected at Dunoon by the Argyll County Council, and a competition has been held. The design submitted by Messrs. John McKissack and Son, of Glasgow, has been placed first. The second premium is accorded to Messrs. H. and D. Barclay, of Glasgow, and the third premium is won by Mr. Alexander Gauld, C.E., of Falkirk. The buildings are intended to take the place of those at present at Inverary, and the cost is stated to be £8,500. The police building section is chiefly an old part of existing premises renovated and adapted.

Plumstead.—We understand that on Wednesday last the vestry confirmed the award of the referee, Mr. Mountford, in the competition for the Municipal Buildings and Public Library, Plumstead, as follows:—1st premium, Mr. A. Brumwell Thomas, 7, Queen Anne's Gate, Westminster; 2nd premium, Messrs. Hall, Cooper, and Davis, of Old Queen-street, S.W., and Scarborough; and 3rd premium, Messrs. Potter and Cranfield, A.R.I.B.A., Lincoln's Inn-fields, W.C. A notice of the designs appeared in the Building News for the 27th ult. and on the 3rd inst.

CHIPS.

The inaugural meeting of the session of the Institute of Junior Engineers was held at the Westminster Palace Hotel on Friday night. Sir William H. White, the retiring president, introduced the Hon. Charles A. Parsons, the new president, and decorated him with a badge of office.

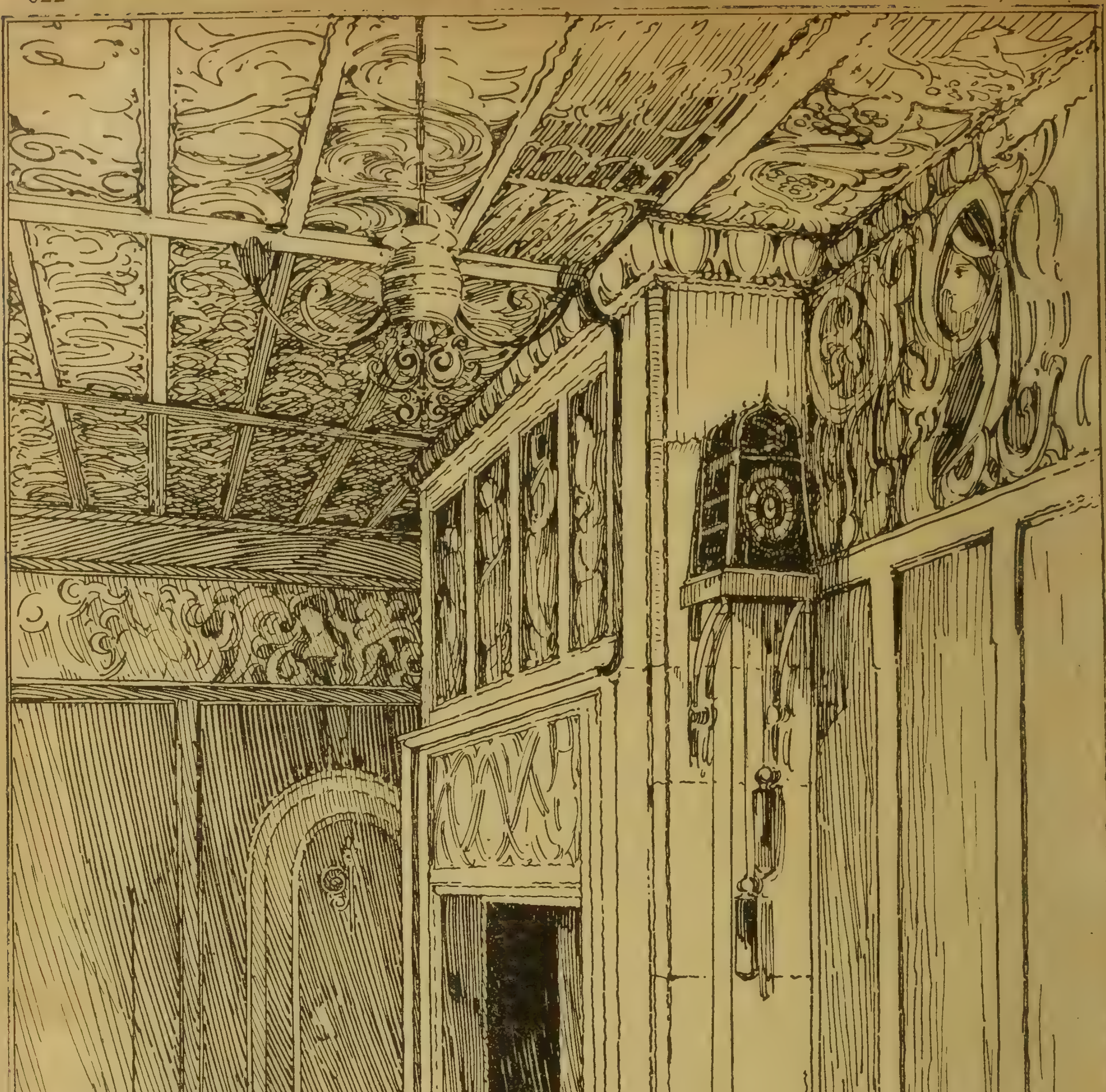
A largely-attended meeting of employers in the building trades was held on Thursday evening in last week, in the Building Trades Exchange, Glasgow, with the object of extending the membership and organisation of the Scottish Building Trades' Federation.

Mr. Henry Huckett, who had carried on the business of builder and contractor at 240, New North-road, Islington, for nearly 40 years, died on Tuesday week at the age of 64. The deceased only survived his wife a few months, and leaves a family of seven daughters. Mr. Huckett had for many years been senior trustee to a large Foresters' court in Ball's Pond-road.

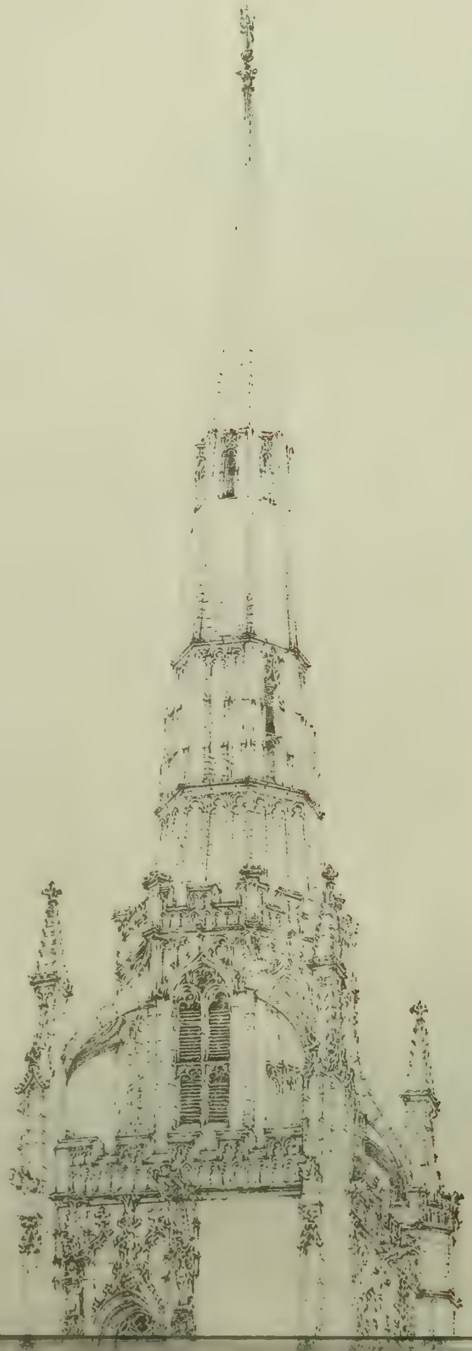
Sir John Brunner opened on Saturday afternoon the Guildhall at Winsford, Cheshire, erected by him at a cost of £3,000, for trades-union societies and other organisations. Mr. E. A. Powles, of Northwich, was the architect of the Guildhall, which is Jacobean in style, and is built of red bricks with terracotta dressings.

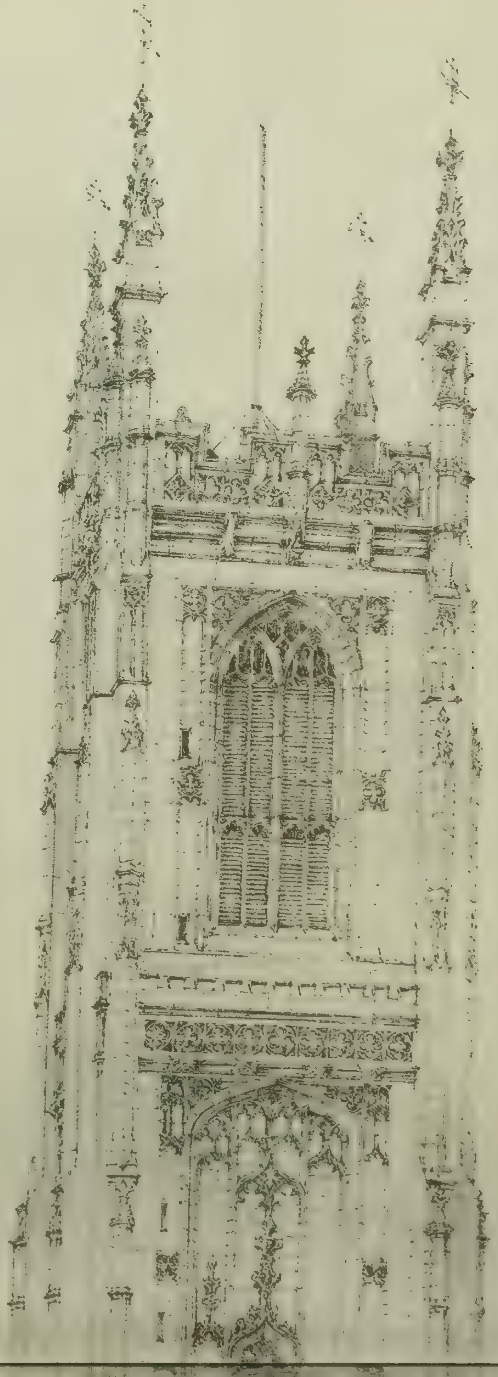
In consequence of the continued increase in the size of ships, the London and India Docks Joint Committee have decided to lengthen and deepen the entrance to the South West India Dock. The present lock is 300ft. long and 27ft. deep in the centre, but the invert being curved only a depth of 23ft. 6in. is available for the full width. It has now been decided to lengthen the lock to 480ft., with three pairs of gates, and to deepen it to 29ft. As the dock itself is 29ft. deep, the alterations will enable large vessels to avail themselves of eleven deep-water berths.

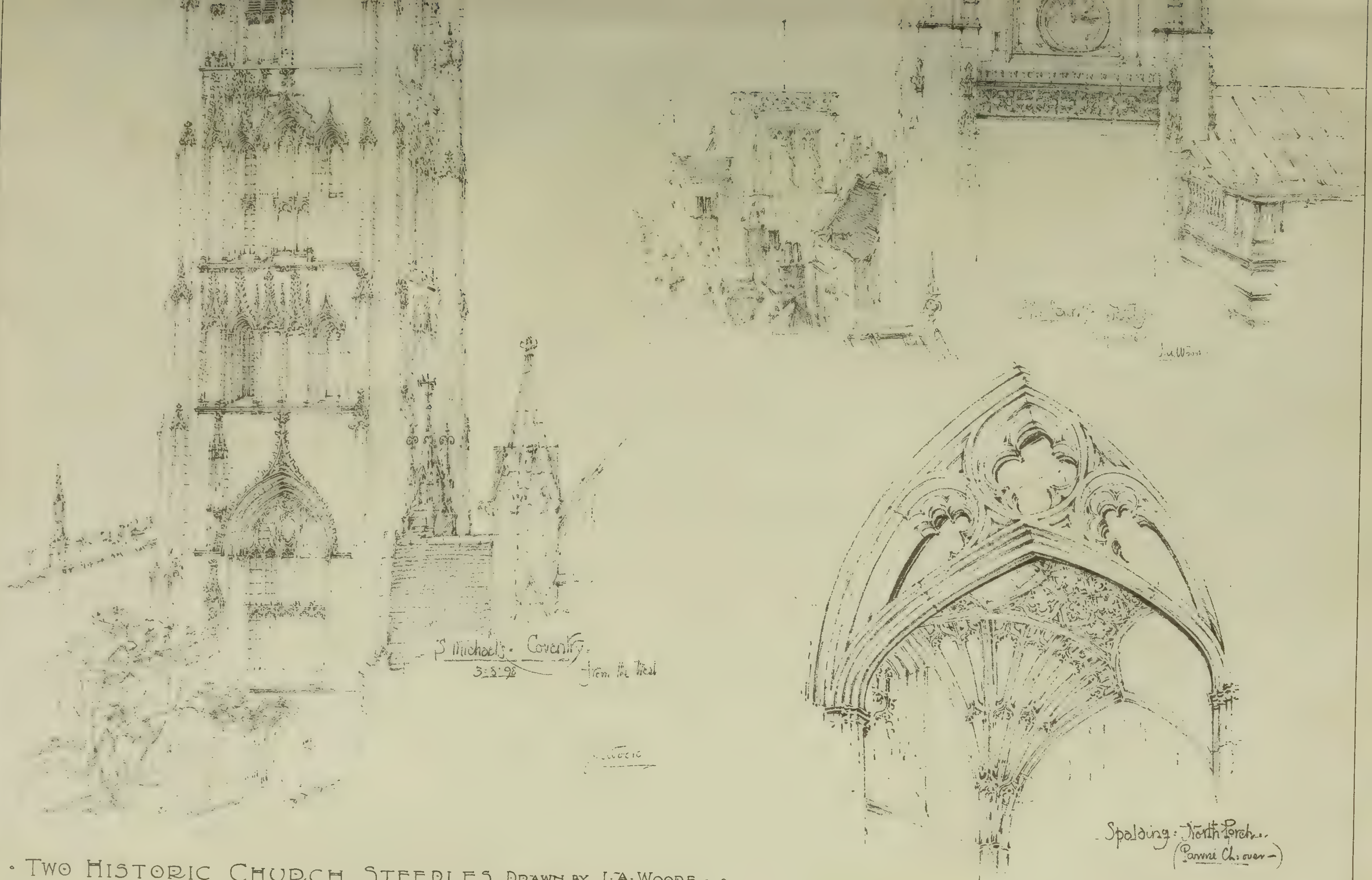
The work of laying down the new roads and railways on the north bank of the Tees is actively under way. The double line of railway from Haverton Hill to Billingham Beck is nearing the latter place, and the work of the new road is also well in hand. Five acres of land have been sold to Messrs. Handyside and Co., of Derby, for the erection of bridge works. The land for Messrs. Bell Brothers' new works for the manufacture of steel-plates from Cleveland ore under the Saniter process, and which are to cost £300,000, is also being laid out. The roads and railways are expected to be completed in July next.



ROOM IN CASTLE KREUZENSTEIN.







· TWO HISTORIC CHURCH STEEPLES DRAWN BY J·A·WOORE · ·

"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

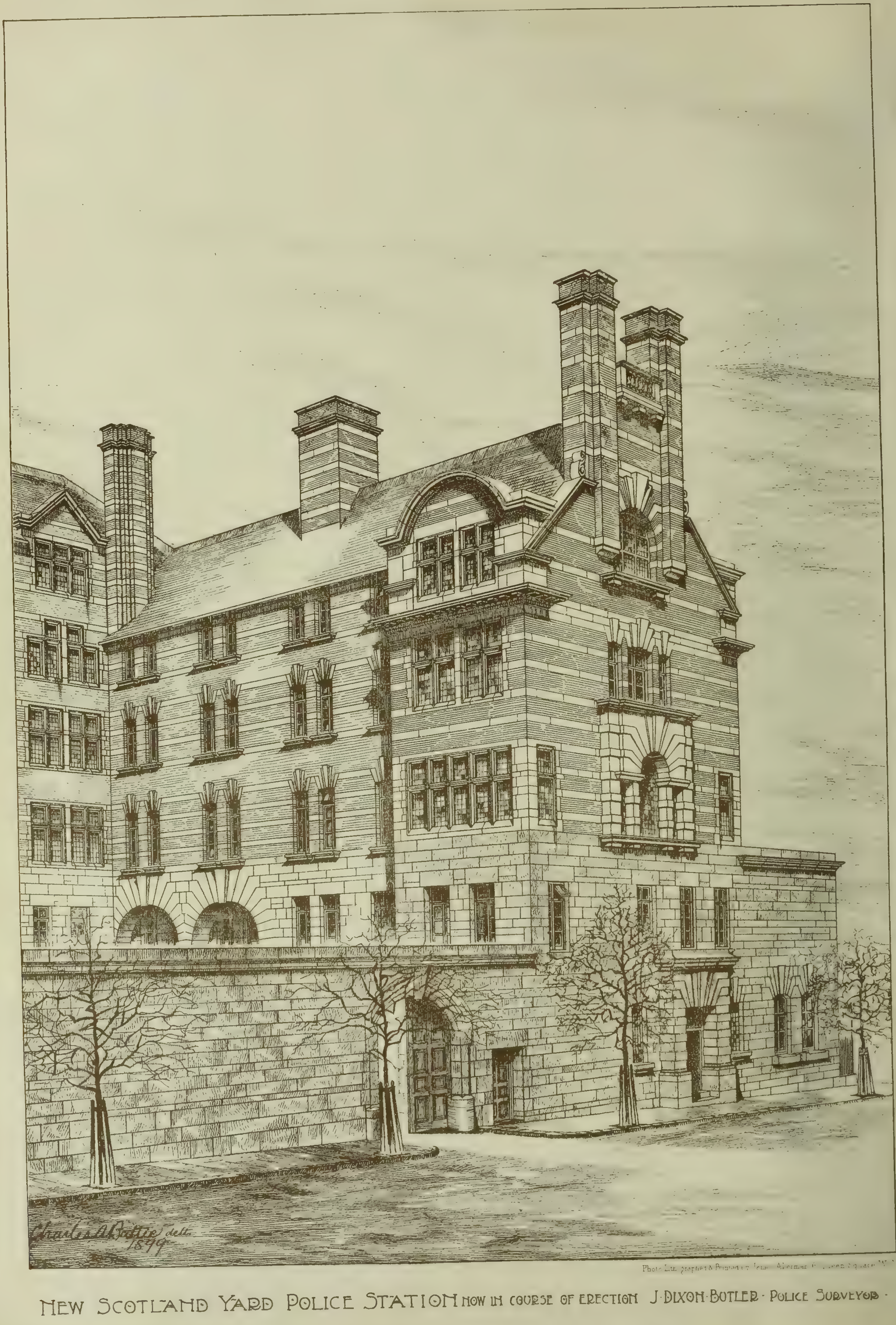
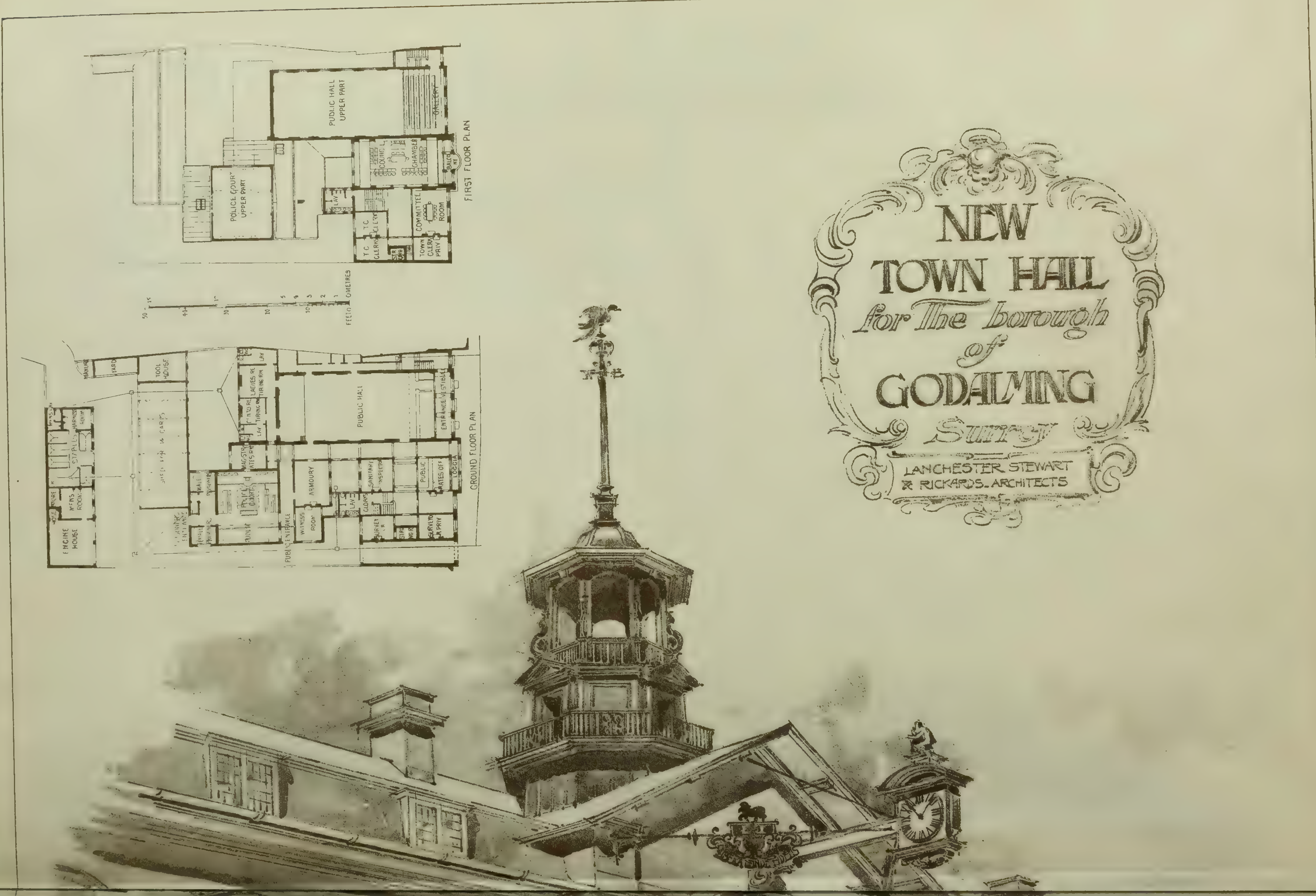


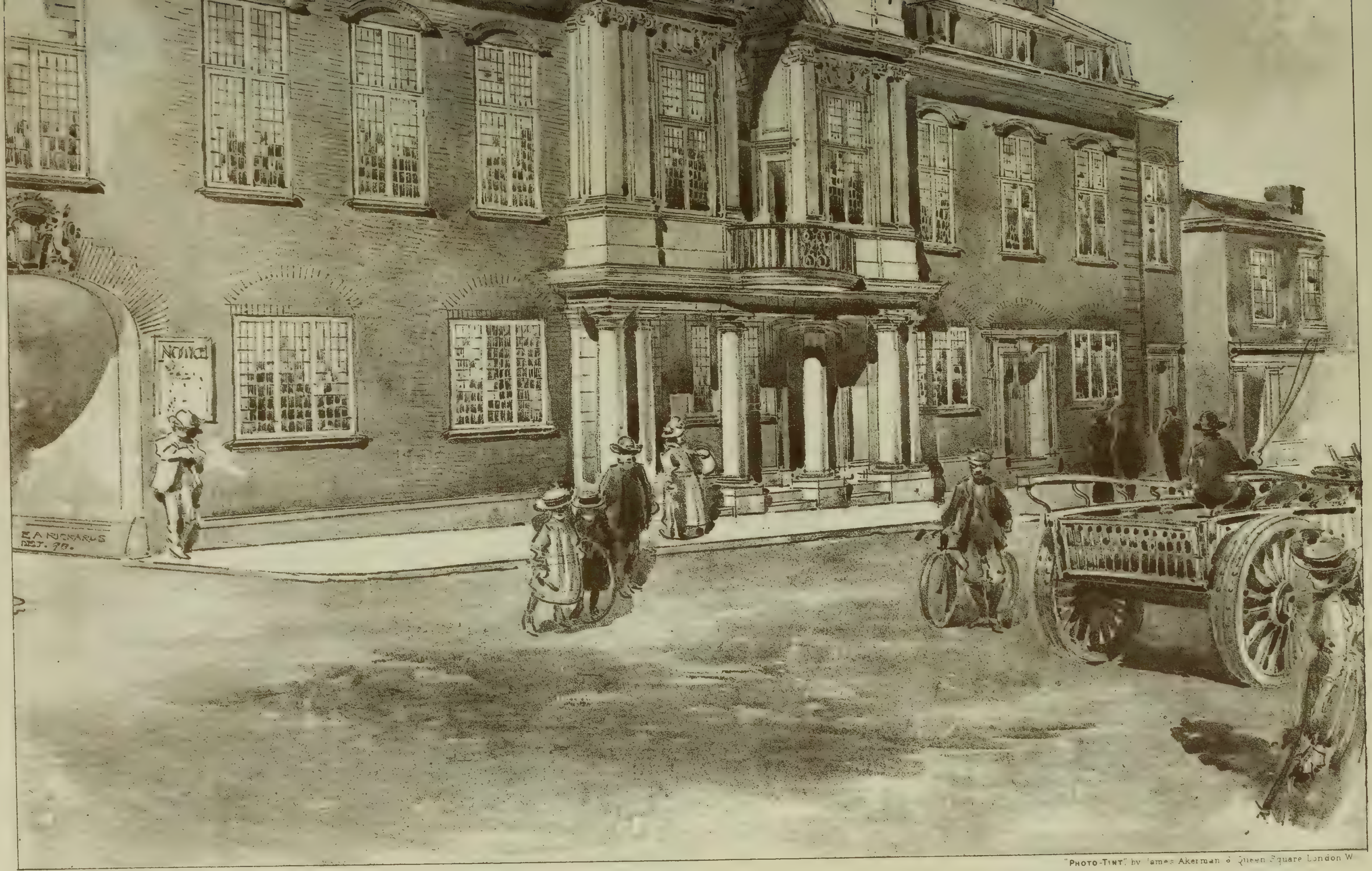
Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

NEW SCOTLAND YARD POLICE STATION NOW IN COURSE OF ERECTION J. DIXON BUTLER · POLICE SURVEYOR ·



NEW
TOWN HALL
for The borough
of
GODALMING
Surrey

LANCHESTER STEWART
& RICKARDS. ARCHITECTS



"PHOTO-TINT," by James Akerman 6 Queen Square London W.

WELSH·CALVINISTIC·METHODIST·CHAPEL·CARDIFF

J·H·PHILLIPS·ARCHITECT
St. John's·Chambers·Cardiff.

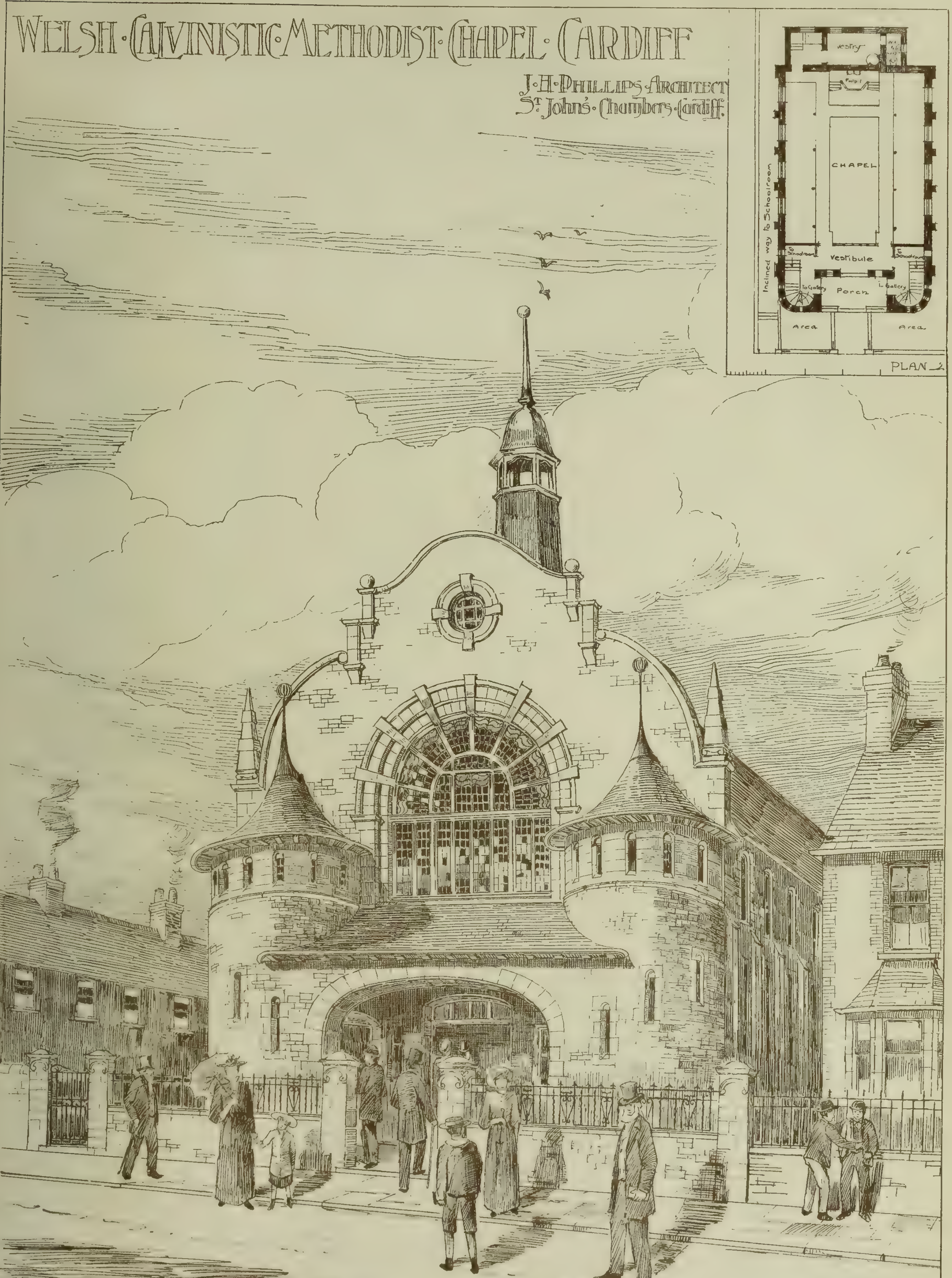
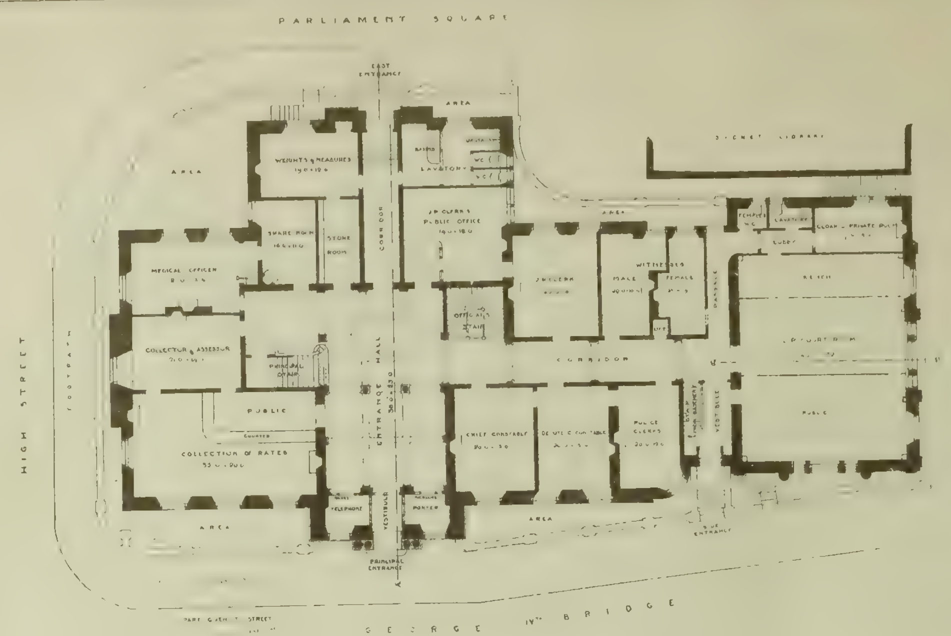


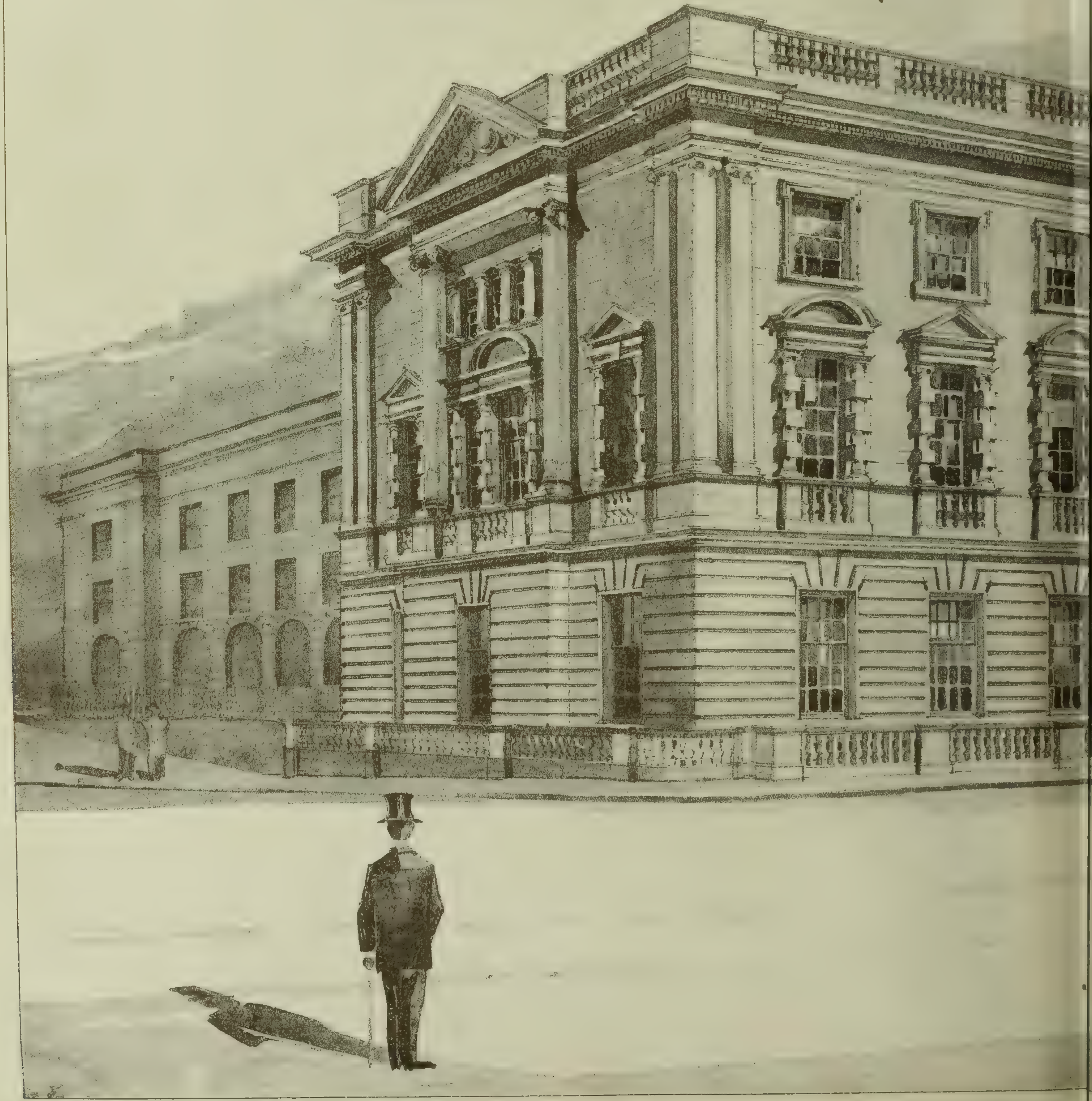
Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

MIDLOTHIAN COUNTY COU

SELECTED DESIGN . M

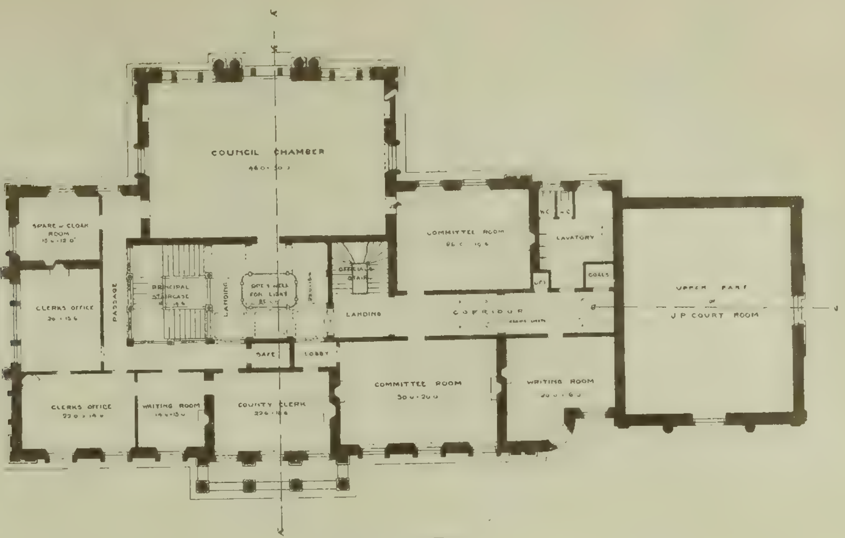


Plan of Street Floor

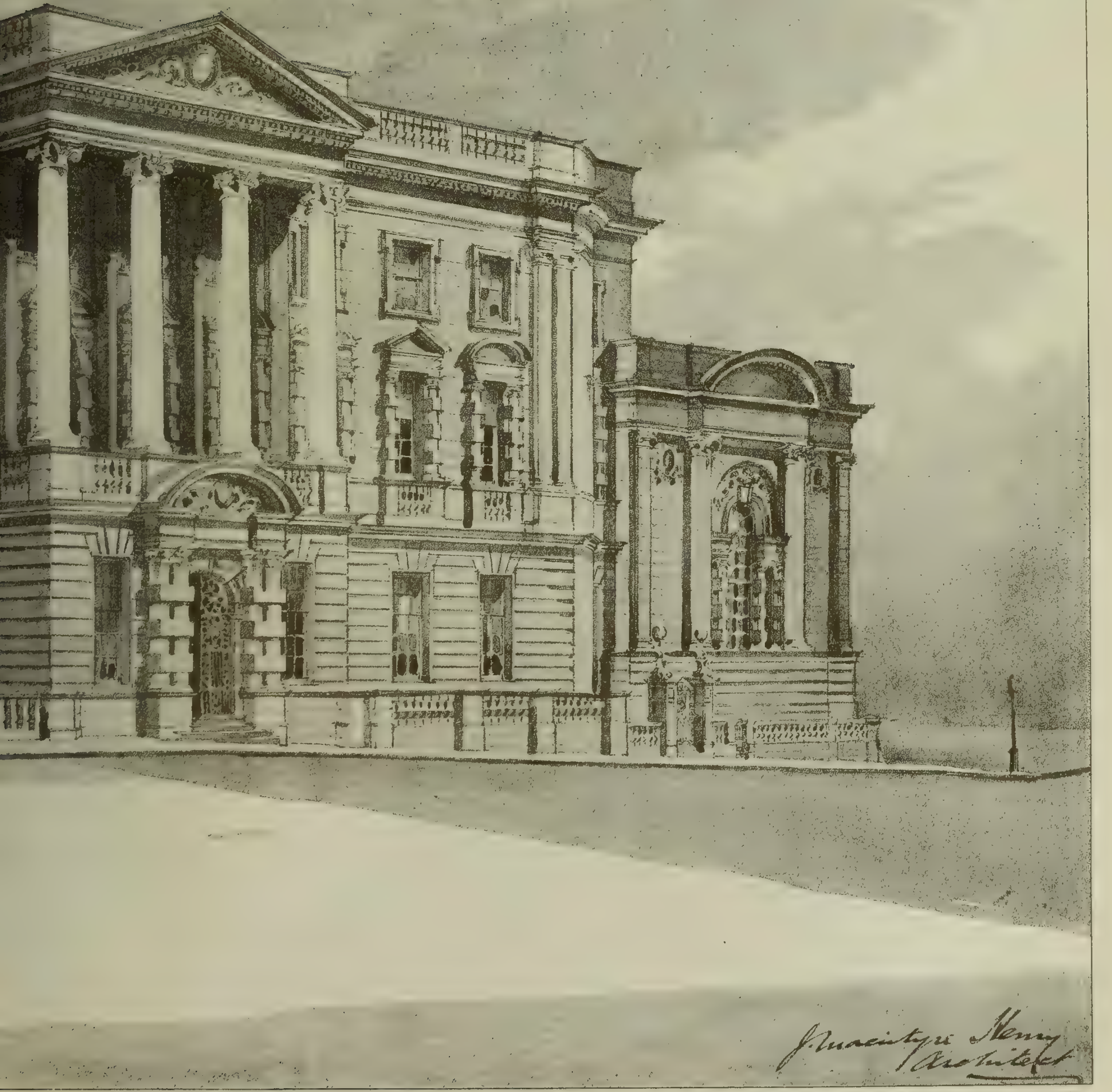


BUILDINGS, EDINBURGH.

TYRE HENRY ARCHITECT

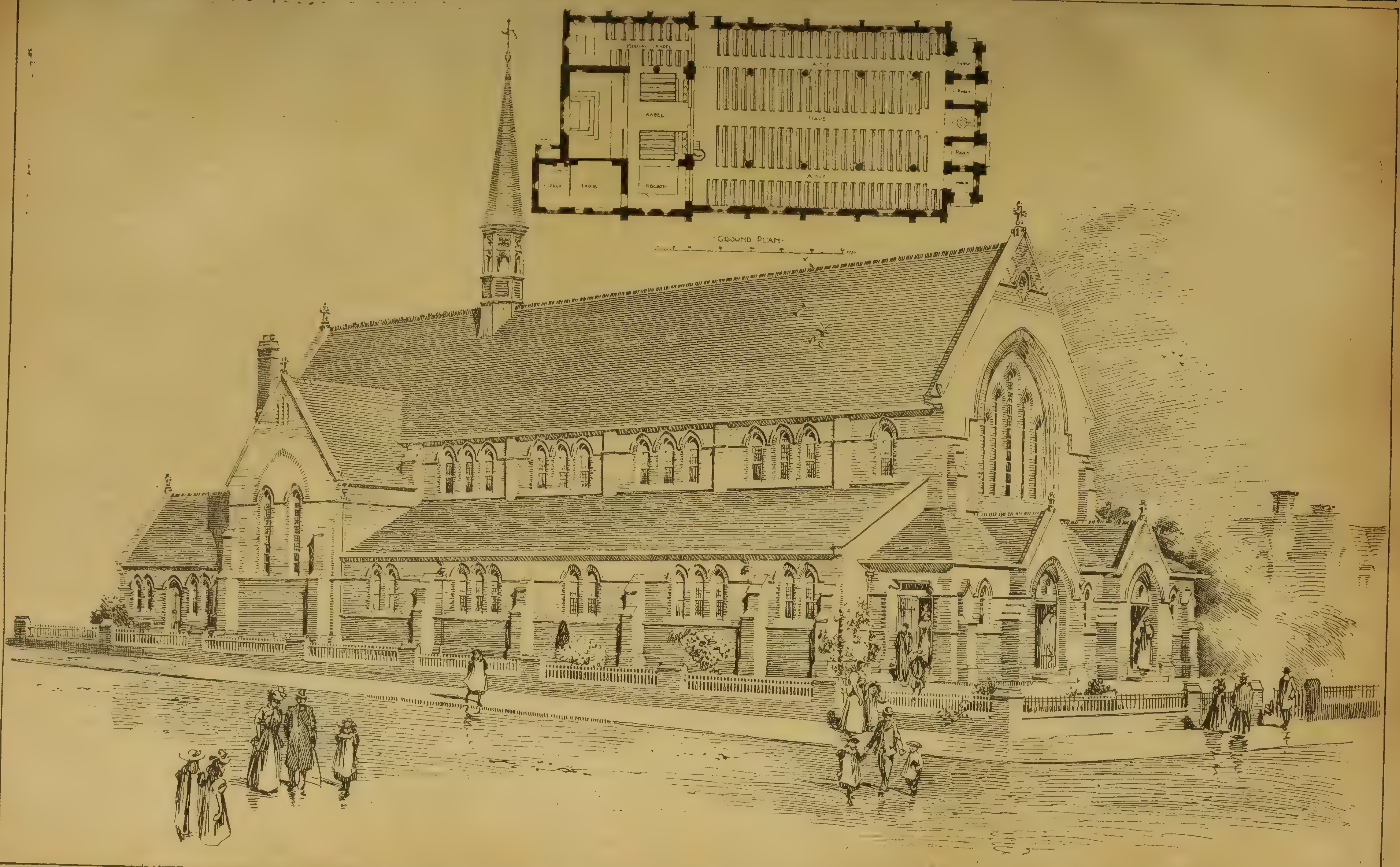


PLAN of FIRST FLOOR.



J. Macintyre Henry
Architect

"PHOTO-TINT", BY JAMES AKERMAN, QUEEN SQUARE, LONDON, W.



ST. MICHAEL AND ALL ANGELS, BECKENHAM.—Mr. Arnold H. Hoole, *Architect.*

WATER SUPPLY AND SANITARY MATTERS.

East Cumberland.—The parishes of Castle Carrock, Irthington, Hayton, and outlying parts of Brampton, Cumberland, have long been in need of an adequate water supply. The Brampton Council accordingly decided to provide such a supply for both domestic and agricultural purposes, and early in 1898 instructed Mr. H. W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and London, to prepare plans for obtaining water from several large springs in the Cumberland fells. Later in the same year the Carlisle Corporation sought and obtained an Act of Parliament to include these springs in the Geltsdale Water Scheme, giving a supply in bulk to the Brampton Council. The latter scheme has, in consequence, been revised, and at their last meeting it was resolved to borrow £11,600 for carrying out the works. There will be about 28 miles of water-mains, and three service-reservoirs holding some 175,000 gallons. This scheme will afford an abundant supply of water to the extensive and dry sandy districts of Hayton and Irthington.

Kingsbury, Staffs.—On October 27, the new scheme of water supply for the parish of Kingsbury was formally opened by the chairman of the Tamworth Rural District Council. The reservoir is 60ft. by 40ft., and will contain 156,000gals. Eight and a half miles of mains have been laid. The supply is derived from three springs near Dumbles Wood, and flows through the district by gravitation. The cost of the scheme has been about £5,000. The mains have been laid under the supervision of the engineer to the council, Mr. H. J. Clarson, whilst the contract for building the reservoir was carried out by Mr. E. Williams, Tamworth.

Manchester.—Mr. Baldwin Latham, Mr. Percy F. Frankland, and Mr. W. A. Perkin, jun., the three experts, the first engineering, the second chemical, and the third biological, appointed by the Manchester Corporation to make recommendations in regard to the disposal of the sewage of the city, have just issued there report. They unanimously approve of the bacterial system as the one best adopted for the purification of the sewage of Manchester. They recommend that the sewage, as it arrives at the works, be submitted to an efficient process of screening, and that it be then passed through the present open tanks. These tanks should be provided with submerged walls and floating scum-boards, so as to retard the flow of the mineral and organic matters in suspension. The effluent from the open tanks should be passed through the double contact beds. Of these double contact beds there should be an area of about 60 acres, exclusive of retaining walls, roads, &c. This estimate is based on a dry-weather flow of 30 millions, and that each acre, being laid out in beds of 3·33ft. depth, with four fillings per 24 hours, would be capable of dealing with half a million gallons of sewage in round numbers, allowing for one day per week rest. The final effluent from the various filters would be collected and conveyed into the existing deep-water culvert which passes through the lands at Davyhulme, and would thus convey the effluent into the Manchester Ship Canal below Barton Lock. With regard to the material most suitable for the bacteria beds, they recommend that it consist of clinkers, of such a size as to pass a 1½in. mesh and to be rejected by a ⅛in. mesh. Efficient means must be provided for rapidly filling and discharging the beds. The beds should be so constructed as to allow of each being used independently. During the occurrence of a storm the flow of sewage should be dealt with in the system of tanks and double contact beds. The excess of flow, after passing through the roughing tanks, should be taken to specially-prepared bacteria beds of an area which will have to be of at least 25 acres in extent. As a safeguard against excessive quantities of storm water passing down at any time, the present sewage tanks may have an increased depth of water put upon them. Finally the experts state their confident opinion that with the system of bacteriological treatment of the sewage of Manchester set forth above, an effluent will be produced which will not only conform with the Mersey and Irwell standard, but which will also materially improve the condition of the Ship Canal. Furthermore, as this system does away entirely with the use of chemicals, and at the same time to a very large extent reduces the volume of the sludge to be dealt with, it is obvious that much of the present expense will be saved by its adoption, and this saving may be taken as a material set-off against the cost of the construction of the proposed works.

Metropolitan Main Drainage.—Complaints as to the insufficiency of the main sewers in various parts of London have been increasingly heard of late, and the attention of the London County Council has been directed to the dangers arising to public health from the periodical flooding of dwelling-houses and other buildings with storm-water and sewage. The whole subject has now been gone into by the main drainage committee of the Council, who have come to the conclusion that the time has arrived when a very heavy expenditure must be incurred by the Council in providing more sewer accommodation. They have accordingly drawn up a report upon the subject which contains important recommendations for the construction of new works. These recommendations are based upon a report by the engineer, Sir A. R. Binnie, whose suggestions, if all are carried out, will involve a capital expenditure of about £3,000,000. At present, however, the committee intend to ask the Council for sanction to proceed with only the most pressing works. The committee have considered what may be the probable future requirements, and they believe that north of the Thames they may, when the whole area is built over, have to provide for an additional population of 271,086, or a total of 3,042,200. With regard to the area south of the Thames which would have to be provided for, they think it may ultimately have a population of 4,054,200, or an addition of more than 2,000,000 to the present number. Sir A. Binnie is of opinion that, in order to bring the main drainage system up to date, the following works should be carried out by the Council:—North of the Thames: (a) Barking to Old Ford—two new sewers and extra works at Barking, £725,000; (b) new sewer between high-level and middle-level sewers, £270,000; (c) new sewer between middle-level and low-level sewers, £500,000; (d) extension of middle-level sewer to Scrubs-lane, £12,000; (e) additional pumping machinery at Abbey Mills, £120,000; total, £1,627,000. South of the Thames: (f) Crossness to Deptford—new sewer (low level), £500,000; (g) Crossness to Catford—new sewer (high level), £520,000; (h) Deptford to Battersea—new sewer, £300,000; total, £1,320,000. Total for both sides, £2,947,000. The committee are of opinion that all these works must ultimately be carried out, but they think that as a commencement of the work the capacity of the outfall sewers should be increased without delay. They according make recommendations in favour of the construction of two new outfall sewers, each 9ft. in diameter, from the Abbey Mills pumping-station to the Barking outfall. The total length of each of these new sewers will be 4⅓ miles, and the engineer estimates the cost, together with that of extra works at Barking, at £600,000. With regard to the south of the Thames it is recommended that an additional outfall sewer, 11ft. 6in. in diameter, be constructed between the Deptford pumping-station and the Crossness outfall works, and a further considerable portion of the suggested new sewer from Crossness outfall to Catford. The total length of the first of these new sewers will be eight miles, and of the portion of the second now proposed to be built 2¼ miles. The cost of these sewers is estimated at £650,000, so that the total expenditure at present contemplated will amount to £1,250,000. It is anticipated that the construction of the works will occupy eight years. The proposals will be considered by the council at its meeting on December 5.

The joint committee of the South-Eastern and Chatham Railway Companies have had plans prepared for the rearrangement of Ludgate Hill Station by their engineering staff and the architects' department, under the personal direction and supervision of the chief engineer, Mr. T. C. Tempest, and these have now been forwarded to the Board of Trade for approval.

The foundation-stone of the new technical schools for Redruth was laid by Lord Windsor on Friday. The building will be in red brick, and the style is Elizabethan, the upper part being relieved by a double string-course in white stone. All the windows will be leaded and glazed in cathedral glass in small squares. The school will contain cloakrooms, classroom, carpenters' and smiths' shops, storerooms, master's room, and lecture theatre, and in the top room of the building will be the nucleus of a museum. Mr. H. R. Lloyd, Newhall-street, Birmingham, is the architect, and Mr. G. Huxley is the builder.

The foundation-stone of a small church in the parish of All Saints', Poplar, to be dedicated to St. Nicholas, was laid on Saturday. The site is close to Blackwall Stairs, to the Blackwall Tunnel, and to the first bridge into the Isle of Dogs. The church, which is to accommodate 300, will be of red brick, with a round apse and narrow round-headed windows.

On Friday afternoon, the Bishop of Stepney dedicated the new tower which has been recently added to Holy Trinity Church, Shoreditch. The block of buildings, to which this forms the corner, comprises practically under one roof a parish church, a settlement, a lodging-house, and other parochial rooms. The whole block, costing about £30,000, has a street frontage of 127ft. by 65ft., and much economy of space has been practised. Sleeping accommodation is provided for 120. The chancel of the church is enriched by pavements of white marble and mosaic, after designs at Ravenna and Monreale in Sicily. It possesses also a curious old crucifix from Moscow.

STATUES, MEMORIALS, &c.

Blackburn.—The memorial statue of the late Mr. Gladstone was unveiled on Saturday by the Earl of Aberdeen. The foundation-base and pedestal of red Peterhead granite comes from the Royal Granite Works of Messrs. James Wright and Sons, Aberdeen. There is a foundation-base, about 6ft. square, on which rests a massive upper base, both of comparatively plain design. Above the upper base comes a moulded plinth, which serves as a bosement for the dado or inscription block. The latter measures 4ft. square by 4ft. 9in. high. Three sides of this block carry inscriptions cut in deep and prominent characters. The die-block is surmounted by a moulded cap, on which a bronze statue by Mr. Adams Acton stands. The pedestal stands about 10½ft. high.

CHIPS.

At Leicester, the commemoration-stone of a permanent church of St. James's, in the London-road, was laid last week. The building will be Basilican in style, will seat 1,000 persons, and will cost £11,000, of which £4,000 has been raised. Messrs. Goddard and Paget, of Leicester, are the architects.

The Bishop of London dedicated the new mission church of St. Alban's, South Tottenham, on All Saints' Day. This church, designed by Mr. Arnold B. Mitchell, is of red brick, the woodwork inside being of an artistic shade of green harmonising with the colour of the brick. The style is Italian and Tudor, well harmonised. At the back are built three rooms, the choir and clergy vestries and parish room. The church will hold 450 people, and is situated in a dense and poor population.

Major-General Crozier held an inquiry at Brentwood last week in respect of applications from the Billericay Rural District Council and Brentwood Urban District Council to borrow £1,600 for works of sewage disposal.

The Light Railway Commissioners have submitted to the Board of Trade for confirmation an order made by them for the construction of a light railway in the county of Gloucester, from Cheltenham to Cleeve Hill.

The organ-case at Westminster Abbey, designed by the late Mr. J. L. Pearson, R.A., is now complete. The Parcell Bi-Centenary celebration in 1895 raised about £1,400, which sufficed to provide the complete case on the north side, over Parcell's grave. The south front was afterwards added in memory of the late Mr. A. D. Clarke, the donor of the celestial organ; and now the south side has been completed at the expense of the Dean and Chapter. At the suggestion of Sir Frederick Bridge, Parcell's coat of arms is to be placed on one of the vacant shields which form part of the design.

A group of mixed schools erected at Lees by the Haworth School Board was formally opened on Monday. They are arranged on the clerestory principle, classrooms opening out on either side of the central hall, and the outlay has been £3,000. Mr. E. P. Peterson, of Bradford, was the architect, and Mr. J. Bottomley, the clerk of works.

The latest report as to the timber trade on the Clyde is that business all round continues active. The sawmills and wood-consuming industries generally are fully employed, and there is no indication of slackening.

The first of a series of three lectures on "Architecture," illustrated by lantern views, was given in the Royal Institution, Colquitt-street, Liverpool, on Saturday morning, by Mr. Arnold B. Mitchell, F.R.I.B.A.

The new police institute at the corner of Dalton-street and James Watt-street, Birmingham, was opened last week. The building is Modern Renaissance in style, and is built of red brick with terracotta dressings. On the ground floor are a gymnasium and recreation-room, and on the floor above are the assembly-room, seated for 300 persons, and a reading-room, while on the floor above are secretary's residence, and five rooms to be let to single men. Messrs. Ingall and Son, of Birmingham, are the architects.

The Bishop of Worcester dedicated, on Friday, in All Saints' Church, Wribbenhall, a chancel-screen and reredos given as a memorial of the late vicar, the Rev. J. L. Chesshire.

The workhouse at Westhampnett, on the road between Chichester and Goodwood, was destroyed by fire on Friday night, the damage exceeding £8,000. Fortunately, no lives were lost, but one aged man died from shock. The building was originally a gentleman's country mansion, the seat of the Williams family, and later it passed into the possession of Charles, third Duke of Richmond. In 1835 it was converted into a workhouse for the Union of Westhampnett, and was leased to the guardians by the present Duke at a nominal rental.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—D. and Co.—E. H. S. and Bro.—M. and M. —M. Bros. and Co.—H. and Co.—Two Years' Student. —H.—P. T. and Co.—E. F.—B. W. A.—S. A. R.— H. von T., St. Petersburg.—R. A.

Builder.—You saw what we said last week? The prices will go lower yet.

Doubtful.—Terribly difficult people to get money of! There was an execution in last week, and another waiting on the top of that.

Enquirer.—You want one of the clever little "Hercules" bogies, made by Challenger and Co., Long Millgate, Manchester. They will move anything, and all public buildings, warehouses, hotels, and places where heavy things in the way of stoves, machinery, &c., have to be shifted occasionally should have one on the premises.

Economy.—You can get Roberts's separator for about £3. You will have no trouble with dirty water then. Why it is not fitted to the roof of every country house we do not know. Clean rainwater is better for every purpose, but comparatively few people seem to think it worth saving.

Winter Garden.—Very cheap and nasty. Better go to a good firm like Messenger and Co., of Loughborough.

Practical.—No single book that we know covers all branches. Write B. T. Batsford, 94, High Holborn, W.C., stating your requirements, he will recommend a selection, and probably sell some of the books at second-hand prices.

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—"Newlyn," "Peirrot," "Apex," "Motor Car." "Falcon," "A Beetle," "Prophet," "As You Like It," "Ocobo," "Stella," "Indian Ink," "Jack," "Ranji," "Rothe," "Englishman." "Ben," "Cromer," "Dreyfus." "Bunker." "My Old Dutch," "Gareloch," "Pat," "Hopeful," "Cedric." "Rapid," "Astragal," "Demophoon," "Allegro," "Alpha," "Septimus," "Pelikan." "Curlew," "Shamrock," "Povey," "Vigornia," "Wold."

Intercommunication.

QUESTIONS.

[11362.]—**Footpath Crossing.**—Would any reader who has experience and knowledge as to who is responsible in the following case, advise me? A suburban tramway company are lowering the road by some property which I am interested in. There is a cartway entrance crossing the footpath which will require altering, as well as part of roadway inside, to suit the reduced level. Who is responsible for this work—the tramway company, the local authority, or has the owner to bear the expense when deriving no benefit, at the same time being put to a great inconvenience?—Petro.

[11363.]—**F.I.A.S.**—Can any of your readers, through the medium of your journal, inform me what architectural society grants the use of the letters "F.I.A.S.," and the address of such society? I recently saw these letters on the plate of an architect and surveyor in South London. They seem to stand for "Fellow Institute Architects and Surveyors"; but I was not aware that any such society existed, and should therefore be glad to be informed as to this?—F.I.A.S.

[11364.]—**Wet and Dry Meters.**—I want to know whether a dry meter is better for a small house having about twelve burners than a wet meter, and also if it is as economical of gas? One gasfitter told me that the wet meter was best and less dangerous. Where does the danger "come in"? A reply will oblige.—Inexperience.

[11365.]—**Underpinning.**—How should this be measured? Is it better to take this with the Bricklayer's work or Excavator?—which? There is the excavation and strutting, the removal of old brickwork, building in cement and wedging with slate. How are these items to be taken—under the separate heads, or together as one item?—Novice in Quantities.

[11366.]—**Iron Roof Truss.**—Will an experienced reader inform me what would be the price per cwt. of a king-post roof, 30ft. span and 10ft. rise, including the labour fixing?—J. I. T.

REPLIES.

[11353.]—**Dispute.**—Of course the question depends largely on the wording of the certificate and contract. If the architect made a note of the contractor's demand, and to what it chiefly applied, the contractor could not run away from his contract. The contractor, if I understand rightly, asked the architect for a certificate indemnifying him from any damage the tenants might do. If the architect has this evidence by letter or in writing, the owners can sue for non-completion. The omission of a word, though unfortunate, would not be sufficient in itself to afford a pretext in the minds of any judge or jury. I am, of course, supposing the contractor is trying to take advantage of a technical error. The contractor might say, owing to the tenants he could not complete work.—G. H. G.

[11355.]—**Artesian Wells.**—In reply to your correspondent B. Walter, he will find what he is requiring, if he writes to us.—John H. Porter and Sons, 165, Queen Victoria-street, London, E.C.

[11357.]—**Damp.**—I do not think Virginia creepers, ornamental as they are, are always desirable on a wall that is exposed to a wet quarter, or is built of absorbent bricks. I think they have a tendency to keep the wall damp, as the sun is excluded. As a damp-proof paint Szerelmey's may be applied. Perhaps the Bath Stone Firms' "Fluate" may be better suited. As to the floor, drain the ground outside, if possible, or use Callender's sheet bitumen.—A. Z.

[11358.]—**Ebony.**—Try J. Gardner and Sons, 123, Regent-road, Bootle; R. Packer and Co., 15, Canada-dock, Liverpool; J. Cameron and Co., Windsor-street, Govan; G. Harrison, City-road, Derby; Witt and Palmer, 168, Drummond-street, London, N.W.; Maple and Co., 263, Euston-road, London, N.W.—Regent's Park.

[11358.]—**Ebony.**—This material can be obtained, 9ft. 6in. long and 1½in. square, of Messrs. F. Marshall and Sons, 256, Old-street, Shoreditch, E. The length is unusual.—H. L.

[11359.]—**Heating.**—Get sight of "Baldwin on Heating"—in this country of Chapman and Hall, London, or at free library. There are over thirty chapters. Chapter XIV. gives pipes, size, area, expansion, &c. Chapter XVIII. on air.—Regent's Park.

[11360.]—**Calculating Weight of Castings.**—Multiply width in quarter-inches by the thickness in eighths of an inch, or vice versâ, and divide the product by 10, then multiply the result by the length in feet, which will give the weight in pounds of that casting. For wrought iron add $^{1}/_{20}$, for lead add $\frac{1}{2}$, for brass $^{1}/_{7}$, for copper add $^{1}/_{5}$ to result. See W. S. Hutton's "Works Manager's Handbook."—Regent's Park.

[11360.]—**Calculating Weight of Castings.**—Take out the quantities from the details of stanchions or columns, and weight out each. No book could give such tables as firms may.—H. L.

[11361.]—**Frontage.**—Brixton-road is certainly unique as regards variety of frontage lines. Some of the new buildings are on the site of old buildings certified under Section 13 of the London Building Act, 1894. Others not so certified have been set back to the general line of frontage. The road is so wide that the question of 40ft. for the width of road does not come in. The Rush Common Act prevails, and the line of frontage has, in consequence, been spoilt.—H. Lovegrove.

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The parish church of Old Lakenham, a suburb of Norwich, was reopened on Saturday after restoration.

A massive monument has been placed in the church of St. Mary Magdalen, Chewton Mendip, in memory of the late Lord Carlingford and Clermont, by his nephews and nieces. It is placed directly under the tablet of the late Countess Waldegrave.

A new organ-chamber at the parish church of Edgmond, Salop, was dedicated on Wednesday evening by the Bishop of Shrewsbury (the rector of the parish). The new chamber has been built on the north side of the chancel, of stone, and in conformity with the general design of the church. It has a wood-lined roof and pitch-pine block floor.

LEGAL INTELLIGENCE.

Paving Liabilities of Owners of Party-walls. —The Marquess of Salisbury v. the Mayor and Corporation of Liverpool.—In this case, heard by Mr. Justice Ridley and Mr. Justice Darling in the Queen's Bench Division on Tuesday, Lord Salisbury appealed, by way of special case, against a decision of the Stipendiary Magistrate of Liverpool, who held that he was liable for certain paving expenses as the owner of premises fronting, abutting, or adjoining on a street which the corporation had paved. The Premier was the owner of certain land between Salisbury-road and Alderson-road, and in 1884 he granted building agreements to Messrs. J. and W. B. Jones with regard to it. When the houses were completed, the Marquess granted a lease for 99 years over the property which faced Salisbury-road. At the rear of these houses was a party-wall adjoining a back street, which the corporation had laid out and paved, and Lord Salisbury was assessed at £100 as his portion of the expenses, although there was no communication from the houses to the street. The lease granted by Lord Salisbury demised the premises to the centre of this party-wall, and it was contended that four and a half inches of the wall adjoining the street still remained vested in the noble lord, and made him liable. The appellant, however, contended that he was not the owner within the meaning of certain local Acts, and that, according to those statutes, Messrs. Jones were the real owners. The appeal was dismissed with costs.

Charge of Collusion between Contractor and Assistant Engineer. — Admiralty Commissioners v. Bligh.—This action, tried by Mr. Justice Grantham and a special jury on Friday, was brought by the Admiralty Commissioners to recover the sum of £1,264 from Mr. Joseph Bligh, contractor. The plaintiffs alleged that on July 15, 1894, a contract was made by the defendant to execute certain works in accordance with plans and specifications which had been prepared, and that the work had been carried out in a defective manner. The defendant pleaded that the work was done to the satisfaction of the assistant superintending engineer. By their reply the plaintiffs said that the certificates said that the certificates for the work were obtained fraudulently and in collusion with a Mr. Monkhouse, formerly in their employ. The Attorney-General, Q.C., and Mr. R. B. D. Acland were the plaintiffs; Mr. Witt, Q.C., Mr. Herbert Smith, and Mr. D. Fulton for the defendant. Mr. Acland, in opening the plaintiffs' case, said that in 1894 the Admiralty were desirous of having erected on the River Medway, above Sheerness and below Chatham, important defence works for preventing torpedo-boats from going up the river. These defence works consisted of an anchorage and a pier. The anchorage was for the purpose of securing a wire rope or hawser boom which should extend from one side of the river to the other, and present a barrier to any torpedo-boat that might ascend the river. The defendant had deliberately departed from the instructions that were given him and had fraudulently put in timber of less scantling than ought to have been provided, as well as less concrete and less rubble, and had so weakened the whole structure that it might have proved to be a danger instead of a defence. On July 5, 1894, Mr. Bligh wrote to the directors of the works at the Admiralty offering to execute the works for £4,940, and the tender was accepted. Counsel then proceeded to read from the specification and the conditions of contract, and said he supposed the defendant was going to rely on certificates given by Monkhouse, who had been in the employ of the Admiralty, and who had given certificates when he was aware that Bligh had only done half the work that ought to have been done. In fact, he and Bligh had conspired together to defraud the Admiralty. As to the anchorage, the piles had not been driven so deep as they ought to have been, and they had not the dimensions required, and they had no iron spikes. The concrete was insufficient, and mud had been left where concrete ought to have been put, and there was not enough rubble filling. As to the pier, there were only half the supports there ought to have been. It was impossible for the certificates to have been given without fraud on the part of Monkhouse and of the defendant. As soon as the Admiralty discovered what had been done they dismissed Monkhouse without a pension. The Attorney-General said that the Admiralty had not done the work over again, but had adopted the cheaper plan of strengthening it. The cost had been £1,264; but from this there was to be subtracted £350 due to the defendant, leaving a balance of £914. Mr. Thomas Sims, superintending civil engineer to the Admiralty, stated that he was at Chatham Dockyard till last year. Monkhouse had been dismissed without a pension in consequence of other questions that had arisen. Witness had tested the works in question. The method of construction was to establish on either shore a permanent structure of piles, concrete, and rubble to receive the end of the wire-rope boom. He tested the structure on the south shore, and it was not so stable as if it had been constructed properly. He made an examination on the north shore, where the anchorage consisted of a rectangular structure of piles with two pile buttresses running out into the river. He drew some of the piles and examined them, and found that they were about two-thirds of the proper length and the other dimensions were also too small. There was nothing in the nature of the ground to prevent piles of the proper length from being driven. A depth of about 12ft. at the bottom of the concrete was not filled in. There was also too little rubble. All this would seriously affect the stability of the structure. The pier next the north abutment contained piles that were smaller than they ought to have been. The piles had gone into soft ground, and some which ought to have been shod were not. The rubble buttresses on each side of the pier were not so deep as they should have been. The bolts in the piles had no nuts, and were, in fact, simply driven in as spikes. As it would have cost so much to take the work down and put it up in accordance with the contract, the work, as done, was strengthened at a total cost of £1,264. At the close of this witness's evidence, Mr. Witt said that he did not see that he ought to resist this claim. It had been pleaded that the certificates had been given, and the whole thing was closed up nearly two years before this case was raised. But he felt that this was no defence in law, and therefore he proposed that the plaintiffs should have a verdict for £914, but that the defendant should have an opportunity of going into the box and explaining that he was not a party to the fraud. The Attorney-General: It is obvious that this transaction could not have been carried out without fraud on both sides. I do not say that Bligh knew of it, but there must have been fraud on the part of someone representing him. Mr. Witt: I do not deny that. The defendant, although he took the contract, was rarely there. Mr. Joseph Robert Bligh was then called, and he stated that he occasionally attended to the work. He had no improper dealings with Monkhouse. Until he received the letter from the Admiralty complaining of the works, he had no idea that there was anything the matter with them. Cross-examined: He ordered the piles himself. They were more than sufficient for the whole of the work.—Mr. Justice Grantham directed the jury to find a verdict for the plaintiffs for £914. His Lordship said that their verdict meant that there had been fraud. It was time that these matters were called by their proper name, though he did not say that this was so serious a case as some they had heard of. The contractors for the Government should know that these matters might be criminal. His Lordship pitied the people who were found guilty of such crimes. Could any punishment be too severe if it turned out to be true that this was the result of a failure of duty? Where a person made a contract on which the safety of the country or of the troops depended, if he committed a breach of that contract, and did so fraudulently, he committed a crime. If the defendant said that he trusted an agent, it ought to be made a criminal offence to trust an agent in this way. Judgment was then given for the plaintiffs for £914.

May Canal Companies Sell Surplus Water?—The question of the rights of the Manchester Canal Company in the surplus water from the Rochdale Canal came before the Court of Appeal on Monday and Tuesday, upon an appeal by the Rochdale Canal Company against the judgment of Mr. Justice Byrne. The real question in the matter is whether the Rochdale Company have the right to sell surplus water to millowners, or are obliged to let it flow to the Manchester Ship Canal. At the close of the case for the appellants the Court gave judgment in favour of the Manchester Ship Canal Company. It was stated that the Rochdale Company has been in the habit of selling water to millowners, and has derived a revenue of £4,000, out of a total of £6,000, in this way. The Ship Canal Company, as the owners of the Bridgewater Canal, took steps to prevent this, on the ground that they were entitled to the waste water from the Rochdale Canal. The question then arose whether the term "waste water" meant merely water which had passed through the locks, or all the water not required for the purposes of navigation. Mr. Justice Byrne held that the Rochdale Company had no power to sell the water at all, and the Court of Appeal confirmed this view by dismissing the appeal. It was intimated that the case will probably be taken to the House of Lords.

A Building Covenant Enforced.—Shoesmith v. Dodd (Limited).—This case, heard on Friday by Mr. Commissioner Bosanquet sitting without a jury, was a further consideration of a case which had been heard before the learned Commissioner at Leeds Assizes. In 1871 certain land at Halifax was sold by auction in lots for building purposes. Among the conditions of sale was the following:—"All buildings shall be erected in accordance with the building line shown upon the plan, and all buildings, stables, and conveniences shall be placed on the westerly side of the lot." The building line was 60ft. from the road, which lay on the east side of the lot. At the auction the plaintiff bought the two lots at the south end of the land and the lots adjoining the north side of those bought by the plaintiff were unsold. The condition above set out was incorporated in the form of a covenant in the conveyance taken by the plaintiff. The plaintiff built on his lots a house in accordance with the conditions of sale, and on March 1, 1897, leased the same to a tenant for seven years, the lease to be determinable at the option of the tenant at the end of five years. On November 6, 1897, the plaintiff by letter agreed to allow the tenant to remove at the end of the term a movable billiard room which the tenant proposed to erect on the front (i.e., the east) side of the house. In the course of the same month the billiard room was erected. It was 32ft. long by 26ft. wide and 17ft. 6in. high, and it stood 10ft. back from the road. It had brick foundations, upon which were laid sleepers imbedded in mortar, and upon the sleepers were timbers which were secured to the foundations by bolts. Then wooden sides were erected in sections, and the whole was covered with a corrugated iron roof. Before the issue of the writ in this action the room had been removed. On July 22, 1898, the lots adjoining the plaintiff's lots were again put up to auction, and the conditions of sale again included that set out above. The plaintiff was the auctioneer, and previous to the sale he stated that the lots were subject to a building-line covenant. The defendants bought the lots, and took a conveyance containing a covenant similar to that in the plaintiff's conveyance. The defendants then expressed their intention of building right up to the frontage of the road, and the plaintiff brought the present action for an injunction to restrain them from erecting any buildings in front of the building line. The defence was that the plaintiff's action in permitting the erection of the billiard-room had disentitled him to obtain that form of relief.—Mr. Tindal Atkinson, Q.C., for the defendants, argued that a party seeking to enforce a condition of this kind must not frustrate the benefit other parties were to receive from it. ("Peek v. Matthews.") Any substantial breach of the covenant on the plaintiff's part would disentitle him to an injunction. Here, the benefit that the other parties were to receive was that the whole space between the building line and the road should be kept absolutely clear. In "Knight v. Simmonds" (1896), "Western v. MacDermott," and "German v. Chapman" the breaches of covenant on the part of the plaintiff had been trivial or temporary. Here the breach was by no means trivial, and as the billiard-room, when erected, was intended to stand for five or even seven years, it could not be called temporary. Nor could the removal of the erection amend the plaintiff's case. The defendants had bought their lots, relying on the plaintiff's inability to enforce the covenant, and the plaintiff could not now alter their position at his option ("Sayers v. Collyer"). Mr. Manisty followed on the same side. In order to disentitle the plaintiff to an injunction, it is not necessary that his breach of covenant should destroy the original scheme; any substantial departure from that scheme is sufficient ("Sayers v. Collyer" and "Knight v. Simmonds"). In this case the plaintiff had done what in him lay to destroy the scheme; if the owner of every lot had acted as the plaintiff had done, the scheme would be utterly gone. Mr. Scott Fox, Q.C., for the plaintiff, contended that it was not every deviation from the scheme that would disentitle the plaintiff ("German v. Chapman"); it was only when he had suffered the whole design to be broken up that he was precluded from obtaining his injunction; that was the true principle of "Peek v. Matthews." Here the design was to have a row of villas instead of a street of houses. That scheme still existed; plaintiff had done it no damage, but such as could easily be—and had been—redressed. The case was strongest against the plaintiff immediately before the sale of 1898, but even then he had done nothing to prevent his enforcing the covenant against the vendor—"Richards v. Revett"—and the defendants, having taken with notice of the covenant, were in the same position as parties to the covenant. The principle running through the whole of the cases, from "Roper v. Williams" to "Meredith v. Wilson," was that where the plaintiff had deprived others of the right to have the general plan enforced, he could not himself claim that right. Here the plaintiff had in no way injured the defendants, and the principle was not infringed. Mr. Commissioner Bosanquet said it was admitted that plaintiff was entitled to his injunction unless something had occurred to take away his right. His Lordship had come to the conclusion upon the cases that the law was this—that in order to disentitle a plaintiff to his remedy by injunction his departures from the covenant must be such that substantially the benefit of the scheme was already lost through plaintiff's acts or with his acquiescence. Lord Justice James in "German v. Chapman" (quoted with approval in "Knight v. Simmonds" and "Sayers v. Collyer") put it on the ground that either (1) the plaintiff has by his acts put an end to the whole object of the covenant, or (2) that he had by his conduct made it unfair that he should enforce the covenant—i.e., that he had apparently given up the intention of enforcing the covenant, and had by that means led the purchaser to buy. Neither of these grounds existed in the present case. It was clear that no one looked upon the billiard-room as damaging the scheme of erecting villas which it was the object of the covenant to protect; and the evidence as to what took place at the auction showed that defendants had full knowledge both of the billiard-room, and also of the restrictive covenant. They took notice of the billiard-room not as something which would injure them, but as something which they might use as a pretext to ignore their covenant. Judgment for an injunction and costs.

A Workmen's Compensation Act Appeal.—"Pavis v. Wills."—In this case, heard in the Queen's Bench Division, on Saturday, by Mr. Justice Ridley and Mr. Justice Darling, the defendant was a builder who was erecting houses at Winstead-road, Battersea. He employed various sub-contractors to do different branches of the work—e.g., for bricklaying, slating, building manholes, plumbing, &c. The sub-contractor for bricklaying—one Manhire—constructed the scaffolding with the defendant's materials, and the Court found that at the time it was constructed the scaffolding was sufficient. Manhire having completed the brickwork, the scaffold remained up for the use of the other sub-contractors, until Manhire could do the pointing. During that interval the plaintiff, who was employed by Jackson, a sub-contractor employed by the defendant for building manholes, was passing under the scaffold on his way to his task, when a slate fell through the scaffold and injured his thumb, disabling him from work for four months. When the scaffold was put up it consisted of five planks and a guard-board. Some one removed three planks and the guard board. There was a heap of slates upon the scaffold, and it was one of these slates which fell through the scaffold upon the plaintiff. At that time Manhire was not engaged on the job. The plaintiff brought the action against the defendant to recover damages for the injuries he had so received. The County Court judge (after two trials) gave judgment for the plaintiff. The defendant appealed. The Court held that the appellant was liable. He was not only the person who had contracted with the bricklayer for the construction of the scaffold, but he was also permitting it to be used by the other contractors so far as they had to use it in their work, and permitting it to remain on the premises upon which they were carrying out work in which he was interested. In this sense he was possessed of it, and if he did not actually provide it in the first instance, there was evidence from which it might be properly inferred that he adopted it as provided for him and allowed it to be used by them, and to be there while they were working. Under these circumstances the rule stated in "Heaven v. Pender" applied, and the appellant, therefore, was liable. The appeal must be dismissed. Appeal dismissed.

Builders' Claim against an Architect-Owner.—Chessum and Sons v. Gordon.—This was an action brought on Wednesday in the Queen's Bench Division, before the Lord Chief Justice and a jury, by Messrs. J. Chessum and Sons, the plaintiffs, against Mr. Herbert Huntly-Gordon, F.R.I.B.A., the defendant, to recover £5,934 8s. 3d. alleged to be due in respect of buildings erected by the plaintiffs for the defendant under an agreement dated April 7, 1898, supplemental to an agreement of December, 1897, and for damages for breach of the said agreements. The defendant denied that he made the agreement of April 7, 1898, and counterclaimed for damages for alleged breaches of the agreement of December, 1897. In December, 1897, the plaintiffs, who are builders and contractors, entered into a contract with the defendant to erect for the latter, for the sum of £7,500, a large block of buildings called Stafford House, between Bread-street and Cannon-street, and numbered 27 and 29, Cannon-street. The defendant, who had recently bought the site of the buildings, was his own architect. The contract provided that the ground floor of the buildings should be completed by March 25, 1898, and that the whole should be completed by June 24, and penalties were provided in case of delay. There was a good deal of friction in the course of the building, chiefly on the subject of extras, but the work proceeded. The defendant desired to carry his premises higher than the buildings which formerly stood upon the site, and he believed that if he could succeed in carrying the buildings up beyond the old height before an injunction were obtained against him for infringement of ancient lights by the owners of the property on the opposite side of Bread-street, the judge would be reluctant to compel him to take them down, and would only order him to pay compensation. He went abroad on March 27 for a holiday, but prior to this he had instructed the plaintiffs' foreman, as soon as the old height was reached, to rush up the work. He also left instructions with his solicitor, Mr. Danvers, to deal with difficulties as they arose. On April 7 Mr. Danvers, purporting to act on the defendant's behalf, entered into a new agreement with the plaintiffs, by which it was stipulated that they should rush up the wall opposite Bread-street, in consideration of which it was agreed that no action should be taken in respect of the plaintiffs' failure to complete the buildings by the time stipulated, and that the plaintiffs' claims as to extras should be admitted. The wall was accordingly rushed up. An injunction was, however, afterwards obtained against the defendant, who was compelled to pull down the wall so far as it exceeded the former limits. The defendant repudiated the agreement of April 7, 1898, when it came to his knowledge, and in May he evicted the plaintiffs from the works on the ground that they had not complied with the contract of December, 1897. The plaintiffs now claimed the amount alleged to be due in respect of the work done by them, together with damages for the injury to their reputation by reason of the eviction. The defendant's case was that when he went abroad he had no reason to suppose that the critical time when the buildings would have reached the height of the old buildings would arrive before his return, and that no authority was given by him to Mr. Danvers to deal with the matter of rushing up the buildings, but that his authority to that gentleman was limited to dealing with the disputes which had arisen as to extras. A large body of correspondence was referred to on this point. The defendant's counter-claim was for the loss he had sustained by reason of the injunction. Three issues were ordered to be tried—(1) whether the supplemental agreement of April 7, 1898, was valid and binding on the defendant; (2) whether the eviction of the plaintiffs was wrongful; (3) the amount of damage done to the plaintiffs' reputation by the eviction. The first of these issues was the only one now tried. The jury, having been asked whether Mr. Danvers had authority to make the agreement of April 7, 1898, replied in the affirmative. It having been conceded that in this event the eviction was wrongful, the issue relating to that matter was dropped, and the remaining issue was referred to Mr. Herbert Steward, the arbitrator agreed on by the parties, who was instructed to find the total amount due to the plaintiffs.

What is a "New Street"?—At West London, Mr. Lane gave judgment on Wednesday on an adjourned summons at the instance of the Fulham Vestry to recover the apportioned sum from Messrs. Simmons Brothers, builders, for making-up Fulham Palace-road, an old parish highway which, it was contended, had become a new street. Mr. Lane said he was of opinion that Fulham Palace-road became a new street in 1883, the gradual process of house building on the east side commencing in the previous year and continuing down to 1896. The contention was that it was not a new street until houses were built on both sides, but it had been expressly decided by two authorities that buildings on one side were sufficient to constitute a new street. With reference to the time, he found that there had been periods ranging from 20 to 35 years, so that in the present case 16 years formed a modest period in the character of a new street. He also found that the repairs to the road were executed by the vestry as surveyors of the highway, and were never intended to relieve the frontagers. He decided in favour of the vestry, and made an order for the payment of the money. With regard to the question of reasonable time he found on the point of the law against the defendants.

Guardians' Dilatory Tactics. — At North London Police-court, on Friday, the Guardians of St. Leonard's, Shoreditch, appeared by their clerk, Mr. R. Clay, to answer a summons under the London Building Act, 1894, by Mr. F. Meeson, district surveyor of Hackney, for occupying a public building in Lower Clapton-road without his certificate. Mr. Meeson said that in May last he found one of the old houses in Lower Clapton-road being used as a workhouse school. He required the guardians to make certain alterations, and to put in a fireproof staircase; but the matter was contested and fought out at that Court, the nominal penalty of 1s. being imposed on the guardians. Since then nothing had been done to meet the requirements of the Act. As there was recently a fire at the house, he now thought it his duty again to bring the matter before the Court. Mr. Clay said that the guardians were most anxious to meet the requirements of the Act, but plans had to be prepared and the sanction of the Local Government Board obtained. Mr. Meeson said that the staircase could have been put in in three weeks. Mr. Fordham: And yet five months have gone by, and nothing has been done. The guardians must pay something substantial. The penalty is 40s. a day. Mr. Clay: It would be hard for the ratepayers to have to pay a heavy fine. Mr. Fordham: The guardians will have to answer to the ratepayers for their delay. I shall impose a penalty of £2 a day for 25 days—£50 and costs.

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Viscountess Galway has presented a stained-glass window to Busbridge Church, Godalming, in memory of her father, Mr. Ellis Gosling, and her brother.

Our Office Table.

In reference to the delay which is occurring with the scheme for completing the filling in with mosaics of the vacant panels in the Central Hall of the Houses of Parliament, a correspondent offers an explanation which throws light on the zeal of the First Commissioner of Works for the advancement of art. Our correspondent asserts that "apart from the fact that no provision was made in the 1889-1900 estimates for continuing the work of mosaic decoration, a pause was desirable to enable the authorities to consider whether a cheaper means could not be discovered of completing the scheme. It was only right that Sir Edward Poynter should superintend the reproduction of the sketches which he prepared for the St. George and St. David panels, but the services of the President of the Royal Academy are an expensive luxury (!), and it is suggested that the designs for St. Andrew and St. Patrick should be intrusted for enlargement to *some less brilliant artist*. The change can be effected the more easily in that water-colour drawings of St. Andrew and St. Patrick were made by Mr. Albert Moore some years ago, and were for a long time on view at the South Kensington Museum."

The Board of Trade has just issued an amended set of rules with regard to applications for licenses and provisional orders under the Electric Lighting Acts, the alterations being in consequence of the Electric Lighting (Clauses) Act passed this year. Formerly it was necessary that each order should set forth at length the purposes for which the supply is to be given, the provisions concerning the breaking up of streets, railways, and tramways, the conditions of supply, the provisions for securing the safety of the consumer and of the public from injury by shock, fire, or otherwise, and the provisions for enforcing the performance by the undertakers of their duties in relation to the supply of electricity. Now, however, all these particulars are to be provided for simply by the incorporation of the Act above mentioned. This change will mean a reduction in the length of the average order to only a few pages, with a corresponding decrease in the amount to be paid for printing expenses by the promoters; and it will also have the effect of lessening the labours of the Board of Trade officials in examining the draft orders.

The first meeting of the 146th session of the Society of Arts will be held on Wednesday evening next, when an address by Sir John Wolfe Barry, K.C.B., F.R.S., chairman of the council, will be delivered. In it it is probable that he will develop the subject of his address last year, "London Communications," and will make some suggestions as to the practical means of carrying his proposals into effect. The succeeding meetings will be as follows:—November 22, "National Forestry," by D. E. Hutchins, Conservator of Forests, Cape Town; November 29, "The Great Seals of England, by Allan Wyon; December 6, "Artificial Silk," by Joseph Cash; December 13, "Sea Angling and Legislation," by F. G. Aflalo; and December 20, "Bi-Manual Training by Blackboard Drawing," by H. Bloomfield Bare, F.R.I.B.A. The programme of papers for meetings after Christmas includes:—"Electric Traction," by Charles H. Gadsby: "Steam Motors for Common Roads," by John I. Thornycroft; "A National Repository of Science and Art," by Professor W. M. Flinders Petrie, D.C.L.; and "Ventilation without Draught," by Arthur Rigg. A course of four Cantor lectures will be delivered on Monday evenings at 8 o'clock, by Henry Hardinge Cunynghame, on "Art Enamelling upon Metals." The first will be given on the 20th inst.

The London School of Economics and Political Science have arranged for several courses of lectures for municipal officers and others engaged in local administration, to be given at their rooms, 10, Adelphi-terrace, W.C. These include a course of six addresses on the historical development of the English Local Government during the present century, by Mr. Sidney Webb, the first of which was given on Thursday, Oct. 26th. Another course of four lectures on "Recent Developments of the Law Relating to Drainage" is to be delivered by Mr. Hirst on Fridays at 7 p.m., beginning 10th November. The lecturer will sketch the existing law of Public Health (London and provincial) so far as it relates to drainage and sewage. Special attention will be paid to doubtful points and recent decisions.

Sir David Richmond, Lord Provost of Glasgow, who is about to retire from office, has prepared a volume giving a *résumé* of the work of the corporation during his term of office. At a meeting of the town council he stated that when he entered the council in 1879 the area of the city was 6,111 acres; the population, 505,000; the valuation of lands and heritages, £3,432,111; the municipal constituency, 63,777; and a penny per pound on the rates yielded £11,250; while at the present date the area of the city is 12,688 acres, the population 747,222, the valuation of lands and heritages £4,780,000, the municipal constituency 108,170, and a penny per pound on the rates now yields £18,360. During those twenty years the work of the corporation has increased, he said, at even a greater ratio. New departments, such as tramways, electricity, baths, washhouses, municipal buildings, and sewage disposal have been created, and the operations of the older departments have grown to an astonishing extent.

The result of fires in several large buildings in Chicago constructed what is known as the slow-burning or mill construction principle is of such an unsatisfactory character that a sub-committee of the Board of Fire Underwriters has been appointed to investigate and report on the value of this method of construction as a means of resisting fire. For years the Underwriters' Association have made a liberal reduction in insurance rates to the owners and occupants of such buildings, but the opinion is gaining ground of late that structures built on this principle are as incapable of resisting fire as are those of ordinary construction, and consequently that the lower insurance rates hitherto accorded them should be withdrawn.

A new stone-sawing machine was tested on Monday at Messrs. David Hall and Sons' Works, Victoria-road, Leeds. It is constructed on a new principle, and the inventors, Messrs. Rhodes and Stead, claim that it will turn out 100 per cent., and even in some cases 400 per cent., more work than any other machines in the same time, with the same cost of power and labour. The machine can, it is alleged, be worked by any person, however unskilful. Within an hour the fourteen blades, each possessing 13in., sawed during the tests two blocks of Howley Park stone, measuring respectively 6ft. by 5ft. and 5ft. by 5ft. A certificate to this effect was signed by Mr. J. W. Mitchell (manager of the Howley Park quarry), and the following quarry owners: Messrs. T. Pawson (Morley), J. T. Biddulph (Bolton Woods quarry, Bradford), and T. Clough (Morley). It was stated that under similar conditions the ordinary stone-cutting machine will only saw 2½in. in the hour at most.

The regents of the Indiana Soldiers' and Sailors' Monument are making an appeal to the *vox populi* with but a dubious prospect of a reliable verdict being obtained. The design for the monument itself, by Mr. Bruno Schmitz, now of Berlin, was selected in a competition notable for the interest taken in it by the profession. The work is not yet complete, but it has advanced far enough to allow some of the sculptured groups to be placed on it, and others are to be added. As those already in place have been criticised by artists, the regents have determined to seek a popular vote on the designs for the remaining groups by sending photographs of the models which have been submitted to the principal cities and towns of Indiana, for public exhibition, inviting, at the same time, observations in regard to them from persons interested. Although the regents do not abandon their control over the choice, it is said that they will be guided to a great extent by the public verdict, which will probably be as valuable as that which might have been pronounced by the porter at Burlington House to whom Beaconsfield alluded at an Academy banquet nearly two decades ago.

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The corporation of Croydon, having purchased the tramways, have agreed to equip them on the overhead system of electric traction, and to lease the undertaking to the British Electric Traction Company, Ltd.

A portrait of Sir David Richmond, the Lord Provost of Glasgow, painted for the Corporation by Mr. John S. Sargent, R.A., was unveiled in the City Chambers, Glasgow, on Monday. It represents his Lordship wearing the uniform of a Lord Lieutenannt and his Lord Provost robes. A half-length portrait, also by Mr. Sargent, was presented to Lady Richmond.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Surveyors' Institution. Opening Address by the President, Mr. T. Miller Rickman. 8 p.m.

TUESDAY.—Institution of Civil Engineers. "The Waterloo and City Railway," by Mr. H. H. Dalrymple-Hay; and "The Electrical Equipment of the Waterloo and City Railway," by Mr. B. M. Jenkin. 8 p.m.

WEDNESDAY.—Society of Arts. Opening Address by Sir J. Wolfe Barry, Chairman of Council. 8 p.m.

FRIDAY.—London Schools of Economics. "Recent Developments of the Law relating to Drainage," by Mr. C. Hirst. Section No. 1. 10, Adelphi-terrace, W.C. 7 p.m.
Architectural Association.—Discussion Section. "Tenement Houses for the Working Classes," by Mr. Robert Williams. 7 p.m.

CHIPS.

Princess Christian visited Brighton on Tuesday afternoon to open the Princess Christian annexe to St. Mary's Hall Clergy Daughters' School, Kemp Town. The total cost of the new building and improvements to the old building was £2,200.

The memorial-stones of a new Baptist chapel in Pershore-road, Balsall Heath, were laid on Monday. The edifice, which will be built of brick with red terracotta dressings in Modern Renaissance style, will provide accommodation for 700 persons. The joinery work will be executed in red deal, and the roof will be open-timbered. Attached to the church are vestries for the use of minister and choir, and at the rear is a lecture-hall accommodating 400 persons. Messrs. Ingall and Sons, of Birmingham, are the architects, and Mr. A. J. Teall is the builder.

The municipal dwellings for the industrial classes, which have been erected by the Shoreditch Vestry on the Britannia-street, Provost-street, Moria-place, and Plumbers-place area, Hoxton, in the midst of a dense poor population, will be formally opened on Monday afternoon next by the Earl of Rosebery.

The proposal that Manchester should purchase its Royal Infirmary has been abandoned, the committee of the corporation, who had charge of the matter, having resolved not to proceed further with the negotiations, in view of the attitude of the council. The sum of £350,000 was named as the price.

The Birmingham and District Clerks of Works and Builders' Foremen's Association has been reorganised, and has arranged for a series of lectures by architects and other experts. The first of these was delivered on Friday night at the Midland Institute to an audience of about a hundred and fifty. Mr. A. Freeman Smith gave an address on "Styles of Architecture," illustrated by diagrams and limelight views.

The new fever hospital, Cape Town, South Africa, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke-flues, patent Manchester grates, and under-bed ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

The Bishop of Bristol was present on Friday at the inaugural service in the new Mission Church, Union-road, situated in the parish of St. Silas, Bristol. The structure occupies the site of an old mission-hall, and will hold 500 persons. The building has been constructed of Winterbourne stone, with Cattybrook brick facings, and covered with Broseley tiles. The roof is of open timber, pitch-pine. There are vestry and classrooms and other accommodation. The architects were Messrs. Munro and Son, and the contractor was Mr. A. J. Beaven, of Bristol.

It was stated at the Rochester Bankruptcy-court last week that J. T. Parson, until recently carrying on business as a builder, contractor, and timber merchant at Erith, and against whom a petition had been filed in bankruptcy, had absconded.

It is stated that negotiations are being carried out with a view of constructing an electric underground railway for Manchester, which, if completed, will connect all the city railway stations.

In the case of George Frederick Mashford, of Cleethorpes, builder and contractor, the order of discharge from bankruptcy has been suspended for three years, ending September 20, 1902; and in that of Joseph Nettley, also of Cleethorpes, and likewise builder and contractor, a similar order has been made to expire on the same day. In that of William Wade, of the same place and of like occupations, the order of discharge is suspended for two years, ending Sept. 20, 1901.

Alterations are being made to the Congregational chapel at Beccles, from the designs of Mr. A. Pells, architect, Beccles, and special attention has been given to the ventilation, which will be carried out on the Boyle system.

Trade News.

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WAGES MOVEMENTS.

NEWPORT, MON.—The stonemasons, who had been on strike since the beginning of May, have now effected a settlement with the employers. They returned to work on Monday.

WEST BROMWICH.—The secretary of the West Bromwich and District Master Builders' Association (Mr. H. Smith, jun.) has received a notice from the operatives' section claiming the following advanced rates and altered conditions:—Bricklayers' wages to be increased from 8½d. to 9d. per hour; time and a half to be paid for all work done during the night; no apprentices over eighteen years of age to be taken on; no firm to be allowed to have more than two apprentices at one time; no bricklayer to be allowed to teach more than one of his own sons the trade; labourers' wages to be advanced from 5½d. to 6½d. per hour.

Mr. T. Jenkins, of Burton-on-Trent, has been appointed architect for new premises for the local branch of the Young Men's Christian Association about to be erected in the High-street of that town.

Dr. Tristram, Q.C., Commissary General for the Diocese of Canterbury, held a court in that city on Wednesday, to hear an application by the city council for a faculty to demolish the disused church of St. Mary Bredman, in the High-street, to remove certain mural tablets, and to exhume and rebury any remains of bodies found underneath. The church was built in 1822, and is now in a ruinous and dangerous condition. The Commissary General granted a faculty to pull down the church and to remove the tablets on the usual conditions.

Mr. W. R. Slacke, one of the inspectors of the Local Government Board, held an inquiry at Heckmondwike on the 2nd inst. respecting the district council's application for sanction to borrow £19,260, £14,000 being for electric-lighting plant, £3,438 in respect of public baths, £1,540 for the purchase of land as a site for public offices, and £282 for the erection of a fire-station.

Mr. William Merryweather, contractor, of Bristol, died on Sunday at his residence, South View House, West-street, Bedminster, aged 69 years. He was vice-chairman of the Bedminster Board of Guardians for a long period.

The work of reconstructing the tramways at Southampton from the Prospect-place Junction towards Portwood is proceeding merrily, and the old lines have been removed to nearly as far as the Ordnance Office. It is expected that the section as far as the Stagg Gates will be out of hand by Christmas. After Christmas the High-street and Above Bar portions of the line will be taken in hand, and completed in time not to interfere with the spring trade, and then the Portswood section will be recommenced. Mr. F. Osman, of Southampton, is the contractor.

The death was announced from Paris, on Tuesday, at the age of 66, of M. Aristide Croisy, the sculptor, whose best-known works are the Sedan monument and the Chanzy memorial at Le Mans.

The Bishop of Brisbane (Dr. Thornhill Webber) has arrived in London, having come home for a few weeks only, on business connected with the plans of the proposed cathedral at Brisbane.

The Bishop of London and Viscount Cranborne, M.P., on Saturday last laid the foundation-stones of a new church to be known as St. George's, Waltham Cross. A sum of £3,000 having been collected, a start has been made with an edifice which will cost £8,000 and accommodate 750 persons. Mr. J. E. K. Cutts, of Southampton-street, Strand, is the architect, and Mr. S. J. Scott, of London Wall, the builder. The church, when completed, will consist of chancel, side-chapel, chancel-aisle, nave and aisles, clergy and choir vestries, and a tower and spire. The sitting accommodation will be 750. The portion of the church now in course of erection consists of the chancel, side-chapel, chancel-aisle, and two bays of the nave and aisles. These will be seated in such a manner as to hold 520 people. The church is being built of red bricks and Bath stone, covered with tiles. The dimensions will be: Chancel, 40ft. by 25ft. by 52ft. 6in. high; the nave, 89ft. by 25ft. by 55ft. high; the whole internal length will be 129ft., and the width 54ft. Until the tower is built, a bell in a cove over the chancel arch will be used.

The Institution of Civil Engineers opened its winter session at its offices in Great George-street, Westminster, on Tuesday evening, when the new president, Sir Douglas Fox, delivered his inaugural address, reviewing the progress of electrical and sanitary engineering, discussing problems of railway construction, and enumerating some of the more important problems confronting civil engineers in the coming century.

An inquiry has been held by Mr. H. Percy Boulnois, M.Inst.C.E., on behalf of the Local Government Board at Chatham, into an application of the town council for sanction to the borrowing of the sum of £7,500 for the purposes of the town-hall and municipal buildings. The town clerk explained that the money to be borrowed was to pay for the completion of the work at the town-hall, including the lighting by electricity, the placing of an iron sewer under the building, the furnishing and fitting of the building and offices, the architect's commission (£1,112) on the whole expenditure, and legal expenses. The contract price for the erection of the town-hall was £20,598, and additional expenses brought up the total to £22,541.

The foundation-stone of new Salvation Army barracks was laid in Hall-lane, North Walsham, last week. The building, which will seat 270 persons, is being erected by Mr. Laycock, contractor, of that town.

The Aberdeen City and District Lunacy Board have purchased the estates of Kingseat and Rainnieshill, measuring altogether upwards of 1,500 acres, and costing about £34,000, for the purpose of a new lunatic asylum. The buildings committee have been authorised to obtain plans for the building and to accept tenders.

The secretary of the North-Eastern Railway Company has sent a communication to Sunderland Corporation informing them that on certain conditions the North-Eastern Railway Co. are willing to promote a Bill in next session of Parliament for the construction of a new high-level bridge over the Wear.

Sir H. Jackson, in his report on the state of Gibraltar for 1898, says that the chief public works of general importance were those in connection with the naval docks and the inclosed harbour, the north end of which is formed by the commercial and coaling moles. Another important work, which was finished during 1898, was the new main sewer, which conveys the whole drainage of the rock to an outfall at the southern end below the Europa Point Lighthouse, whence it is carried away to the open sea by the strong current in the Straits.

The contract for the erection of the chimney at the Plymouth electricity works has been completed. The actual cost of the works has been £2,495, against an estimated expenditure of £2,522. The cost of the extensions of plant works, necessary for the supplying of electricity to the Compton section of the trams, as proposed, is estimated at £20,000. The additional plant would more than double the possible output from the works.

The Bishop of Coventry consecrated on Friday the new portion of the nave of All Saints', King's Heath, Birmingham. The extension will give 350 additional places, and the cost, £2,500, includes the provision of a vestry.

New premises for the Manchester Guardian Society for the Protection of Trade are in course of erection on a site at 15, Fountain-street, Manchester. The building is to be of brick and stone, with an elvation to Fountain-street of grey Aberdeen granite, with polished columns and doorway up to the level of the first-floor windows. Messrs. Wilson and Toft are erecting the building, from the plans and under the superintendence of Mr. J. W. Beaumont, architect, also of Manchester, and the work is expected to be completed by September next. The total cost (including £10,000 paid for the land) is estimated at about £21,000. The foundation-stone was laid on Monday.

Dr. Flinders Petrie, who has been delivering a series of lectures on Egyptian Art at the Alexandra College, Dublin, has been indisposed recently, and has been obliged to postpone the delivery of two of his lectures. Dr. and Mrs. Petrie are the guests of Mr. Gerald Balfour, M.P., and Lady Betty Balfour at the Chief Secretary's Lodge.

The Queen will send the following loans from the Royal Collection at Windsor to the Eleventh Exhibition of the Artists' Guild: contemporary drawing of Queen Elizabeth, workbox given by Charles I. to the ladies of Little Gidding, coloured prints on satin of George III. and Queen Charlotte, and five portraits on silver by C. de Passe. The exhibition will be opened on Tuesday next, at three o'clock, at the Royal Albert Hall, by Princess Christian, and will remain open the three following days.

A new board school was opened in Windsor-road, Hackney Wick, by the Hon. Lyulph Stanley, who explained that accommodation was provided for 298 boys, a like number of girls, and 331 infants. The new building consisted of four floors, with a hall and six classrooms on each. A separate building was provided for backward children and laundry and cookery centres. The cost worked out at £25 a head, which was a long way above the old-fashioned estimate of £10 a head. But in this instance they had had many difficulties, as anyone who knew the district, which was below the water-level, would appreciate.

THE BUILDING NEWS
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WALHAM GREEN PUBLIC BATHS COMPETITION.

THE designs submitted for the proposed new baths and washhouses for the Walham Green district of the parish of Fulham are on view at the vestry hall, and number 29 sets. Three of these have been selected by the assessor, Mr. Frank T. Baggalay, F.R.I.B.A. The long and somewhat awkward site rendered it impossible to obtain any external effect, and the commissioners did wisely to direct their efforts to obtain the best and most economical plan, and not to require elevations or perspectives, as these would have been confined merely to a representation of a narrow frontage in Melmoth-place, Walham Green, with shops on each side. Those who have attempted an elevation have not been very successful in designing a suitable entrance to a set of baths between other houses. The site occupies a long area, about 587ft. long and 84ft. wide, in the centre of a building area. It has a frontage of about 127ft. to Melmoth-place, and has a back entrance to Hartismere-road, so it is practically inclosed on all sides except in the frontage. To find accommodation on this narrow strip of land for first- and second-class swimming-baths, a ladies' swimming-bath, slipper-baths, establishment laundry, public washhouse, and also means of communication with each of these for the two sexes separately, in addition to various offices and conveniences, was not an easy matter; but several plans exhibit ingenuity, sometimes rather strained, in providing for the separate entrances and arranging the corridor approaches; some show more skill than others in economising the length of corridors.

The design placed first by Mr. H. Dighton Pearson, A.R.I.B.A., Teddington, has a spacious entrance for both men and women on the main front, and the three large swimming-baths are in line on the north side of site. The men's first and second-class entrance form the two left-hand corridors, the former gives access to the second-class baths and club-room. The swimming-bath, 125ft. by 33ft. pond area, with 121 boxes, is placed by the side of the establishment laundry; drying-room, &c., and is on the north side. The men's second-class slipper-baths is next the corridor, and has 41 baths. There is a convenient club-room between the two large swimming-baths, these being in line on the north side. The first-class men's corridor adjoins, but runs not quite so far as the first, in fact as far as an inner hall between the two classes of slipper-baths. Each of these has its own waiting-room. The hall gives access to the men's first-class swimming-bath, 100ft. by 30ft., with 70 boxes. A cloakroom for ladies is placed next their swimming-bath, which is the next bath, and is 60ft. by 20ft., with 31 boxes. It is alongside the men's first-class slipper-baths; it has its own waiting-room in front, next the entrance. The women's first and second-class slipper-baths adjoin in front, and have separate entrances, the first class being nearest to the entrance. The corridor approach to the ladies' bath is thus shorter than the last—in fact, the three main corridors stop successively at the men's second-class swimming-bath, at the men's first-class swimming-bath, and at the women's swimming-bath. The establishment laundry is conveniently placed at the end of the large baths, and in communication by corridor with each department, and also in the rear with the back entrance, washhouse, boiler, &c., so that the towels can soon be cleaned and dried, and conveyed to any bath; next the drying-closet is a towel-room. The sections show iron-framed roofs, with lantern skylights running along the roof. The corridor entrances are divided into classes after the front entrance or vestibule is passed. This has a refreshment-room for both sexes between the two approaches for men and women, also a pay-office and superintendent's office in front, thus economising the labour of attendants between the two classes.

The requirements asked for have been supplied with few exceptional details. An iron ornamental arched rib with spandrel-roof and lantern is shown over the men's first-class swimming-bath. These ribs spring from an inner line of iron columns, which carry the gallery of bath.

The second prize design, by Mr. H. Druery, of Putney Hill, has also merit. The men's and women's entrances are divided by pay-office; the women's waiting-room and their first- and second-class slipper-baths are on right-hand side of corridor. On the men's side is the refreshment-room, with bar to right, and waiting-room and slipper baths of first class on left. The corridor is not straight, as in the last, but turns a right angle round the waiting-room of second-class men's slippers to first-class men's swimming-baths, 100ft. by 32ft. The ladies' swimming-bath is well separated, with entrance and dressing-room. The club-room is between first- and second-class swimming-baths for men; the latter is 125ft. by 34ft. The washhouse in the rear is connected with the ironing and mangling room, and there is a back yard, with matron's and waiting-room, &c. In this plan the main corridor extends as far as the entrance to second-class swimming-bath. The establishment laundry is in the basement, and is next to boiler-house and under the washhouse—hardly so convenient a place as the ground floor. The plan groups the ladies' baths together; their slipper-baths surround two sides of the swimming-bath. The corridors are well lighted by skylights. There is a good side area at north of main swimming-baths, and the arrangement generally shows a careful study of the requirements of public baths, though not so happy in its distribution and corridor communication and entrance as are some others.

The third selected design, by Mr. T. W. Aldwinckle, F.R.I.B.A., is a well-considered plan. The entrance is separated by ticket-office and refreshment-room. The ladies' swimming bath, 60ft. by 20ft., is on left side, with open area at end and side, and in connection with their second-class slipper-baths. Their first-class is placed on the other side of corridor. The waiting-rooms are conveniently placed. The men's entrance leads into a long side corridor to establishment laundry, and gives access to the men's first and second-class swimming-baths. A club-room and douche-room are between them. The men's first-class slippers are placed in area behind the shops on left side, and their second-class slippers are at one end of men's first-class swimming-bath, and approached by main corridor. We are doubtful as to any advantage in separating the two classes of slipper-baths, and we believe the best and most economical arrangement is to place them as near as possible together or at the end or side of their respective swimming-baths. There is a gallery to men's second-class swimming-bath, and a large side area is left on the north side of baths. The recess for boxes on this side is a feature. The washhouse and laundry arrangements are well studied, the superintendent's quarters are over entrance, and the details of plan are generally satisfactory.

There are other plans which run very closely the selected three, one or two of them that have merit of a high order. The first of these has its ground plan numbered 64, we believe by a well-known specialist in baths. The entrance is recessed with glass roof over the men and women's entrances, a feature of much value. Separate halls are provided for the two sexes; the ladies' on the north side leads to an inner hall, with their first and second class slipper baths on right-hand side, and also to their swimming bath, entirely cut off from the men's side except by a private communication. The men's corridor leads from a square glass-domed hall to first-class waiting-room, slipper-baths, and swimming-bath 100ft. by 30ft. This arrangement is very compact; the corridor leads also to clubroom and to second-class baths for men. The plan is arranged so that each swimming-bath has its own set of slipper-baths alongside and its own waiting-room and entrance. The lavatories, &c., are well placed to open-air areas. The establishment laundry (an important office), washhouse, and ironing-room is connected by a delivery communication room and store with the baths and a separate entrance and approach from Hartismere-road. The public washhouse and laundry are next courtyard, and well planned. We also like the refreshment-room with bay window to yard in front, which is convenient from hall. Two shops are shown on each side, which form the recessed entrance. The plan is decidedly a good one.

In No. 69 the author also has a quadrangle entrance from Melmoth-place, between the shops. From this quadrangle the several entrances open. There is a men's entrance-hall and a women's hall divided by the ticket-office. From an inner hall in the women's side the swimming-bath, 60ft. by 20ft., is approached on the north side, and also through waiting-rooms to their slipper-baths, first and second-class—a compact arrangement. On the left side—the men's—is a long administrative corridor, the whole length of site to back courtyard, and a short central corridor running between men's slipper-baths and ladies' swimming-bath gives access to men's first-class swimming-bath. A staircase hall and club-room, with w.c.'s transversely placed, give a good entrance to the men's swimming-bath. The refreshment-room is divided for men and women. The second-class men's swimming-bath is at the further end of site, with slipper-baths attached on south side. The establishment laundry, with open area, is reached by the administrative corridor, and communicates with washhouse. There is a large courtyard at back, with waiting and ticket-office, and a side area is obtained on north side of men's first-class swimming-bath.

No. 67 plan is irregular. The entrances with refreshment-room between. The right-hand entrance-hall and corridor lead to men's "slippers" first and second class, on right to swimming-baths of both classes—one placed on south side, and the other on north. The range of slipper-baths on north side following boundary is long, and the crooked corridors are objectionable. The women's swimming-bath for 48 boxes and their slipper-baths are approached from left through a hall, and their "slippers" are behind the shop. The establishment laundry is on south side, approached by official corridor on left of men's second-class swimming-bath. The arrangement of the large swimming-baths and "slippers" is not satisfactory—the large baths should be in line. No. 74 has a courtyard entrance in front behind the shops, with entrances to baths. The ladies' swimming-bath is placed with its end to Melmoth-place, and there is a slanting and awkward-looking corridor into it on the inner end. The men's first-class "slippers" are on the north side of courtyard, and the second class further on. The corridor-approach to men's second-class swimming-bath is narrow, and the corridor arrangement is defective. No. 27 has also a front courtyard set back, ladies' swimming-bath in front, and "slippers" along north side. The large swimming-baths for men are on south side, and the establishment laundry at end of second-class swimming-bath. The offices and waiting-rooms look cramped.

We can merely glance at a few of the other designs of merit. No. 46 is compact, and the baths are arranged between two long side corridors. No. 30 shows careful study of the requirements; the whole frontage is occupied by four entrances, administration, superintendents, men, and women's. No. 23 has a fairly good arrangement of entrances and halls, but the isolated men's second-class corridor for part of its length is not desirable. No. 21 has also some good points in plan, but the ladies' slipper baths are not compact. There is also some merit in No. 9. There is an entrance courtyard recessed between men's and women's slipper baths. A large side area is shown for future extension, which is not required, and the want of a communication to washhouse, except through men's second-class swimming baths on one side, is unsatisfactory. Some carefully-drawn detail is shown in No. 7. No. 1 shows the swimming baths for men, separated by slipper-baths for both sexes.

The competitors were left to decide on many of the details, as the position of the establishment laundry, washhouse fittings, the number of dressing boxes, the position of slipper-baths, the dimensions of slipper-baths, the fittings of baths, the frontages, the number and size of offices, &c. From the large number of queries made, nearly 100, it would appear that the competitor had many doubtful points to settle; but as these have all been printed and answered for all alike, there can be no question as to the intention of the committee. Had lateral entrances been possible from the side streets, the great length of corridors would have been avoided, as it is, the swimming-bath farthest from the entrance has to be approached by a long corridor, and this, in some cases, has been carried through to the back entrance as an official communication. There are manifest advantages in a through corridor from back to front, though some have broken the length by placing the establishment laundry at the side, and a very long corridor is never a pleasing feature. The roofing of so many corridors and baths on different levels will be a costly item. The sum of £35,000 is the limit proposed by the commissioners, and this amount is to include the complete equipment of the baths and the architect's commission. This sum is a low one, and would be insufficient to carry out two or three of the designs exhibited.

THE NEW ENGLISH ART CLUB.

THE Dudley Gallery opens with a fairly strong exhibition of the works of a school of young painters who put on canvas and paper "what they see, not what they are expected to see." There are scoffers of this view—those who would call many of the works hard, crude, and stupid. Nevertheless, we can see much to admire in such works as those of A. W. Rich (5), J. E. Grace, Terrick Williams (70), Bernhard Sickert, Geo. Thompson, Professor F. Brown (119), P. Wilson Steer (116), Bertram Priestman, and a few more. In the first part of gallery, a number of studies and sketches in pen-and-wash, water-colour, and chalk are seen, among them a simply washed pen sketch of an avenue of trees, with children in the foreground, by A. E. John; a clever, delicately-drawn study of "Clematis" on a wall, by Hugh Carter; a broad, mezzotint-like sketch of "Ipswich," by A. W. Rich; a vigorous sketch, "Ploughing," by Miss Mellie Fisher, and an evening effect of a wood, by Thos. E. Francis (12). M. Bauer's large interior, "Westminster Abbey" (16), is rather gloomy; it is probably a view on a dark day, but the painter has endeavoured to give the mingled effect of light and gloom or chiaroscuro, and has produced a rather confused impression. There is breadth and colour in Miss G. Smith's "Old Mill" (19). Nice grey tone is seen in Francis E. James's view of the Thames from Tilbury; and the studies by Sir W. Eden of "Glencoe," by H. B. Brabazan from "Lago Maggiore," and Bernhard Sickert's "Midsummer Fair, Cambridge" (43) are interesting. A. S. Hartrick has a large chalk drawing of "The Bell-ringers," and a water-colour "The Tryst" (82), a young lady on a reedy bank of a stream overshadowed by green trees—subtle in colour, and sincere. In W. W. Russell's (55), "The Bower," with two little girls reposing under the shade of trees lit up by flickering sunlight and dappled grass, we see something of Claude Monet's impressionism, a realistic record of fleeting vivid light and colour, in which the pigment is superposed thickly to catch the light. The same effect is obtained in P. Wilson Steer's "Under the Trees" (116), where the sparkle of sunlight on the foliage and figures reposing on the grass is produced by a solid *pâte* of colour in the painting. The technique is somewhat artificial, but the effect is to produce a vivid impression of light.

D. Muirhead renders nature broadly, and the tone of his landscape (56) is pleasing. "Hilda," a little girl's portrait, with light on face, is a clever pastel study (69). Quite Netherlandish in its style and execution is Ernest Oppler's "A Dutch Kitchen," a woman peeling apples; her daughter stands by the side of a table, conversing or looking on; the light and tonality of the picture are successful. George Thomson's "Durham," a view of the city overlooking the house-tops with their slate roofs, with the cathedral rising above in a heavy grey sky, is truthful in its atmosphere. He has two other studies of the city—one (103) an evening effect, and the other showing Prebend's Bridge. A sunny effect is shown in P. Wilson Steer's "Children Playing," but the landscape lacks repose and shade. W. H. Bell's "Wimbledon Common" has pleasant colour. D. S. MacColl sends "Marble Hill House, Twickenham" (67), another view of which is sent by Roger E. Fry. "Poole Harbour" (70), by Terrick Williams, has a sunny brilliance and sparkle of light on rippled water, with its craft and cloud effect, full of harmony trembling in luminous colour. There is broad handling in H. Masterman's "Broadstairs," with its chalk cliff; and Henry Tonks, in his group of holiday children and folk on the beach, "The Sand Castle" (73), has given us the impression of sand and sea, with a row of bathing machines. Full of character and expression is Francis Dodd's portrait of Allan Monkhouse (79). Miss Ethel Walker paints "Angela," a young lady in evening dress standing over a fireplace looking at a vase. There is some grace in the figure and rich colour of the dress—grenadine, lined with yellow. As a study of country life, Miss C. L. Christian's landscape "The Pond" (85), with horses drinking—a summer effect—is subtle in its light and delicate colour; and her other picture, "The Avenue," is promising. "The Green Wave," by W. Shackleton (87), is a study of luminous sunlight and colour. Two nude girls, with golden hair, are leaning themselves against the timber-work of a groyne, a large green wave breaking over them. We might almost fancy two mermaids disporting themselves: there is a kind of *mélange optique* in the subtle light and luminous colour. Miss Ethel Walker paints, "In the Orchard" (95), two young ladies in white: one reposes in a garden-chair, the other stands conversing; but both are under the shade of trees, through which the sunlight plays and dapples the ground—very graceful. Moffat Lindner is a dexterous colourist, his "Dutch Barges" (96) are brilliant in pearly and golden tones. Chas. Furse sends "Design for a Spandrel in the Liverpool Town Hall" (97). The grouping of the figures, which represent apparently Merchandise, with the masts of vessels in the background, is masterly in composition and colour. Perhaps the colour is too sombre for a decoration scheme, and ample light would be necessary to make the design discernible if placed at any great height; but the artist has very cleverly disposed the figures of the men in the triangular space, and they have mobility and grace of outline. "Over the Valley," by Professor F. Brown, hangs below. The colour of the landscape and the deep sky tones are rich and strong. A portrait of a little girl, daughter of the Hon. Mr. and Mrs. Pleydell-Bouverie, by W. Dacres Adams, is an out-of-door study, natural and childlike. A mansion forms the background. Miss A. S. Zileri has a delicate harmony of creams and greys called "Symphonie de Couleurs Claires," a charming still-life study of glass and leaves. "Miss Johnstone Douglas," by S. J. Douglas, is almost like a Reynolds in the pose and colour. "Au Petit-Clou, Dieppe," is a large and masterly drawing of the old church and market-place, Dieppe, by F. Forster (122); the artist is an architectural expert; the details of turret and towers are firmly drawn. W. Osborne's "A Summer Night" (120) is a clever twilight effect, with cottage, and the glimmer of lighted windows. An effective landscape is painted by B. Priestman, a country common; a man and horse have crossed a stream which runs across a rough road, grey rainy clouds overcast the sky. Douglas Robinson's well-modelled semi-nude figure, "Sleeping Girl" (131), and pictures by Moffat Lindner, "On the Maas," pearly in tone, and the park scene, with ladies about to bathe in a placid lake, with water lilies, by G. Reid, "Tranquillity," are other works to notice.

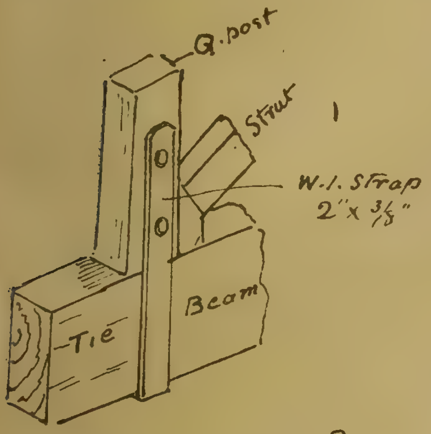
ESTIMATES.—XXX.

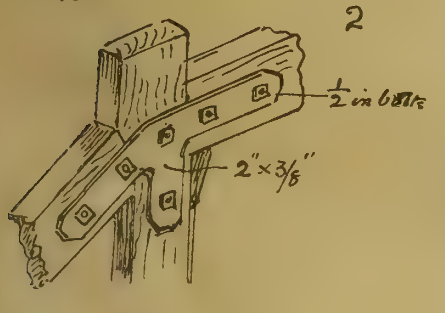
CONSTRUCTIONAL IRONWORK, WROUGHT IRON, ETC.

TENDERS for constructional ironwork, based on properly prepared drawings, details and specification, would of course, include the connections and attachments of girders and joists, columns, and in the case of iron trusses, all connections between principals, king and queen rods, iron tie-rods, struts, and shoes, including angle-iron pieces, plates, gusset-plates riveted to the members at the head and feet of king-rods, &c. Yet in many cases it is necessary to obtain an approximate estimate of the work as a guide; in which case first the quantities of T and angle iron and rods have to be found to obtain the weight of metal; and secondly, the labour required in drilling the rivet and bolt holes, besides the number of bolts, nuts, and screws; and thirdly, the labour in hoisting and fixing. These items must be priced out with the aid of tables of weights and prices current, as we have shown in the item of Roof-truss. Jordan's "Weights of Iron and Steel" will be found useful for calculating the weight of L, T, U, I, and other sections of rolled iron. These are often troublesome. To find, for instance, the cost of the attachment between T-iron principals with the king, or the connection to tie-rod: Sometimes two gusset-plates are used, to which the web of principals and a flat bar king are riveted. These plates are cut of an irregular lozenge shape, and are ⅜in. to ½in. thick, and there are usually six rivets required. The feet of T struts and king bar also are connected to a flat bar tie-rod in a similar way.

It is necessary to obtain the superficial area of these shaped plates, and calculate their weight at so many pounds the foot for the thickness; then there is the drilling and riveting. The customary king-rod has, instead of plate connections, a cast-iron head, through which the king-rod passes, and is screwed up, and at the foot the round iron king is made to pass through a hole in the tie-rod, which is flatted out for drilling, and the king-rod is secured by a nut below. The side T-struts have also to be cut, and the top flange bent or forged to fit over the flat part of tie-rod, and the king-rod passes through both (see sketch 6). The pricing of these joints is troublesome. It is a question of labour of the smith, and how long he would take to form the connection. The best way of estimating the labour of these items is to obtain the experience in a workshop.

In estimating weights, we have already shown how to obtain the weight per lineal foot of a wrought-iron bar (see p. 610) and angle and T-iron can be found by adding the flat parts of the iron, deducting thickness of metal, then multiplying by the fraction; thus the weight of angle-iron 3½in. × 3½in. by ½in. will be—



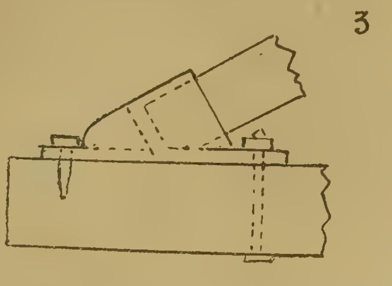


$$(3\tfrac{1}{2} + 3\tfrac{1}{2} - \tfrac{1}{2}) \times \tfrac{1}{2} \times \tfrac{10}{3} = 10{\cdot}83\text{lb. per lineal foot.}$$

Add for rivet heads 5 per cent. on the weight of plates. To find the weight of flat bar and plates the rule is: Breadth by thickness × 3·333 = weight of 1ft. long in pounds, and for round bars, diameter squared × 2·618 = weight of 1ft. in pounds. A bar of wrought iron 1in. square and one yard long, weighs 10lb., which is equal to the weight of a square foot of wrought iron ¼in. thick, and a bar of the same section 1ft. long weighs $3^1/_3$lb. or 3·3lb., hence the rule above. It is also useful to remember that a foot square of wrought iron weighs 5lb. for every eighth of an inch of thickness, so that a plate ¾in. thick of that size would weigh 30lb. and a 1in. plate 40lb.

As we have said, it is necessary to dissect or analyse any piece of ironwork like a wrought-iron girder or truss—that is, to take out the weight of each part separately, and then add them together. Thus, in castings the weight of bracket stiffeners may be taken in cubic inches; each inch weighs ·262lb., or ¼lb.

The current prices of rolled iron joists, Belgian, is about £6 10s. per ton; English joists £8 5s. to £9 per ton; wrought-iron girder plates £8 15s. to £9 15s.; bar iron, Staffs, £8 7s. to £9 7s. 6d.; angles 10s., and T's 20s. per ton extra. As there are 20s. in the £, and also 20cwt. to the ton, it is easy to convert the cost per ton into the cost per cwt. by calling the pounds shillings. Thus, £9 per ton will be equal to 9s. per cwt., £8 per ton will be 8s. per cwt., and so on, and any number of shillings can be found by taking the proportionate parts of a pound and calling them pence—thus £8 15s. per ton equal 8s. 9d. per cwt.



75cwt. 1qr. in 12 rolled iron girders, 25ft. in length, 10in. by 4¾in. by 4¾in., and hoisting and fixing to floors.

This weight would be equivalent to 6¼cwt. each girder, and the weight is 32lb. per foot run this section. The prime cost per ton would be about £8 15s.

	£	s.	d.
Cost of girders, per cwt.	0	8	9
Extra cost per ton, for extra 5ft. length, 7s. 6d., equal to, per cwt.	0	0	4½
Hoisting to floors, per cwt.	0	0	6
Fixing	0	1	6
Per cwt.	0	11	1½

1½cwt. Bolts, nuts, and washers for flitch-plate girder, ¾in. diameter and 6in. long.

This may be fixed at £1 4s. per cwt.

No. 24. Plates 8in. by ¼in. for rolled girders.

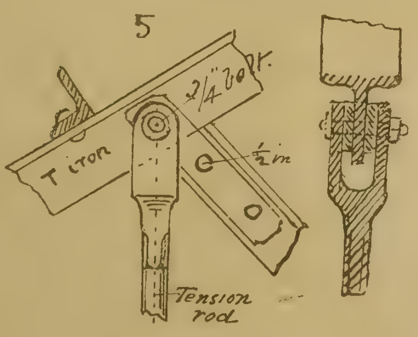
These are worth about £8 10s. per ton.

60cwt. in compound riveted girders.

These may be priced at £11 10s. to £12 per ton, so that this item would work out, say, £34 10s.

No. 560. Holes for ⅞in. bolts through ½in. iron.

Say, 1d. to 1½d. each. As a rule, the rivets and holes are included in the price of the rolled girders and trusses, such as those for the cleats to the struts, and for the L iron purlins. These holes are generally done by steam drill. For girder plates the holes are easily and quickly drilled by placing the plates upon each other, and drilling through all the thicknesses at one operation, the top plate, being drilled first, becomes a guide for the drill. Time is saved by this method, and the holes are more accurately formed.



No. 6. Fitting ends of 10in. by 5in. rolled joists to compound girders.

These ends will have to be forged, and secured by short pieces of angle iron bolted through the webs of both. These should be included in price of the girders or joists, as it is only possible to give an approximation of price. The labour, forging, and cutting the ends of joists, and bolting the angle pieces, would be quite worth 3s. to 4s. each for this number.

No. 12. 4in. by 4in. angle iron in pieces 9in. long, and fitting to ditto.

	£	s.	d.
10lb. angle iron at 1d.	0	0	10
Heating and cutting to lengths, say	0	0	6
Two holes for bolts, through ⅜in., punched	0	0	4
	0	1	8
Profit	0	0	2
	0	1	10

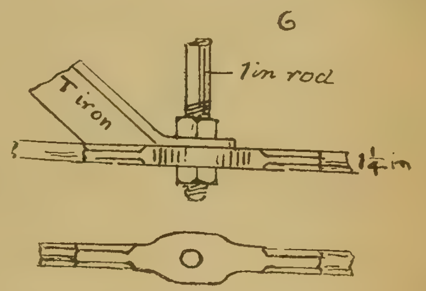
56lb. in straps for trusses. (See sketch 1.)

These are intended to secure the ends of queen-posts to tie-beams, or principals to tie-beam, and king-post, &c., and may be priced at 4d. per lb. Say:—

	£	s.	d.
Cost of straps, per lb.	0	0	3½
Labour, fixing	0	0	2
	0	0	5½

No. 4. Straps 1¾in. by ⅝in. to trusses and fixing.

These would probably be to secure king-post to tie-beam. According to table, the weight of 1ft. of flat bar iron ⅝in. thick of this width is 3·68, say 3¾lb. These straps would be about 30in. long each; then, if we multiply the weight per foot, 3¾lb. by 30in., = 2ft. 6in., we get 9·2lb. as the weight of each strap, and at, say, 4d. per lb., the cost will be about 3s.



	£	s.	d.
Cost of one strap	0	3	0
Six holes for bolts, drilled through ⅝in. iron, say 2d. each	0	1	0
Labour, fixing, at, say 2d. per lb.	0	1	6
Cost of one strap	0	5	6

No. 20. Straps bolted through on both sides of queen-post trusses of the shape shown in sketch 2, each 2in. by ⅜in., and six ½in. bolts to each pair.

It is necessary to find the weight of these straps. Each strap would be about 2ft. 9in. long by 2in. by ⅜in., and a flat bar of this size weighs about 2½lb. per foot, so that each strap will weigh nearly 7lb., and the total weight may be roughly calculated as 140lb., or 1¼cwt. Say:—

	£	s.	d.
Cost of straps and drilling holes, per lb.	0	0	3½
Bolts and fixing, say	0	0	2
Per lb.	0	0	5½

Or about 19s. per cwt. for iron only.

No. 8. Cast-iron shoes to trusses, as per detail. (See Fig. 3.)

These would probably have a base-bed of 1ft. 3in. by 9in.—say about a foot square. A foot square of 1in. metal would weigh about 37lb.; the socket part would be equal to about another foot square, or 74lb. in all.

	£	s.	d.
Cost of one shoe, say	0	9	6
Two bolts, say 2ft. long, would weigh about 5lb., at 4d.	0	1	8
Fixing	0	2	6
	0	13	8

1,212cwt. in rolled iron joists of different sizes and lengths (stock sizes).

This is a large order, and we may price these at £6 10s. per ton (Belgian make).

	£	s.	d.
Cost per cwt.	0	6	6
Hoisting and fixing	0	2	6
Per cwt.	0	9	0

If English joists, the cost per ton would be £8 5s., equal to 8s. 3d. per cwt.

310cwt. in wrought iron plate girders, 18in. deep, 19ft. long each, hoisting and fixing. These may be put at £9 10s. per ton.

	£	s.	d.
Cost per cwt.	0	9	6
Hoisting, &c., 12ft. high, per cwt.	0	0	9
Fixing	0	1	6
Per cwt.	0	11	9

38ft. run. 4in. by 4in. angle iron, riveted to web of girders.

This angle iron is probably to take a plate for joists, and will weigh about 13lb. per foot run, or, say, 4½cwt. Angle iron is worth 10s. per ton more, or £10.

	£	s.	d.
Cost per cwt.	0	10	0
Drilling and riveting, say	0	4	0
	0	14	0

5cwt. Flitch plate to wood breastsummer, and eight bolt holes, bolts, &c.

This is worth about £9 per ton, or 9s. per cwt. The bolt holes may be put down at 6d. each. Say :—

	£	s.	d.
Plate, per cwt.	0	9	0
Bolt holes, per cwt.	0	0	10
¾in. bolts, nuts, and washers, per cwt. 8d. each	0	1	2
	0	11	0

No. 4. Wrought-iron king-post trusses to roof 23ft. span, principals of T-iron. 4in. by 3in. by ½in., struts 2½in. by 2½in. by ⅜in., the bar 3in. by 7/16in., king-bar ditto, gusset-plates 5/16in thick, with ¾in. rivets, &c.

As no weight is given we must take out quantities of iron for one truss and weight out.

26ft. of T-iron principals, 4in. by 3in. by ½in., at, say 11lb. per foot.
13ft. of T-struts, 2½in. by 2½in. by ⅜in., at 5·83lb.
23ft. of flat bar tie, 3in. by 7/16, at 3 77lb.
6ft. 6in. king-bar ditto, at 3·77lb.
Gusset plates, 5/16in. thick, with ⅜in. rivets at connections of principals, and king struts, shoes, &c., at 15lb. per foot, including rivets.
Each truss about 4cwt. 6lb., at say, 16s. per cwt. £3 5 0

No. 4. Purlins of L-iron, 3in. by 3in. by ½in., each 40ft. long.

	£	s.	d.
These will weigh about 6·24lb. per ft., or 260lb. each = 2cwt. 19lb.	1	16	0
Drilling and riveting per cwt., say	0	7	6
	2	3	6

Iron-trussed roofs not exceeding 25ft. span, including wrought-iron trusses, purlins, boarding, slating, and leadwork measured on slope, may be constructed for about £7 to £8 per square.

WATER-COLOUR DRAWINGS.

A VERY fine collection of water-colour drawings of an architectural character, by Mr. Herbert J. Finn, is on view at the Modern Gallery, 175, Bond-street, and should be seen by all admirers of our ancient ecclesiastical edifices. We noticed some time ago his very beautiful drawings of architectural work in the same gallery, which comprised drawings of Winchester Cathedral, Canterbury Cathedral, and other works. We now direct our readers' attention to the remarkable series of water-colour drawings, chiefly of Oxford and of Canterbury Cathedral. One of the finest drawings of the former series is that of the Tom Tower, Christchurch. Mr. Finn is a master of perspective, both linear and aërial, and he has also the gift exhibited by very few architectural draughtsmen of making architectural subjects pictorial and interesting. These are really artistic drawings, in which the artist's grasp of colour, light, and shade effects are seen to great advantage. Mr. Finn also knows how to give the effect of mouldering stonework, and to throw over his work the glamour of romance which we see in such drawings as Magdalen Tower, with its sunlight effect, and Christ Church, from Aldgate. The Front of the Old Ashmolean, with its coupled Corinthian columns to the porch, is charmingly drawn. We also notice the fine bird's-eye view of Oxford, showing the innumerable spires bathed in pale sunrise, a beautiful example of draughtsmanship. The Radcliffe, the west window Merton Chapel, Corpus Christi Quadrangle, the fine Renaissance Laud's quadrangle, St. John's College; St. Mary's Porch, the corner of Radcliffe-square with St. Mary's in the background, outside the Cloisters, Magdalen College; and Oriel College quad are all well-known examples of architecture. The broken tints and soft crumbling look of the stone are cleverly rendered without any opaque colour or adventitious aids. The series of drawings illustrating Canterbury Cathedral, especially the general view from Westgate; the splendid views "Morning" and "Evening," showing the cathedral tower and cloisters, one under the morning sunlight, imparting a silvery shimmering effect to the tower and nave, and the other in warm evening light, are equally beautiful. The "morning" effect is extremely delicate and silvery. There is also a west-end view, showing the effect of a warm glow of light on the cathedral, taken from roofs, seen through a haze of smoke. The cloisters, Norman staircase, Lanfranc's Norman doorway, &c., are very clever. We also notice a few landscapes and views of Arundel, Pegwell Bay, Harlech Sands, and other landscapes which show breadth and rich colour in another field of study.

THE ARCHITECTURAL ASSOCIATION.

THE third ordinary meeting of the Association was held on Friday evening at 9, Conduit-street, W., the President, Mr. G. H. Fellowes Prynne, in the chair. The following fourteen new members were elected :—C. Thunder, H. B. Squire, W. A. Scott, W. H. E. Roberts, E. D. Niscon, T. J. Müntzer, J. A. Hossack, E. Gunn, M. J. Dawson, H. H. Dawson, H. P. Carter, C. T. E. C. Brooks, E. E. Bowden, and E. G. Allen. Ten nominations for membership were read. On the motion of the PRESIDENT, a vote of condolence with the family of the late Sir Arthur W. Blomfield, A.R.A., a past-President of the Association, and also with that of Sir Thomas N. Deane, of Dublin, was carried. Mr. E. B. CARGILL announced that, in the unadvoidable absence from town on the 15th prox. of Mr. Gerald Moira, who was announced to read a paper on that evening upon "Colour Decoration in Relief," Mr. ANDREW OLIVER had kindly undertaken to give an address on the Streets and Buildings of Old London, illustrated by lantern views.

MARBLE.

A paper on this subject was read by Mr. WILLIAM BRINDLEY, F.R.G.S. The address was illustrated by numerous water-colour sketches by the lecturer of rock scenery near quarries in Carrara, Athens, Eubœa, in Spain, near the Red Sea, and in other parts of the world, by a large number of large photographs of landscapes and historic buildings, and by a profusion of specimens of the most costly marbles and porphyries, many of these being resplendent in hues or distinguished by their translucency or beauty of figuring.

THE ORIGIN OF OUR MARBLE.

In architecture, the word "marble" conveys, said Mr. Brindley, the idea of a stone of more importance than an ordinary building material. It is a stone always possessed of some special beauty, either in texture, colour, or both, and of sufficient hardness to take a polish. The varieties are almost infinite, and, as numerous as they are, it is rare that any two quarries are precisely the same; there is always an individuality of some sort or other. We have marbles of one uniform colour, as white, black, grey, red, yellow, green, and so on; but in all cases, even in whites and blacks, there are differences. The whites of Carrara, Italy, vary from those of Greece, Spain, and America. The blacks of Belgium are not the same as those of England and Ireland. The serpentines of the Lizard, Cornwall, vary from those of Banff, in Scotland, and Anglesea, and further vary from those of the Continent and America. These variations are not to be wondered at when for a moment we study their origin and the different changes they have gone through as part of the earth's crust. Their ages are equally wide, some being, comparatively speaking, recent, while others are old, and some very old. The white crystalline marbles are now conclusively proved to be nothing more than ordinary sedimentary limestone rocks, like our chalk cliffs, or carboniferous rocks, which have gone through a process of cooking or baking under great pressure, while being hermetically sealed by overlying rocks, which have kept in the gases, causing the limestone rock to crystallise and alter its nature to that extent that rarely any of the fossils are now discernible; in short, a new rock is produced. There are other whites that have been produced by hot springs carrying in solution a large quantity of lime and silica, which deposit directly the carbonic acid gas is liberated in the atmosphere, often producing a rock of the purest whiteness, or coloured by any metal that the hot water may pass through. Black marble is a sedimentary limestone coloured by carbon, which colour is immediately destroyed by heat, producing the whitest of lime oxide. We get black marbles with white veins. These white veins are usually younger than the rock itself, being infillings of the cracks produced by different causes, in the history of the rock. These remarks about black rocks apply equally to red and yellow ones. Another class of marble, the Breccias, have gone through all sorts of nature's changes and disturbances; they are rocks that have been broken into irregular fragments, and been cemented together again by nature, and after that in some cases have gone through a baking process and the like. Nearly all our green marbles are earlier rocks that have been altered, and in some instances been broken up and re-cemented, like Verde Antico. The greens are nearly all magnesia, while the whites in the same mass are lime; occasionally we get both white and green magnesia in the same mass.

THE VARYING QUALITIES OF MARBLES.

This slight geological introduction will prove to you that as marbles are produced under such varying conditions, the quality must be equally various, both in hardness and durability. Again, some marbles, like the Purbeck, are not much more than tremendously compressed mud and fossils; others are only baked, compressed clays. When used in damp situations, these often go back to their original elements, and it further happens that a marble that behaves fairly well in Italy frequently will not stand at all with us. And there are marbles that, like building stones, have to be placed on their natural bed. Most marbles will stand in isolated shafts, or engaged pilasters, but experience shows us that only a very limited number used as slabs for wall linings can resist the moisture of a newly-built wall. The destructive power of this moisture, be it hydraulic or chemical, is such that it very shortly destroys the face of many marbles; all those of a slatey or sedimentary nature face-bedded go directly—for instance, the Swiss Cipollino, but if cut across the bed stands fairly well. Then again, certain marbles, like Purbeck, Emperor's Red, and Verona, which consist chiefly of flattish fossil shells, these, when face-bedded on damp walls, become pitted with small holes, while across the bed they stand all right; nearly all this class of fossil marble is only obtainable in thin beds, so a large slab has to be face-bedded. These same remarks apply to certain red marbles found near Carrara, which are red clay compressed and baked by the same heat that has produced the crystalline whites.

THE GREEKS' USE OF THE MATERIAL.

When the Greeks used marble in architecture it was always treated as an ordinary building stone. No attempt was made to save material. Everything was massive, and the blocks were ground or rubbed together until the whole structure was next to homogeneous without the aid of mortar or cement. Their columns, as you are aware, were built with thick drums; these blocks were worked roughly in the quarries, with projecting bosses on the sides, to which, most probably, were attached some wooden arms to enable the blocks to be revolved forwards and backwards, on the wooden centres, until the two faces came together with an almost invisible joint. When built the whole column mass was skilfully masoned into a pillar with all the Greek subtlety of diminishing entasis and delicate flutings. The durability of this work, had it not have been for earthquakes and the ravages of man, would have been perfect now. Those who have not seen the Acropolis of Athens can scarcely realise the beauty of this immense marble pile; the sublimity of colour is in harmony with the subtlety of form. It is not the cold white marble of Italy, so common with us, but a translucent warm ivory tint, often becoming ochre yellow. This deep colour, which is only surface, is usually attributed to great age; but this is not correct, as is proved by the colouring of recent fractures on the Parthenon, and by modern buildings in Athens, a good example of which is a high slab plinth round the Royal Palace. This marble is already nearly as yellow as the Parthenon. The marble contains minute crystals of iron pyrites, the decomposition of which yellow ochre colours the marble. In the Greek temples of Delphi, Sicily, and Pompeii, the common worked stone was plastered over with a marble-like stucco, which is thought to be marble dust with lime and albumen. I think now from what I saw recently in Greece that it may be white crystalline marble not quite burnt through into lime. This I saw being finely crushed with rollers by horse-power for plaster-work.

EARLY QUARRYING.

There is no doubt the Greek methods of quarrying became the Roman; but it is impossible to imagine that the Greek could have quarried better than what we find now remaining of Roman work, and this not only in the white quarries of Pentelicus, but in the various coloured quarries found in many of the Greek islands. These old Roman workings you can always tell at a glance by the carefully tooled upright face of the rock. I saw lately in an old quarry on the island of Scyros an axed face some 60ft. high. Although the Romans took over all the Greek white quarries, they were not content with this, but opened quarries of choice colour wherever they could be found, and these they worked for monoliths to embellish their buildings in Rome and colonial cities. The Roman method of quarrying monoliths for shafts and architraves was by working them *in situ* engaged to the parent rock, either horizontal or vertical, according to the bedding and the solidity of the rock. In the Verde Antico quarries the upright large semicircular hollows remain, showing where the great Justinian columns for St. Sophia, Constantinople, were got. Sarcophagi were quarried by being worked all round engaged to the rock at the bottom; they were then wedged off. In the old Carystian quarters of Cipollino, there are many examples of both finished and unfinished work *in situ*. In one quarry, some two thousand feet up the very steep mountain side of "Oche," on a shelving mass of rock overhanging an awful precipice, are eight columns, 39ft. long, beautifully wrought, with entasis and top and bottom members quite finished and ready to be fixed, probably in the portico of a temple like that of Antonius and Faustine in the Forum of Rome; one of them is only a few feet off the sloping edge of the precipice. How they contemplated getting them away is and must, I fear, ever remain a mystery. In addition to these finished columns, there are several of similar size, partially wrought, engaged to the horizontal face of the rock; other immense masses were stepped and partly worked for various purposes.

WHITE MARBLE.

Roughly speaking, perhaps, three-fourths of the white marble used in the world at the present day comes from the Carrara district of Italy. The marble mountains extend some twelve miles; they consist of mountain peaks going up to an altitude of 6,000ft. The sides of these mountains are scored with valleys and ravines which have only three outlets—Carrara, Massa, and Seravezza. On the sides of these valleys are the different quarries, of which there are some 600, "producing annually about 200,000 tons." The water coming from these ravines turns innumerable sawing mills, which slab annually some 60,000 tons of marble. The towns are full of workshops and studios. The marble businesses support in the district some 10,000 people. Any young man who likes mountain scenery, with picturesque sketching and architecture, cannot find a hunting-ground anywhere to surpass this. He will come across beautiful Byzantine, Mediæval, and Renaissance work in marble that cannot be surpassed, or rarely equalled, in Italy. It was the land of the Medici, the playground of Michel Angelo and Donatello. I believe a young man could spend a month, pay his fare from London and back, hotel accommodation, including food and Chiante wine *ad libitum*, for less than it would cost at an English seaside town. He would also pick up a little Italian. Nearly all the best statuary of the world is quarried at Mont Altissimo, Seravezza, near Carrara. This is the famous H-marked statuary of commerce, H being for Heuraux, the proprietor. In Italy there are also old white quarries near the coast not far from Grosetta, between Pisa and Rome. The Cathedral of Milan was built from quarries above Baveno. Spain has several extensive deposits of white marble. The best is the one the Moors used at the Alhambra, the quarries of which I visited some years ago; they are at Macael, between Lorca and Baza. There is a good quality of white marble in Trazos Montes, Portugal, where an enterprising company formed at Oporto ten years ago quarried £20,000 worth without any prospect of getting the blocks away, and there they are now, and there they are likely to remain. France has white marbles at St. Beats, but there is little demand for them, although there is a considerable duty on foreign produce in France. Norway has extensive deposits, but very little of it is good. Some was used for ashlar at the Junior Constitutional Club; it seems to be standing very well. The finest quality is at Velfiord: it is only about 100ft. off very deep water for shipping. There is further north a crystalline white marble, which is a dolomite. The late war of the Greeks and Turks would seem to have enriched the Athenians, for they are pulling down the old buildings and erecting lofty Pentelic marble ones in their places. They are full of architectural detail, which is very well done. The marble is chiefly obtained from the south or Athens side of the mountain, near the ancient workings. A company is now working north or Marathon side. I have examined the different quarries very carefully, and am of opinion that they are the same beds as the south side; but the famous old cave statuary is not yet found. They are extracting large blocks, some of which are being used in the safety repairs of the Parthenon. We are working blocks of this marble, which those interested can see. It is considerably harder and more costly to work than Carrara.

QUARRYING.

In marble quarrying considerable skill and judgment is required; the mass of rock is rarely solid enough to be stepped down as in ordinary stone quarries, and blasting cannot be employed, except for clearing away masses of inferior material. The colouring and marking of such marble as Pavonazzetto does not extend through the face of the rock, but is a veined mass or bed in the statuary formation, the same quarry producing first and second quality statuary and first and second Pavonazzetto. The system is, when a choice solid mass is found, to work away from the top and sides all inferior rock round the good mass. It is then sawn or wedged into blocks as large as can be obtained free of shakes. A few months ago I saw in the quarry of Crestola a solid mass so cleared of about 100 tons, worth over £1,000 sterling. The removal of the blocks when quarried is done in a very skilful manner by a specially trained group of workmen, and it is surprising with what ease and rapidity they will remove blocks, often 25 tons weight, from the quarries and down a steep declivity to the loading place, where they are taken away on a specially-built truck drawn by sometimes as many as thirty-six oxen. There are no lifting cranes in the quarries—only crowbar levers are used. The men get round the block, each with his lever, and they all lift at the same instant, the signal being given by a lively sing-song. The blocks are lowered down the mountain-side by means of ropes passed round posts. The block, being on a sort of sleigh, is slid over hardwood sleepers greased with a bar of soap. A man rides on the block, and passes the sleepers given him from behind to front. The old Rhondona and Breche Violetts are usually underground quarryings, and extracted by the aid of long saws, a channel being cut first over the block to free it from the roof, and a chamber at each end for the men to saw in. By this means they sometimes get a block of sufficient size to produce two monolith columns 14ft. long. The red Levanto Breccia and Genoa green is also sawn out of the rock. The re-found Verde Antico of Thessaly is a hard Breccia of greens, greys, and whites. The quarrying of this is by the aid of the wire saw, which is a three-strand endless steel cord of over 2,000ft. in length running over descending pulleys, and being fed with sand and water: this cuts the marble. This method of extraction is the latest and most improved, as it in no way injures the marble. It was from the quarries of Synada, in Asia Minor, that the Romans got their beautiful red purple-veined Pavonazzetto, and all other sorts of this marble. These quarries also produced a beautiful pure white statuary, and a rare variety of delicate flesh tint. (There was hung on the walls of the lecture-room a series of photos of these quarries taken by Baron Schwiter; also specimens were shown.) The antique marbles, Numidian Yellow, Laconian Red, Thessalian Green, Africano Breccia, Carystian Cipollino, Egyptian Porphyry, Laconian Serpentino, Breche Universal. These are unique, and have no modern representatives. Unquestionably the best yellow marble known is the Giallo Antico of the Romans. The columns of the Arch of Constantine, which were Trajan's, and half those of the Parthenon, are of this marble. It varies from deep ochre yellow to pale and a delicate rose colour; its markings are red and blue purples, the grain is crystalline, and it is translucent. This is the marble found in the encrustation of the palaces of the Cæsars, the baths of Carracalla—in short, it was the only yellow used in old Rome. The quarries, which are very extensive, are in Tunis, near the frontier of Algeria; they were extensively worked about fifteen years ago by a Belgian company, which went to grief owing to having an engineer as chief of the quarries, instead of a practical quarryman. The next in quality is the yellow of Sienna, which is familiar to all. The best quality of this yellow is now not obtainable. Beautiful panels are often seen in old Adam's chimneypieces. The South of France, Spain, and North Italy produce about a dozen yellow varieties, but they are all inferior in quality to the two first named. The coloured marble most used by the Romans was the Carystian (Cippolino) from the Island of Eubœa; there was more of this used in Rome than all the other colours put together. The first reason may have been owing to the immense size monoliths could be got as supports for their porticos and basilicas; but great quantities were also used for decoration. It opens out into chevron pattern more beautifully than any other marble. There are dozens of old quarries on the Island of Eubœa that have been examined by French, Germans, and Italians during the last twenty years, for the purpose of reworking; but in all cases it was found that the Romans had taken all the good stuff away. About four years ago, a mountain that slopes down to the sea and away from any mule track or other path was found on its sea-face to have a large number of old quarries. These contain an almost inexhaustible quantity of first-class marble, which can be got in large sizes. These quarries I am now working, and those interested can see monoliths made of it, some 14ft. long, for Mr. Bentley's new Roman Catholic cathedral at Westminster; and you will also see it used by Mr. T. G. Jackson at the Royal Academy in the vestibule improvements. Some twenty years ago a Swiss Cippolino was found, with colourings very similar to the old, but with very different markings, as it does not produce, when opened out, grand patterns, and, although it stands well in detached monoliths, experience proves it will not stand on new walls or floors.

ONYX MARBLES.

Some thirty years ago a very extensive deposit of Arragonite was found near Tlemcen in Algeria, and the old quarries were here from which the Moors obtained this beautiful marble so plentifully used in their mosques at Tlemcen. The purchaser of these quarries was Signor del Monti, an Italian resident at Oran, and he it was who for commercial purposes named the material onyx, from its translucency, like the finger-nail. This misnomer "took on," and is now generally applied to all this class of very translucent marbles, some of the most beautiful of which have of late years been found in Mexico and in South America. Just recently it has been found in the Caucasus. The name onyx appears very appropriate, but it would be better to call it lime onyx, so as not to confound it with onyx proper, which is silicious. The formation of this material is most likely a deposit from hot springs, such as goes on now at several well-known springs in different parts of the world. The rock Oriental alabaster was used extensively by the Egyptians, and the most exquisite example is the famous sarcophagus in the Sir John Soane Museum. The Egyptian quarries are in the eastern desert; they were reopened and extensively worked by Mahomed Ali for his great mosque at Cairo. The beautiful monoliths which support the baldachino over the high altar at St. Paul's, outside the walls of Rome, were presented by Mahomed Ali. This Arragonite marble is produced chiefly by the lime-water droppings from the roofs of caves forming stalactite and stalagmite. A short time ago I visited some very interesting deposits in Trazos Montes, Portugal; one very large cave had a floor thickness of some 6ft., with hundreds of stalactites actually extended until they were engaged to the floor mass, forming a labyrinth of natural columns, and other caves had become completely filled up, so that blocks of very large size could be extracted quite sound. Last year also was discovered at Amiato the quarries that supplied Rome, Sienna, and Naples with the brown, yellow, and honey varieties. The colouring of these marbles is usually iron in solution. Beautiful as the Mexican varieties of onyx are, they are rarely successful when used in architecture for wall surfaces or mouldings. For articles of *virtu*, as room embellishments with ormolu, as used by the French, they are a decided success. In the yellow and brown variety, less translucent, as seen in the Paris Opera House, which is from Algiers, there is not the same difficulty in using.

SERPENTINES.

The serpentine marbles, of which we have extensive and massive rocks at the Lizard, in Cornwall, and Banff, in Scotland, although beautiful, have never proved of much architectural value, chiefly owing to the thin veins of steatite containing iron pyrites, which expand when exposed, and cause the work to split up. It was used considerably 30 years ago in Gothic work, and several good fonts were made. There is no doubt the broader and simpler the material can be treated the better. The French would seem to have been more successful than we have with this our own material, as there is in Paris an important front near the Place de l'Opera, which is certainly very good and is standing well. The massive architraves to the doorways of the Old Museum in Berlin, by Schinkel, are made in a grey-green serpentine, very dark in colour. These large doorways are grand and impressive, and are practically a copy on an enlarged scale of the Erectheum at Athens. France is very rich in coloured marbles. The most important are those of Sarrancolin, the reds of Cannes, near Carcassoune, the yellows of the Jura and Du Var; the Roman quarry of Bianco, Nero Antico, which is a brescia in black and white; the mottled reds and green of Campan, and the green of Maurin. There is a complete series of 700 cubes in the National School of Public Works in Paris. Algeria is famous for rich reds. Those of Oran (the so-called Numidian marbles of Playfair) and Chennoua are the best; the latter were used in our National Gallery. Spain has also grand marbles. A good collection of these, which number about 250, will be found in the Mineralogical Museum of Madrid. Portugal has famous quarries of rose colour near Cintra.

BRITISH MARBLES.

You are all familiar with our beautiful Devonshire red and grey marbles, of which there is a considerable variety, many of which are sound and good, and far superior to the Belgian reds, but owing to heavy railway rates cannot compete at all in price. The same remark applies to the Derbyshire and Staffordshire ones, which have almost gone out of use. This is sad, when we consider the first marble mills in this country were those of Ashford, near Bakewell. Ireland has good marbles, too. The Connemara green is unique, the Cork reds are good, and the black is excellent; but still the carriage and bad quarrying beat them. The fact is that more beautiful foreign marbles, owing to water carriage, can be got into London for as little or less cost than our own. It is pleasing to know that England has always held her own in marble work. I do not think anything can be found better done or more difficult than our old Purbeck, in Early English and Early Decorated work. You will call to mind Westminster Abbey (with its Chapter-house and tombs), the Temple Church, Salisbury and Lichfield Cathedrals, and Royal Tomb of Edward II. at Gloucester, the Shrine of St. Alban, the Grey Monument at York, and the elaborate bishop's tomb at Rochester.

ALABASTER.

We have in Derbyshire extensive deposits of a beautiful decorative stone, that is used largely for interior work, and which comes in cost between marble and stone. I mean the sulphate of lime, alabaster. This must not be confounded with Oriental alabaster, which is a carbonate of lime, and hard, while our English alabaster is comparatively soft, but tough, and takes a good polish. The voussoirs in and out of Tutbury Church, Derbyshire, are of the Norman period. For monumental work it has been used since the thirteenth century, and during the Decorated and Perpendicular periods it became the material most used for effigies and altar tombs, most of which are very beautiful; but the grandest period for its use was the English Renaissance. The important monuments erected in this style are artistic productions with an individuality of which we have reason to be proud. Just look at the examples in Westminster Abbey; their delicate and bold mouldings in contrast, the alabaster with a dull polish, only sufficient to show the colour; their inscription slabs and columns of black marble, the whole effect heightened and brought together by judicious use of colour and gold; further, to perfect their colour scheme, they sometimes diapered their black shafts with delicate surface work. Their inscriptions were cut with a flat ground, not V-shaped; the result is they are readable at any angle. In the modern finish and polish of alabaster, my conviction is that in intricate and delicately moulded work, with carvings and sculpture,

GLASS POLISH IS A MISTAKE.

And as alabaster is used instead of marble on account of cheapness, if we leave out the polish, we further reduce the cost. Nothing looks worse than some parts polished and others not. Sooner than polish carvings, do as the Mediæval men did, gild them. In Rouen Cathedral is a splendid monument of the time of Francis I., executed in English alabaster. In the North of Spain, near Bourgos, we find grand monuments, made in a delicately yellow-tinted alabaster nearly as hard as marble. The old workings would appear to be lost. I have spent much time in trying to find them, without success, although I found an inferior variety something similar. I put the Geological Society of Spain on the quest for this alabaster, but without success. Alabaster is an excellent material for lining the walls of hospitals, as it is non-absorbent, and is not affected by acids. It contains about 50 per cent. of water, and is so hydrated that it will not absorb any more liquid; but if heated to over 200° Fahr., it parts with its water and turns to plaster of Paris, so it is not suitable for chimney-piece work next the fire. Most of the imitation marbles that periodically appear are alabaster baked, which will then absorb any fluid colour you like to apply. The Italian statuettes we see so much about are often only white translucent alabaster of Voltera, which is boiled, producing an effect similar to statuary marble.

GRANITES.

These, of course, are not properly marbles, but as decorative materials they deserve a mention. A very important industry that has made immense progress the last thirty years is that of granite work. The Scotch of Aberdeen are entitled to the credit of this revival, which may be accounted for by the superior quality of their granites, their greys, reds, and rose colour being excellent. The amount they do in monumental work alone is enormous, immense quantities of which go to America. The last few years has made us acquainted with the beautiful granites and labradorites of Norway and Sweden. These the Aberdeen workers import in rough block. It is only of late years that granite could be sawn economically. This is now done by the aid of chilled iron shot or crushed steel, which are American inventions; and lately they have given us another still harder material—carborundum. This, which is made at Niagara, is next to the diamond in hardness; but it appears to lack toughness, as it soon crushes up into mud. There has been used within the last few years in our street buildings a large amount of polished granite work, and when it is broadly detailed and kept to one tone of colour it looks well. But I do not think we should like to see Waterloo Bridge and the Embankment polished, and certainly polished cemetery work generally looks very hard and uninteresting, while all monuments run on Celtic lines are ruined whenever polished, and nothing can be worse than trying to get effect by cutting off the polish to produce a pattern. Of all decorative architectural stones ever discovered, none has yet been found to surpass the Imperial Egyptian porphyry of the Romans; its purple colour is unique, which colour it will retain for ages unimpaired; it is rich, but not gaudy, and is one of the chief colour glories of the churches of Rome. What would Henry III.'s tomb in Westminster Abbey look like if the porphyry slabs were removed? Porphyry columns are the chief glory of St. Sophia in Constantinople; and it is so appreciated by every custodian of an Italian church, that if he has only a fragment he is sure to show it you. The old quarries of Mons Porphrities are only about twenty miles off the entrance to the Gulf of Suez. There is an inexhaustible quantity of the choicest material remaining, and through the Suez Canal it can now be got to Europe at a very reasonable cost, and with improved methods of working might be available to us for structural decoration, the same as it was with the Romans. The only thing wanted to achieve this is twenty-five miles of tramway; the gradient is 1 in 8 all the way down from the quarries to the sea.

MUSEUMS.

A very complete collection of the marbles of the United Kingdom will be found in the Museum of Practical Geology, also in the Natural History Museum. Foreign as well as British specimens are fairly collated. Then, again, in the British and South Kensington Museums many interesting pedestals and works of art in coloured marble may be seen, also good examples of Roman pavements. In the University Museum of Oxford is the famous Corsi collection, consisting of 1,000 specimens; these, I am delighted to say, have now fallen into the keeping of Professor Miles, who has had them placed in a good light. Many at present are in drawers, but he will be pleased to show them to anybody interested. There are two similar collections to the Corsi, made by Signor Belli; one in the Musée du Parc, Brussels, the other, very inaccessibly placed, at the University Museum in Rome. The Museums of Edinburgh and Dublin have each a fine collection, chiefly British.

POLISH ON MARBLES.

Labour with the Classic Greeks was of little consideration, as they certainly finished their works regardless of cost, but their white marbles in architecture they never polished (except the joints where it could not be seen); everything was left from the tool. There were no bright shining surfaces to reflect and injure the form. Polish you do not see anywhere on the Acropolis of Athens, and in the hundreds of beautifully sculptured stelè of the museums of Athens, London, Paris, and Berlin you find nothing but tool finish. For London and English towns, with our smoke and grime, we may require a finished surface that dust will not cling to; but I do not think bright polish helps us very much, for we all know how dirt will even cling to the surface of glass. The examples before you show Pentelicus marble polished, dull-polished, and tooled. The dull egg-shell polish I think you will prefer. Coloured marbles, to bring out their beauty, have to be polished, but even in these glass polish has sometimes a glarish look.

MARBLE PAVEMENTS.

The pavements of the Egyptians and Classic Greeks were close-jointed, thick slab blocks. Later the Greeks produced a few examples of tesselated mosaic. But the most important pavement period was undoubtedly that of the Romans, which in the beginning of the empire was a continuance of Greek designs and methods, most likely executed by Greek artists and workmen. The universal system soon became throughout Rome and her extensive colonies that of tesselated mosaic, which they executed in such a way that has never been done since. Just call to mind the infinite variety of design seen in these pavements: many are figure subjects, heads, and every description of animated life, from fish of all sorts, swimming in the waters, shell-fish, and nets on the beach, animals of all types in quick motion and passant, grouped and posed naturally and artistically, that few artists even now can equal. In addition to all this animated drawing, tree foliage was treated freely, growing, full of life, but adapted in the ablest of design to its purpose; plants of all sorts were grouped and conventionalised, to fit their position. Leaves and flowers were arranged as circling wreaths, others as borders, straight and curved, of fret and guilloche, interlacing round circles and angular forms, with the greatest of ease and freedom. All we now know and can do by the aid of reference help, the Romans knew in the third century. They also understood how to execute durable work by having a good, proper foundation, and using tessera three times as deep as ours, making that much firmer key. How little we know about the artists and art workers of these Roman tessera pavements! It would appear that with every Roman legion there must have been a corps of sappers and miners, as they practically found everything in the way of useful rock and mineral veins, which they worked on scientific methods. They, further, must have had a sort of artists' corps, consisting of art designers and workers, or these art pavements never could have been produced. We may further ask what became of the art in this and other colonies when the Roman occupation ceased? It would appear to have departed with them, as the pavements which had been universal now became obsolete. The art never went quite out in Italy, as the Popes were always caring for old pavements in way of removing and repairing, and at Venice the enamel mosaics of Murano kept the art alive. The modern revival we have to thank the French for in the building of their Opera-house at Paris, and the importation of Venetian workmen to carry out their designs. From France the art came here, and soon spread throughout Europe and America. For these pavements a good concrete foundation is absolutely requisite, and it ought to have time to dry out. The method of sticking the tessera on a paper cartoon, which is turned over and rolled or beaten into the coating of lime plaster, and afterwards rubbed down with soft grits, is familiar to you all. When large slabs of colour are introduced to get contrast, it is requisite to insert a dummy slab of common stone while the beating of the tessera is being done. The dummy slab is then broken up to get it out; this does not disturb the bedded tessera. Wood will not do, as it swells with the wet. The Romans sometimes used tessera of 1in. square, covering large areas with one colour only, red or green porphyry, or Giallo Antico. The effect is very imposing when enhanced with a flowing border of great width, as seen in the Baths of Carracalla. These 1in. tessera of marble in black and white in an endless variety of patterns with good wide joints are used for the steeet pavements and public squares of Lisbon, and answer well, as the city is very hilly.

SECTILE.

The sectile or slab pavement, arranged in different patterns of marble and porphyry, is very effective. There are examples in Rome on the Palatine, the Basilica of Julia, and the Pantheon. I think the simplest are the best. These are large slabs of rich marble, opened out with only a border slab of another colour round, such as large slabs of Pavonazetto, opened out with simple borders of yellow statuary. Also Pavonazetto slabs, with St. Ambrozio Verona for border, are safe and indeed a success. Carystian Cippolino so treated, with Verde Antico bands, makes a rich but retiring pavement. Pavements of marble squares, black and white, have been used in England since the 16th century, if not earlier. They are bright and clean, very durable, and not costly. Red and white is also good, but I prefer the black not polished, which is a soft grey black. These now have in a great measure superseded encaustic tiles. The Opus Alexandrinum pavements which abound in Rome, and an example of which we have in Westminster Abbey, are geometrical patterns made with porphyrys and marbles, the grand effect being produced by the "values" obtained by large circular slabs in contrast with delicate pattern work. The large circles are section slabs of Egyptian porphyry columns; the smaller circles are usually green porphyry of Laconia, which is never obtainable in big sizes. The grand pavement under the centre dome of St. Mark's, Venice, which consists of 12 Carystian slabs, making a square 30ft. by 26ft., with a rich mosaic border all round—you will all remember the Ruskin-Street controversy as to its irregularity—is now levelled and done up; and not this alone, but most of the pavements in the church, and nearly all the grand ones which are the glory of Rome, have been all made "brand new" the last few years. Another sort of pavement, very effective, are the Florentine ones of the Baptistery and San Miniato; they are foliage and figure pattern, inlays of black-green Verde de Prato into white. The subject is always the white slab. The same treatment is applied to the wonderful figure-subject pavement of Siena Cathedral. In designing marble pavements use as few colours as possible, and put the work on a good foundation. The Italians and French during and since the Renaissance period have used marbles and porphyries in various ways for furniture and objects of virtu. Many of the Florentine and Milanese tables are real works of art and costly productions. They further introduced marble plaques into ebony cabinets, which are still sought after by collectors. The various French works in marble and ormolu, especially of the Empire period, are generally refined and good. Much of this class of work made by the Chinese and Japanese is also very good and suggestive. Many things bought as "antiques" in the Jones Collection are modern, but are very good of their class.

MONUMENTS.

From the time of the Early Egyptians down to the present, the best materials obtainable have been employed for memorials to the dead. With the Egyptians no stone was too hard or too difficult to work. The Greeks chiefly used marble, and all who have had the pleasure of studying their monuments in the museum of Athens cannot help being impressed with their simplicity and beauty. Each one tells its own tale at a glance, without attempting to decipher the short inscription. Architecturally, there is a great variety. The "Stelè" have mostly a flat pediment to throw off the rain, with simple mouldings; the profile sections are flattened on the face; the sides invariably taper; the simpler have a relief panel of two or three figures, showing the farewell shaking of hands, with often the faithful dog looking on; nothing can be more pathetic. The more important have sculptured figures in high relief, often two thirds life-size. The sculpture comes boldly in front of the side pilasters. The whole thing gives the idea of the design and excution being by the same artist. I do *not* think they are "Art and Craft" productions. We are much indebted to Dr. Murray, of the British Museum, for bringing out of the basement and dark stores an interesting collection of these monuments. He has placed them in a good light, in a separate room, at the end of the Parthenon Gallery. South Kensington has some good casts, which might, for educational purposes, be added to with advantage. The Greek sarcophagi were always refined, and are well worth study. The museums have usually obtained those that are filled with sculpture, but simply moulded ones, like the one at Gergenti show, I think, better the Greeks' skill in subtlety of detail. The Romans at the first worked on Greek lines, but later got into a bold and refined type of work, especially in their sarcophagi and altar form of monument. But, like the Greeks, their small sarcophagi, and urns for funeral ashes, are of great variety, beautiful in form, and, as marble work, exquisitely wrought. The British and Sir John Soane's Museums contain excellent collections. The Byzantines made sarcophagi of enormous dimensions in porphyry and Verde Antico. They were large enough to take the deceased in full robes; the designes were simple in detail to suit the coloured material. The Verona tombs of the Scaligers of later date are much on the same Etruscan lines.

CHRISTIAN MONUMENTS.

How interesting most of the cathedrals and old churches of this country and the Continent are owing to the Christian monuments they contain! Many of these buildings are real museums, the monuments giving the history, national, parochial, and architectural. Unfortunately, owing to church restoration, we have lost many, while others have been skied where they cannot be seen. The want in many of our cold-looking church interiors is colour. This could be very much helped by coloured marble monuments. How cold most of the white monuments in St. Paul's Cathedral look, many of which are very costly, but how little they add in way of colour! Contrast the sculptured ones with the Parthenon sculptures, that we now know had colour patterns on them, or the beautiful works of Donatello and others in Italy, where gold and delicate colour are freely used. But we need not go abroad for colour precedent, when all our grand monuments in Westminster Abbey, from Henry III. down to James I., are full of colour. We have no modern work to compare with the Countess of Richmond's monument by Torrigiano. For modern work in sculpture, Rosso Antico, Giallo Antico, and black produce good work, especially for reliefs. The Romans and Florentines have left us numerous examples in most coloured marbles. There ought to be an effort made to get back memorials into our churches, for it is sad to know that a person who has been a constant worshipper in a church, has taken interest in parish affairs, and done good in various ways, should at his decease have no simple record placed to his memory in his church. He is buried in some distant cemetery amongst thousands of others who have piled over them masses of marble or granite void of merit in design. The friends of the deceased feel bound to erect what they call an imposing monument, or it will never be noticed. Now, would it not be better, instead of placing a costly pile in the cemetery (where it is frequently not seen until the next interment), to erect over the grave a simple record in durable material and place on the church walls a small, but artistic, monument—I say small, because the church walls can only hold a certain number? If the memorial is to a man entitled to arms, then give him his arms and a short inscription; or it may be a small panel of sculpture, portrait, or anything appropriate with colour. By this means we enrich the church and record the deceased; but little can be done until the clergy can fully appreciate its importance; and if they give permission—not, say, to the artist—it must be in this style or that to suit the church or match a poor one already there. If the parsons could be persuaded that they know nothing about architecture it would often be much better for their churches.

JOINTING.

Masonry jointing for built work is the proper method, but when marble has to be applied to iron construction, as covering of stanchions and girders, then special methods have to be adopted for the occasion, the things to guard against being expansion and vibration. In wall surfacing with marble slabs, vertical angle joints with a mitre ¼in. square check answer very well; and in strongly-marked marble mouldings going round a tablet, or even small opening, the ordinary picture-frame mitre is the best for effect. In the fixing of slab work it is best to leave a small open space at the back, and use bronze clamps with a projecting notch to prevent the slabs being knocked inwards. In the jointing of chimneypiece work, heat expansion and contraction in some cases have to be provided for. I find by recent experiments, when a piece of marble 1ft. in length is heated up to 230° Fahr. it expands about one-thirtieth of an inch, at 300° Fahr. one-sixteenth, and up to red heat one-eighth, but in each case on cooling it only contracts half of the expansion. I have made two experiments with white marble, and find that a piece of marble 4ft. long expands, when nearly red hot, five-sixteenths of an inch, but on cooling it only goes back half of the expansion.

CHIMNEYPIECES.

For skill in chimneypiece construction we must go back to early Monastic times. These builders found out that a long lintel in one stone could not resist breaking when over their large wood fires. To obviate this they jointed their "heads," using some form or other of wavy or stepped joint. And when marble is similarly exposed to a great heat this is the only safe method of jointing. North Italy, in the provinces embracing the cities of Genoa, Florence, Venice, and Milan, was the country for early chimneypieces, dating from 1400 to 1600. Venice, owing to its local building material, being Istrian or Verona marbles, "was always a marble-working city"; in addition to these they brought from Greece, along with their coloured columns, blocks of white. Istrian stone or marble, which is hard and receives the most delicate chisellings, was the favourite material. The designs, which are Renaissance, mostly consist of fine rectangular projecting canopies with architrave, frieze, and cornice supported by corbels well built into the wall, under which are pilasters or ornamental columns with caps and bases. Most of the chimneypieces are beautiful in design and well executed. The "antique-mongers" of Florence and Venice have grabbed them whenever they had a chance, and they copy and make "new-old" ones to the fullest extent by staining and smoking over wood-shaving fires until it will almost defy any expert to say if it is new or old. So I advise you, when buying these chimneypieces, to purchase them on their merit, and not as antiquities; then you are safe. Belgium, which is a marble country, has produced many good canopied chimneypieces. The most famous is the grand one in black marble at Bruges. France is perhaps, the richest country for good chimneypieces in every style and date. They are found in every old palace, château, and castle; there is a series of simple but most delightful ones in the rooms of the Louvre in Paris, one in Egyptian porphyry, another in lapis lazuli, another in Rosso Antico, and so on. These have ormolu mouldings. The refined Adam's ones take a lot of beating, either in design, execution, or economy of good material. The original drawings of many of these are in the Soane Museum. A bold ovolo moulding in coloured marble all round the fireplace opening is always safe. In conclusion, I will say, use as few colours as possible in your work, and the nearer you keep to one the better.

Dr. Alexander S. Murray, Keeper of the Greek and Roman Antiquities at the British Museum, remarked that the impression left on his mind after hearing Mr. Brindley's instructive paper and seeing the splendid display of marbles and building stones that evening, was that Mr. Brindley must have seen and rediscovered everything that was worth finding out. He had met the lecturer in the Egyptian Desert, in Greece, and in many parts of Europe. One thing he could hardly bring himself to forgive Mr. Brindley for: some few years since, when they decided to replace the packing-cases around the Parthenon sculptures at the British Museum with more suitable surroundings, he consulted Mr. Brindley as to whether it was not possible to obtain a Cippolini marble from the vicinity of the Athenian quarries as bases, and he replied that it could not be done. On his advice, another and very quiet foundation was provided for the marbles, and now that evening they found Mr. Brindley could at the present time have given the very material they had asked for. As to the yellow tinge acquired by the Athenian marbles, Mr. Brindley had attributed it to the sunlight acting upon an iron deposit in the stone; but there was another, and perhaps more tenable, explanation recently put forward by a young American student. This student had swung himself all round the Parthenon frieze, and had examined the sculptures and architecture minutely. He asserted that there were evidences that the whole fabric was originally coated with a thin size containing crushed marble, which not only took the rawness off the appearance of the building, but had enabled the painters to work with great rapidity. This coating was best seen in the hollows of the draperies, which had not been exposed to light; but it was very probable that the size contained some solution of iron.

Mr. A. T. Bolton described some mosaic paving in Rome, Venice, Ravenna, and other parts of Italy, and remarked that in Italian mosaic work it was noteworthy that the earlier work was freer and more conventional, and thus better suited its purpose than that of the later period. All attempts at elaborate details, shading, and perspective were to be deprecated. Marble was a costly material, and it was well not to use it too lavishly, lest the effect should be that of a fishmonger's shop. The lecture would have been still more valuable and instructive if Mr. Brindley had suggested to architects what principles ought to guide them in designing works to be carried out in marble.

Mr. Andrew Oliver asked whether any ancient tools were found in the Egyptian quarries, and, if so, whether they were of steel or bronze.

Mr. Matt. Garbutt inquired of Mr. Brindley if he could recommend any marble that would stand in external work in London. In most cases the surface soon perished, and it had to be periodically repolished. Further, was there any means of protecting slabs of the material from risk of injury from damp percolating through the wall behind? Would bronze frames inclosing the marble, and, of course, concealed from view, be effectual preservatives? So far as could be ascertained there was little risk of injury of marble in England by expansion and contraction except in fireplaces, where a vertical joint should be provided and play given to the material.

The President, in putting the vote of thanks, said he agreed with Mr. Bolton that mosaic designs should be simply geometrical in character. He had sympathy with the author's desire to bring back more colour into our churches, but did not coincide in his plea for the maintenance of one tone of colour in a building. He asked why Mexican onyx was not more largely used for decorative purposes.

Mr. Brindley, in acknowledging the vote of thanks, which was carried by acclamation, said Mexican onyx was used very successfully in the Grand Magazine, Paris, where the panels were inclosed in a narrow line of red Giotte; but he did not regard its treatment at the Brompton Oratory as satisfactory. The colour of the material was so brilliant that it would destroy the effect of any pictures in a room, and, therefore, it should only be employed in small quantities, or for such places as vestibules He quite agreed in Mr. Murray's view that the Parthenon marbles must originally have been coloured, as was the case originally, of course, with the 13th and 14th century monuments in Westminster Abbey. In reply to Mr. Oliver, he might say that he had found no bronze tools in Roman quarries of porphyry in Egypt; but he brought home an old steel saw which he found still sticking in the partly-cut marble, and also an iron plummet shaped like a fish, with a hole for the cord to run through it. Marbles which contained magnesium would retain their colour in London if exposed to the atmosphere, and those included Irish and verde antique. The acids with which the air was charged in many parts of the Metropolis were very troublesome, but porphyry was not affected by them. His experience showed that marbles could not be harmonised on a painter's pigment scale, and that it was necessary to try materials in position to avoid violent contrasts which were destructive of all breadth of effect. He should be delighted to welcome the members of the Association to his works in Westminster Bridge-road, and if they could arrange for a Saturday afternoon visit, he should be delighted to keep the machinery going, as he held that more could be learned in a few hours among the materials themselves than in hours listening to papers.

The President said the committee would take an early opportunity to organise a visit in acceptance of Mr. Brindley's kind invitation.

THE SURVEYORS' INSTITUTION.

THE first general meeting of the session of this society was held at 12, Great George-street, Westminster, on Thursday evening last, when an opening address was delivered by Mr. T. Miller Rickman, as President of the Institution. After congratulating the members on the handsome and commodious building in which the Institution was now housed, and mentioning, as an evidence of the intention of the Council to secure permanency, the fact that the new lease had nearly 1,000 years to run, and that every effort had been made to insure that the construction and materials were of the most enduring character, the President proceeded to deal with the subject of the profession of the surveyor as it presents itself to the public at large. Many persons had but a vague idea of what a surveyor was, except that he was a man whose advent generally presaged a new railway or a new street; and, again, there were many occupations, such as those of surveyors of shipping, surveyors of taxes, and others, which were very widely separated from the practice of the members of the Institution. This all led to confusion; but, after all, the term "surveyor" was simply a synonym for "supervisor" or "overseer," and indicated a man who, by a special knowledge, was enabled to advise and to control, where the general knowledge of ordinary men was at fault. A surveyor, to whatever class he belonged, had to do with the management of property, and it was this dealing with the interests of property, on which the stability of the nation so largely depends, which united the members of the Institution by one common bond. The older generation of surveyors, to which he belonged, were confronted at the outset of their career with difficulties of which the present race of surveyors knew nothing. They were without textbooks or formulated knowledge of any kind, but had to learn by the hard experience of facts and the penalties which attend upon mistakes or ignorance. The President then dealt with the examinations of the Institution, which he said were necessarily at the same time too long and exhausting for those not physically fit, and too short to afford a wholly satisfactory test of knowledge in such a wide range of subjects as these examinations necessarily embraced. Whether any change in the present system, such as a division of the higher examination into two stages—an intermediate and final—would be possible or advisable, he did not presume to say; but some such a change would seem to be indicated in order to meet the undoubted difficulties of the case. Some years ago a paper had been read at one of the early meetings of the Institution by a member who pleaded for "Culture in the Profession of a Surveyor," and it was of the essence of a surveyor's knowledge that it should be of a wider and more general, if less profound, character than is necessary in some of the more specialised professions. The institution of property and its security were the paramount fact in the life of a progressive community, and all the arts and all the sciences were its handmaidens, necessary for its creation, development, or enjoyment, or dependent on it for reward, and the knowledge of a surveyor who has to deal with property in all its various aspects should be almost encyclopædic. In order to obtain such a general wide acquaintance with all the thousand and one matters which may affect his practice, the motto of the surveyor should always be "Observe! observe! observe!" He must not regard anything as outside his range or beyond his capacity to understand, for he has to advise his fellow-men on matters which, more nearly than any others, touch their material interests, and he has special opportunities for acquiring information which lies beyond the reach of others. His own experience, extending over many years, enabled him to record his conviction that, taking the surveyor's profession as a whole, the status of its members had greatly improved during the last century. Turning to deal more directly with his own particular branch of practice—that of a building surveyor—the President commented on the changes which he had witnessed in methods of measurement, in constructive details, in the materials dealt with, and, above all, in the training and position of the workmen who gave visible form and substance to the surveyor's labours. Forty years ago the workman in the joiner's shop had to perform all the various operations with his own hands. Now these were done by machinery, and he was little else but a fitter and fixer. The old trade guilds, while they protected their crafts, also aimed towards perfecting their arts. It were to be wished that this dual purpose would animate our present workmen; but it was not merely the craftsman who had drifted away from his original relations to his work. The employer, in former days, who was about to undertake an important building, selected his artificers, used such materials as were ready to hand, and himself estimated the possibilities and difficulties of the work, on which he stamped his own individuality. Now a general contractor brought his machinery and his army of men, undertook the work on a purely commercial basis, made his carefully-calculated profit, and passed on to another "job." This was business—this was strict utilitarianism; but it was not favourable to the artistic development of any constructive craft. To all thinking persons engaged as building and measuring surveyors, the present state of the skilled labour market was a matter of some anxiety. In the important report of the sub-committee of the Technical Education Board of the London County Council, it was made clear that the only nursery of the London building artisan was the country workshop. Among 41 typical London building firms, employing some 12,000 hands, there were only 80 apprentices and 143 "learners," instead of about 1,600, which would be the normal proportion. The men laid the blame on the masters, who, they said, refused to be troubled with apprentices, while many masters accused the men's unions of intentionally restricting the number of trained workmen. The tendency had, of course, been of late towards the absorption or extinction of the small masters, and a consequent increase in the use of labour-saving machinery, and an indifference among the large contractors as to where their skilled labour came from. The men had undoubtedly wished to restrict the amount of competition in the market to which they brought their skill; but this was a tendency very clearly visible in all trades and professions. In certain trades the unregulated efforts to restrict the number of workers had merely resulted in stimulating the invention of labour-saving machinery to satisfy the demands of an impatient public, waiting to be served. The joiner had, as he had said, become a mere fitter and fixer, and the plasterer had, by his action, called into being numerous substitutes for his decorative work. Although it was often said that as good as ever was obtainable if it were paid for, he could not but think that the general standard of work had deteriorated with the decline of the apprenticeship system. The technical schools, the classes for arts and crafts, and other public or semi-public efforts of the kind had been in some quarters looked upon as a remedy for this; but these institutions were regarded with jealousy by the unions as counteracting their policy of restriction of labour, and the boards governing them betrayed a nervous fear of incurring the active hostility of the unions. To look upon such technical classes as a recruiting ground for the skilled labour market was, he felt, mere delusion and confusion of thought. It was simply endeavouring to do at one end what the unions were bent on undoing at the other. The solution of the difficulty must come from an intelligent appreciation of the facts on the part of masters and men, and he believed he could see signs that, on both sides, there was a tendency to revert to something like the old system, under which trade lived and grew, and work improved in quality. He would conclude his address with an acknowledgment of his indebtedness for many of the facts he had been able to lay before them to the secretary of the Institution.

A vote of thanks to Mr. Rickman having been proposed by Sir J. F. L. Rolleston, and seconded by Mr. J. H. Sabin, and carried by acclamation, the meeting then adjourned.

CONFERENCE OF MASTER PLUMBERS.

THE half-yearly conference of the National Association of Master Plumbers was held on Wednesday in last week at the Hotel Metropole, Leeds. About 150 delegates attended from various parts of the country, and the chair was taken by the president, Mr. John Skirrow, of Leeds, who was supported by the following vice-presidents:—Messrs. W. H. Smith (Hull), W. H. Mallender (Derby), J. Osborn (Birmingham), R. W. Cooke (Newcastle), and W. Jaffrey (Manchester).

Mr. H. Lindley (vice-president of the Leeds Association), in offering a cordial welcome to the visitors, reminded them that Leeds was the birthplace of the National Association.

Mr. W. H. Smith (the senior vice-president) briefly responded.

The honorary secretary (Mr. J. Beal, Hull), in giving his report for the past six months, said it was gratifying to note that the association continued to meet with a large measure of success. The builders' question seemed to be pressing very keenly upon them just now. In some of the towns they had visited this question had done more towards hindering a thorough organisation of the plumbing forces than any other element. He believed that the main object of their friends in trying to get hold of the master plumbers was to further the interests of their own organisation, and the effect of this was that they found it very difficult to form themselves into purely master plumbers' associations. In some towns the master builders had passed a resolution not to accept tenders from any person unless he belonged to the Master Builders' Association. If the master plumbers would only join their own organisation, and resist the efforts of the master builders to entice them away, he was confident that they would find it decidedly to their advantage to do so. The honorary treasurer (Mr. A. B. Dyson, Halifax) in presenting the financial statement, reported an increase of 70 members during the half-year. The account showed a balance in hand of £59 18s. 3d. The vice-presidents' reports followed.

The president, in his address, stated that the conciliation board had met three times during the past half-year—at Hull, Stockport, and Oldham respectively. At their Stockport meeting they settled all matters in dispute, to the entire satisfaction of both the employers and the employés. At Hull and Oldham they were not so successful. Since their last meeting at Wolverhampton, their organising officer, Mr. A. E. Biggs, had found it impossible to continue in office on account of ill-health, and had tendered his resignation. He would like to call their attention to the position with regard to firms doing patent glazing on buildings that master plumbers were employed upon. In most cases the item of patent glazing was included in the plumber's quantities as a provisional sum, and after taking all the trouble and risk they sometimes found that the firms who had done the work were disinclined to allow the plumber any discount when he discharged the account, often stating that they had quoted to the architect or the builder the same price as to the plumber, which was a very unfair way of doing business. The executive had had this question before them, and were trying to get the patentees to either meet them in conference, or agree to allow a discount of, say, from 5 to 10 per cent. of the prices submitted to either builder or architect. Alluding to the relationship existing between the Master Plumbers' Association and the Master Builders' Associations, both local and national, Mr. Skirrow said it was not so satisfactory as it might be. As most of them knew, the building trade, especially in Yorkshire, had been in a most unsettled state during the whole of the past summer. At their annual meeting in Wolverhampton, in May, they passed a resolution not to lock out any of their men—a step which subsequently put them in a very awkward position. They found that they could neither obey the orders of the Builders' Federation, to which they belonged, nor the instructions of the Wolverhampton meeting, and they decided to resign their membership of the former until some better scheme was formulated. His own idea of federation was that each branch of the building trade should have its own national association, and that a council or standing committee should be elected from the executive of each association in equal representation.

It was unanimously resolved that the next meeting of the central board should be held in Manchester, and that the annual conference for 1900 should take place in Liverpool.

Mr. Osborn submitted a scheme drafted by the Birmingham association for insuring members of the national body against liability in respect of legal claims. After some discussion, it was decided that the matter should be left in the hands of the Birmingham committee and the executive committee for further development.

A long discussion followed with regard to organisation, and a scheme introduced by Mr. J. Butterworth, of Oldham, was referred to the executive committee for consideration.

The proceedings concluded with the presentation of testimonials to Mr. J. Beal, Mr. W. H. Smith, and Mr. Harrison, all of Hull, in recognition of past services. Mr. Beal, who was the first president of the association, a position he occupied for three years in succession, received a gold watch, with a gold ring for Mrs Beal. Mr. Smith, who, during Mr. Beal's presidency, officiated as joint hon. secretary with Mr. Harrison, also received a gold watch, with a gold ring for Mrs. Smith; and Mr. Harrison received a tea and coffee service. An illuminated address accompanied each of the gifts.

In the evening a smoking-concert, arranged by the Leeds members, took place.

SCHOOL BOARD EXHIBITION.

THE annual exhibition of the School Board for London is one of the largest displays ever held of the manual work done in the schools of the Metropolis, and the works are on view at the Examination Hall, on the Victoria Embankment. Nearly all the schools are represented, and the exhibits include the work done by the Evening Continuation schools, those for the deaf and blind, &c. We can only remark here the superior quality of the work done by children who attend these schools. Taking the drawings from nature and from the cast, they show a great advance on the earlier efforts, the advantages of a system of instruction; the drawings of plant form, of outlines and shaded copies from the cast, in sepia and chalk, are very creditable. We see the first prize, for a group of an earthenware pot and orange, is given to Walter Overthrow—very true in drawing and colour. The drapery studies from the fabric, and the designs for painted vases, panels, stencilled patterns, tiles, table-covers, &c., show inventive skill of a high order. The exercises in "brushwork," in which the leading lines of patterns are drawn by the brush, are excellent. This method of study is a favourite one in our art schools, and is well adapted to give free expression to ornament. The adopted designs show several clever examples for filling spaces.

The relief modelling designs in plaster, &c., are equally good, many of the designs for panels and hand-mirrors, door-lock plates, friezes, &c., exhibit a true spirit. Lastly, we must not overlook the wonderful collection of woodwork and carving, the numerous articles of inlaid work, chess and draught-boards, trays, racks, boxes, and fancy articles exhibiting a technical and manual skill; the metal-work; also the examples of dressmaking and needlework, cooking and laundry-work. From this collection various articles are to be selected for the forthcoming Paris Exhibition of next year. The free-arm drawing shown by the Burrage-grove School and the Goodrich-road School, East Dulwich, done by pupils of tender years, show the development of the art instinct by individual effort, especially the drawing and modelling in clay of flowers and other natural objects.

QUANTITY BIDS ON ARCHITECTURAL AND ENGINEERING CONTRACTS.

AT a recent meeting of the Technical Society of the Pacific Coast, Mr. G. A. Wright read a paper on the quantity system of inviting bids from contractors and its application to engineering and architectural practice. This system is the usual one in Great Britain, but not much used in America by architects, although engineers frequently employ it. The arguments in its favour are so clearly stated by Mr. Wright that they are reprinted nearly in full.

"It will be generally conceded that a correct estimate is an impossibility without correct quantities, therefore a bill of quantities should contain every item of labour and materials possessing a money value. When such a document is prepared at the expense of a client or owner, and guaranteed to be accurate, and a number of copies are issued to a corresponding number of contractors, upon which to make up bids, then we are following the method of estimating known as the quantity system, and I will briefly present to you the different phases of the subject as they appear to me. At the outset, I will say that I believe some such system would be an improvement upon our present methods. My own experience of quantities, it is true, has been confined largely to quantities for architectural work; still, having also prepared quantities for civil engineering works, I feel justified in coupling together the two sister professions, as I have done for my paper this evening.

"In the first place, in the preparation of quantities three distinct processes are involved:—First: taking off the measurements from the drawings, and the descriptions from the specifications. These are all entered on dimension sheets, every figure of which should be preserved for reference. Second: abstracting from the dimension sheets all the items and grouping them under their proper classifications. Third: drafting the bill and putting therein detailed marginal sketches necessary to show bidders exactly how every part of the work is to go together, which goes a long way in preventing subsequent disputes or misunderstandings. To perform even one of these operations as I think it should be performed calls for some training—indeed, the quantity surveyor is usually an engineer or an architect, and more time is certainly required than individual bidders get to-day for making up their figures; but there are advantages and results justifying the additional care and time spent. Indeed, the only reliable method is to carefully measure and describe every single item, guessing at nothing, and taking no chances.

"The bills of quantities (and which, for the sake of brevity, I will hereafter call the bills) being completed, are all placed at the same time in the hands of the bidders; ample time being allowed for pricing insures greater accuracy. Unsuccessful bidders retain their priced bills in their own possession, and if preserved for future reference, some excellent pointers can be accumulated about percentage, which are of service in compiling future bids. The successful bidder usually deposits in some place of safety a sealed copy of his priced quantities, and which (if it be necessary) at the proper stage of the work is used by mutual consent as a money basis for determining variation values, the quantities for same being ascertained at the completion of the work. Disputed claims are thus rendered uncommonly rare, thereby saving much time and annoyance to the contractor, and to the owner, and to the engineer or architect, as the case may be.

"In some European practice the courts recognise the necessities of quantities, and civil engineers or architects, having been authorised to obtain bids for work, are empowered to employ a qualified quantity surveyor to prepare the necessary bills for each trade, his fees being included in the sum total of each bid, and they are thus indirectly paid by the owner. Such is the course of procedure, sustained by law and equity, and fully endorsed by all the contractors' organisations.

"The first page or two of a bill usually contains brief extracts from the general conditions of contract—matters which cannot be measured; for example, use of plant, foreman's wages, insurance, watchman, interest on retention money, pumping allowances, testing materials (such as steel, brick, cement briquettes), and any matters outside of the actual construction.

"Then follow the various trades, commencing with excavator, and ending usually with painter. In every bill each item in every trade has, or should have, its proper place, the whole being uniform, and thoroughly systematised, and which in quantity work is indispensable. One or two illustrations will be sufficient. Taking excavator, each class of work is segregated; for example, surface scraping, then trenches for footings, or sewers under 5ft. deep, and a separate item for each additional 5ft. in depth. If shoring be necessary, I prefer to take the walling pieces, spreaders, &c., separately. Driving tunnels or headings should be kept separate, the sectional areas and depths being always given; the same in well-sinking, and where earth has to be basketed. But I need not elaborate further. It is always stated how far the excavated material is to be hauled or wheeled, and whether it is to be simply dumped or roughly spread or levelled, or sloped, or it may be seeded down for grass, as in fortification work. Everything affecting the cost must be noted, including the nature of the soil. Similar segregations would apply to tide work, ditch and harbour work, blasting, and other items which will suggest themselves to you, and whilst all may come under a similar classification, all are segregated according to their respective values.

"Passing on to brickwork, we find a preamble in a bill, which describes fully all the materials to be employed, the different kinds of bricks, the lime, sand, cement, method of mixing required, the facings, the pointings, &c. Then follow the quantities of each item, the quantity of brickwork, first in footings, then follow the walls of various thicknesses. I prefer to take the number of square feet of each different thickness, and give each separately. This gives a bidder a better idea of the scaffolding required and labour involved, and to some extent it may be well to designate where the different items occur in the structure. It is obvious that a 4in. wall is proportionately more expensive to build than a thick one, and footings and thick walls below ground cost less per thousand than the same volume of work above the roof line of a modern high building. In such cases I consider it more skilful to use separate prices than to lump everything together at so much per M.

"Facings, measured by the square foot, come next, the cheapest first. As an example, take a case where the best of the common bricks have to be selected for certain facework. It may seem a small matter, but in building construction it is the small matters which need watching;—every contractor knows that, and it costs money even to pick over a quantity of brick, if carefully done, and a surveyor would always give the quantity in his bill. Where such work occurs, it is necessary to give a superficial measurement for building walls and face work to a template or circular on plan, stating the radius, of course. If the sweep is so sharp as to require purposely-made headers and stretchers it would form another item. Hollow walls would, of course, be segregated, on account of the additional labour; the kind, weight, and number of wall ties must always be stated. Then there are many other superficial items given, such as cuttings, face arches, trimmer arches, centring, &c. After that follows the lineal items, such as copings, brick sills, water tables or plinths, moulded brick courses, belts, oversailing courses, moulded quoins, and next to these we get all the mitres, internal and external. These must not be overlooked. Brickmakers charge contractors extra rates for these, and bidders are entitled to know how many of them there are, and so the quantities tell him invariably.

"A glance at the stonemason's quantities, and I have finished with examples. The giving of the mere total cubic feet of cut stone does not fairly indicate the labour on same, and I am reminded that my friends in the stone business have told me before now when I have been measuring extra works, that the material itself did not amount to much—it is the labour, they say, that costs. True, and for that reason we should, I think, measure the labour as well as the stone, and not rely too much upon less accurate methods. In the quantity system this measuring of labour is frequently done in something like the following order:—First, the areas of all beds and joints are measured; the result is divided by two and called half-sawing. Stone-men know what sawing is worth on different kinds of stone, and it is a simple proposition to price the item, if the quantity is given; then the result is as near accuracy as anyone could desire. Now, exactly the same process can be applied to all other labours, some of them being as follows:—Plain work, as in ashlar; plain work sunk, as in a sunk panel; plain work sunk circular, as in the back of a niche; plain work circular circular, as in a ball or other sphere; then we have plain work sunk circular circular, as in the basin like portion of a font. And then we can take in all the moulded work on the same principle from the simplest form, up to moulded work sunk circular circular, represented by the moulding of a sunk panel on a sphere, and we go through the same process for each variety of stone, granite, or marble, &c.

"As to whether any improvement is necessary in our estimating methods, I feel personally that the question can be answered in the affirmative, and I will give one or two opinions which have come under my notice. An eastern architect, some three years ago, wrote an article for the professional Press entitled 'A Problem of Waste,' and considerable stress was laid by the author upon the waste of time incurred by bidders in figuring work. He described our method as reckless, unscientific, and unpracticable, and, I think, might have added unprofitable. About the same time there appeared in a San Francisco trade paper an objection to the waste of time involved, from a contractor who used even more forcible language than did the gentleman in the east. A well-known professor occupying the chair of architecture at an eastern college, in writing to me some time ago on this subject, said: 'I have been hoping for some time to see a modification of the European system of quantities introduced into this country;' and it is not an uncommon thing for me to hear contractors say 'they are about tired of figuring and getting little or nothing for it,' and I believe there are to-day many men ready to welcome a change which shall dispense with the continuous waste of time referred to. This feeling, I am led to believe, is stronger in the East to-day than it has ever been before. Only a day or two ago I received a letter from one of the largest contracting firms in New York City, in which they say:—'We fully concur in your view that on extensive work accurate lists of quantities should be furnished to contractors.'

"Under present conditions, an owner may decline to build at all, upon any pretence, and even the lowest bidder gets nothing for his time and trouble, an unfair proceeding entirely, whilst the owner does get what he desires above all things—to wit, the cost of his structure, or building, without expense, and without taking any chances; those, of course, are all to be assumed by the bidders, and under old-time methods of figuring the custom has, unfortunately, been handed down to us; but I believe that with the great change wrought in construction in recent years the estimating risks should now be borne equally by owner and bidder. If it were so, it would have a good effect upon a certain class of building speculators, who, knowing a bid will put them to no expense, do not hesitate to get figures and to reject them all, unless they can, or think they can, see a chance to get ahead of the contractor, and yet how many laymen there are who involuntarily thrust both hands into their pockets and keep them there when they are about to erect a building.

"But now let us see how the system would affect the engineer and the architect. In the first place, a shorter specification would suffice, for the bill (which should be part of the contract) would contain all requisite descriptions, and explanatory details, in the way of marginal sketches. Again, the close examination made in preparing such detailed quantities would disclose any little oversight or differences that may exist in either the specifications or drawings, and these could all be set right before the contractors received the documents, and the number of questions on such points would be reduced to a minimum. Again, the bill would be invaluable in helping to adjust changes on contracts, and much time and controversy would be saved during the progress of work. As inquiries arose, if any, they would usually be immediately settled by referring to the quantities.

"When improper work occurs, it is more likely to arise from the attempts of a certain class of contractor to recoup himself for having left something out, and where such a condition does exist, and a man sees he is going to lose money, the temptation is truly a strong one. But with the quantity system this could not arise from this cause, for all items would be in the bill, and could not be forgotten.

"One advantage to contractors would lie in the fact that they would, without a cent of expense to themselves, be saved an immense amount of figuring, which is to-day entirely unremunerative, and they need not wonder how much of the work their competitors will leave out, and so secure the contract. Relieved of the responsibility of figuring out the quantities, it would be a pleasure quickly performed to price each item, foot up the bill, and add the percentage, and with a reasonable prospect, too, of making such profit if the contract is obtained. Again, quantities protect the competent bidder, for the incompetent man, who sometimes gets in the lowest bid, does so on short quantities. More competent, and often times more responsible, men are thus handicapped, and some are tempted to cut prices to get even with the irresponsible, with the result, of course, that many a competition job, especially during the last five or six years, has been scarcely worth having, so far as profit was concerned.

"To fairly consider this subject, I want to present one or two objections to the quantity system which have been alleged. One is (and curiously enough it is the one mentioned most frequently) a quantity surveyor might favour a certain contractor. My answer to that is, that the professional and trade organisations should meet and authorise proper surveyors to act, and contractors can decline to figure on any quantities not prepared by such authorised surveyors. If any unprofessional conduct occurred, the offender could be easily detected and debarred from practice thereafter. The best safeguards however, would exist in making a proper selection in the first place. In other places the professional capital of a quantity surveyor lies solely in his known reputation for honesty and skill. It has been stated also that incompetent bidders would be benefited; but I don't think so, for the reasons previously stated. The best firms to-day do not usually get beaten in their prices, for can they not buy as cheaply as anyone? It is more often the mistakes of others which lose them a contract.

"A word or two about the practice in other countries. In Europe the principle of paying for engineering, as well as architectural, work by measurement largely prevails. In some parts of Scotland work is often carried out first and accurately measured afterwards, the prices being determined by a schedule previously agreed upon. The objection to this plan seems to me that an owner never knows just what he will have to pay until the work is finished, and I don't imagine that would be agreeable to many owners on this coast.

"In parts of France and Germany the principle of paying for work according to the measured quantity executed, or to be done, has found favour. In Ireland the quantity system is in vogue, as is also the case in England, where it has been adopted for forty or fifty years probably. I found the same conditions existing in 1891 in Melbourne, Australia, the most Americanised city in the world, probably, outside the United States. Just at that time the Melbourne sewage scheme was in hand, which was to cost some twenty million dollars, if I remember correctly, and I understood from the chief engineer that it would be contracted for on the measure and value principle. I also looked into the estimating conditions at Sydney, N.S.W., and at Adelaide, Western Australia, and estimating upon quantities was the general practice, and the only one favourably endorsed by contractors. Indeed I know of no locality in which the system has been adopted, where there is any desire to revert to less modern methods.

"It is a debatable question, perhaps, whether the quantities should or should not form part of the contract. It seems to me they should, so as to carry out the principles involved of a contractor doing so much work, and no more, for a certain sum of money. Our methods of taking bids and making up estimates differ so widely from that practised in some older communities, that the system I have outlined would necessarily have to be modified before it would be entirely suitable to our needs; but I anticipate there would be no difficulty in formulating a system agreeable to all.

RESERVOIR DAMS: STEEL VERSUS MASONRY.

It is not generally stated in treatises and text-books dealing with the design and construction of ordinary retaining-walls—that is, those which have to resist the pressure or, practically, the weight of so much earth or soil—that the conditions governing their equilibrium are, if not precisely the same, closely allied to those which regulate the form and proportions of reservoir walls and dams. In other words, the numerous equations and formulæ—and their name is legion—for the stability of retaining-walls, as already specified, will apply with equal force and accuracy to all descriptions of walls built for supporting the pressure of water. It is only necessary, in order to effect this desirable uniformity, to introduce two slight modifications, which will perhaps be best explained by the aid of a diagram. Let A B C D in Fig. 1 represent the cross-section of the usual type of a retaining-wall; put θ equal to the angle which the earth at the top of the wall makes with the horizontal, or, as it is commonly termed, the angle of slope; and ϕ for the angle of repose of the materials composing the wall, which differ very widely, as the following few examples will point out. For dry sand θ equals 37°, for coarse gravel or shingle 40°, for dry earth 48°, and for moist soil 55°. Referring back to our diagram, we adapt the formulæ applicable to ordinary retaining walls to those acting as the walls and dams of reservoirs by making

$$\theta = 0 \text{ and } \varphi = 0.$$

The first of these substitutions becomes valid, because, in the case of water-supporting walls, as elsewhere, the surface of still water is always horizontal; and, therefore, θ, the angle of slope, vanishes. Again, we make $\varphi = 0$, because it is always assumed, and in this instance the assumption is correct, that no friction takes place between aqueous molecules, since they are at perfect liberty to move freely in any direction among themselves. Consequensly, φ, the angle of repose, becomes equal to zero.

Until very recently reservoir walls and dams were constructed of timber, earth, masonry, concrete, or sometimes two more of these materials combined in different ways. It is not our intention at present to enter into the merits of these different types of walls and dams, but to rather direct the attention of our readers to the new competitor which has just entered the field, and which, it is quite possible, has come to stay. The new candidate for constructive employment is steel, and it must be admitted that its field of utility and service is daily augmenting. It will also be conceded that the character of the structures to which it has been newly applied is assuming a greater degree of prominence than has previously been attached to them. We are proceeding now more than ever to call into play those great forces which Nature has so long unheeded placed at our command. We are now impounding the great Niagara, and numerous other powerful sources of motive action; and wherever the impounding and storing of water is concerned the subject of our present article comes strongly to the front. Reservoir walls and dams are as essential to the utilisation of water-power as heat is to the production of steam.

There are several very important points in which a steel dam differs from its prototype of masonry, and it will be sufficient for our present purpose to limit our comparison to these two classes of structures. However well a dam of stone may be designed and built, it possesses many well-known disadvantages and defects which require very careful attention and strict supervision to effectually guard against. A stone dam is, in fact, a simple wall, founded at a certain depth below the natural surface of the site, and well and properly bonded together in all directions to insure its permanency and stability. It has, however, a weakness which is common to every description of wall, great and small, and that is the tendency, which increases with its age, to crack and become more or less fissured and self-disintegrated. This is a very serious and dangerous fault, for in some instances it is almost impossible to either foresee it or make any provision to counteract it. The failure of the great Boozey dam in France—and, in fact, of nearly all similar engineering works—has always been of a terribly sudden and calamitous character. Without a moment's notice, the dam gives way, the irresistible waters rush through the breach, and the whole country for miles is desolated and ravaged, with a lamentable sacrifice of human and animal life. It is not to be wondered at, therefore, that, under these circumstances, the attention of hydraulic engineers should have been directed towards finding some substitute for masonry and concrete, which would enable dams to be built free from the defects which are well-nigh inseparable from them when constructed of either of those two materials.

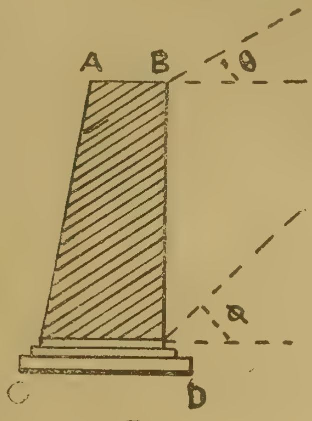


FIG. 1.

The modern material which would suggest itself as the one best fitted to cope with the emergency is unquestionably steel. Its great resistance to tensile stress and its superior toughness are strong safeguards against splitting or fissuring, and there is no difficulty in framing it, and in building it up in any form that might be desired. This idea has taken a practical form in America, where a dam has been constructed for the first time solely of steel, and marks a distinctly fresh departure in this type of engineering structure. It is a bold, original, and ingenious piece of work, carried across a valley and forming a reservoir capable of containing 5,760,000c.ft. of water. A brief description of the manner in which it is put together will enable any one conversant with the section of an ordinary retaining wall, as shown in the accompanying cut, to readily understand the mode of framing adopted. The faces of nearly all retaining walls are built with a pretty stiff slope, or "batter," as it is technically termed, and this is formed in the example before us by placing a series of the steel joists constituting the front framing of the dam at an angle of 45°, and strongly tying and strutting them with both longitudinal and transverse bracing. As a basis and support for these inclined joists or rafters, solid pillars of masonry are sunk until they reach a firm foundation. Over this framework, constituting what may be called the steel skeleton of the dam, a complete skin of steel plates is spread, and riveted to the framing in both a vertical and horizontal direction. All the steel plates are curved slightly upon the water side, and at certain regular distances expansion joints are provided to allow for the ordinary changes of temperature. It would be rather premature at present to speak decisively respecting this new type of reservoir-dam and the future before it, and it would be alike unwise and illogical, to adopt the Latin motto, *Ab uno disce omnes.* It must be borne in mind that the case is, so far, nothing more than a bold engineering experiment, with the laudable intention of establishing a reliable precedent, which must, however, stand the test of time before it can be accepted as a competent rival to its differently-constructed predecessors. These latter have, with occasional failures, which are by no means restricted to any particular description of engineering or architectural works, but really apply to all, stood successfully the test of time, and until the newcomer can show a somewhat similar record, it must "bide a wee," and take its chance.

It may be mentioned that the compound system of armoured concrete has been seriously taken into consideration by engineers, as well adapted for the construction of reservoirs, and on a future occasion we shall introduce the subject to the notice—which it fully deserves—of our readers.

T. C.

CHIPS.

The council of King's College, London, have appointed Mr. Ravenscroft Elsey Smith, A.R.I.B.A., to the Chair of Architecture and Building Construction, a vacancy caused by the decease of Mr. Banister Fletcher. Mr. Elsey Smith is the son of Professor T. Roger Smith, F.R.I.B.A., with whom he is in partnership at Temple Chambers, and whom he has assisted in the architectural classes at University College, Gower-street, W.C. Mr. Smith won the Institute Medal in 1887, and the Greek Travelling Studentship the following year.

The Staffordshire County Council have appointed Mr. H. T. Hare, of London, the architect for additions about to be made to their council buildings at Stafford, erected a few years since from Mr. Hare's design.

Sir F. Marindin and Mr. A. P. Trotter held an inquiry at Manchester, on Friday, on behalf of the Local Government Board, respecting the application of the corporation to borrow £800,000 for tramway purposes. One portion of the tramways system will be worked by Salford, another by Oldham, and another by Ashton-under-Lyne. The central portion, which will be under the control of Manchester, includes various localities, of which Stockport is one. The required loan will include the cost of the reconstruction of the whole of the present track within the city boundary, the electrical equipment of the whole of the city track with the outside districts already entered into agreement with, the provision of 600 cars, and a car-shed to accommodate 252 cars. The track mileage, including recent extensions, is about 150 miles, of which nearly 100 miles are owned by Manchester and local authorities. There was no opposition.

After undergoing reconstruction and being considerably enlarged, at a cost of upwards of £10,000, the Hospital for Diseases of the Throat, Nose, and Ear, Golden-square, W., was reopened on Tuesday by Lady Rothschild. By means of the present extension by three wings accommodation has been provided for 50 in-patients.

Early on Tuesday morning the Cromwell Statue on the lawn at the west side of the Westminster Hall, was unveiled. The ceremony was performed by one of the workmen of the Office of Works, and nobody other than officials were present. The only inscription on the pediment is the following: "Oliver Cromwell, 1599-1658." The figure, which is 10ft. high, is raised to the street level upon a massive Portland stone pedestal 12ft. in height, at the foot of which is a recumbent lion in bronze. The Protector is in military attire, and bareheaded. In his left hand he holds a Bible, and in his right a sword. Mr. Hamo Thorneycroft, R A., was the sculptor.

In the case of an application on behalf of John Joseph Wright, of Brighton, builder, the order of discharge from bankruptcy has been suspended for two years ending Oct. 6, 1899.

Mr. E. R. Hinchcliffe has been appointed assistant borough surveyor of Crewe in succession to Mr. Measham Lea, recently elected city surveyor of Truro.

Messrs. W. Potts and Sons, clock manufacturers, of Town Hall Buildings, Newcastle-on-Tyne, and Guildford-street, Leeds, have just erected a new clock, and fixed the same in the Cathedral, Carlisle, for the dean and chapter, the old one being worn out. The above firm have also just completed a new illuminated clock, showing the time on three external dials, at Jersey.

The parish church at Chalfont St. Giles, Bucks, has just been enriched by a gift of choir-stalls, presented by Calonel R. W. Phipps, Royal Artillery, in memory of his wife, who died on Oct. 25, 1885. The stalls are of carved oak, inclosed at the back by panelled arcading. Instead of poppy-heads as terminals, four figures of seated angels have been placed at the ends, suggested by similar work on the stalls of Ely Cathedral. The work has been executed by Mr. R. Bridgeman, of Lichfield, from designs by Mr. John Oldrid Scott, F.S.A. The new stalls were dedicated on Sunday last.

The new workhouse infirmary, Sandbach, is being warmed and ventilated by means of Shorland's patent double-fronted Manchester stoves, with descending smoke-flues, and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

BOOKS RECEIVED.

The current issue of the *Essex Review* (Chelmsford: E. Durrant) fully maintains the interest of this excellent county quarterly, which has now completed its eighth volume. Mr. F. Carruthers Gould writes and illustrates with his facile pencil the gruesome tale of the men defended under his first brief, under the title of "The Twins: a Story of the Mud Flats," Mr. A. P. Wire pens a biographical note of John Strype, the antiquary, whose portrait forms a frontispiece to the number, and other articles deal with "Members of Parliament for Colchester, 1747-1830," "Distinguished Essex Clergy and Laymen," and "Essex Parish Registers."——Messrs. Longmans, Green and Co. have republished the late William Morris's *Hints on Pattern Designing*, a lecture delivered at the London Working Men's College just eighteen years ago, as a half-crown booklet, set in old-style type.——A series of *Diagrams* exhibiting the *Discharges and Velocities* of circular and oval sewers and water conduits is drawn and written by Edwin B. Newton, F.S.I. (London: St. Bride's Press), and will be found very useful to borough and urban council surveyors. The diagrams are drawn from calculations based upon Weisbach's well-known formula, and deal with discharges up to 300c.ft. per second, and with velocities up to 15ft. per second. Some useful notes on the designing of sewerage schemes are appended.——*Building Construction for Beginners*, by J. W. Riley, Lecturer in Descriptive Geometry, Building Construction, &c., Rochdale (London: Macmillan and Co., Ltd.)—This little book is intended to meet the requirements of candidates preparing for the Elementary Examination on Building Construction of the Department of Science and Art, and is arranged upon a scheme that the author has found to work well. The treatise deals with all the leading branches of building, and is numerously illustrated by drawings in isometric projection—a more intelligible way of representing such things as brickwork, masonry, and carpenters' work than plans and sections. The chapters on masonry, girders, and ironwork, including trussed beams, plate and box girders, riveted joints, floors, and iron roof trusses, are well treated, and every technical term and method of construction is described and illustrated, with copious examination questions at the end of each. The author shows the details of construction, and how such things as roofs and gutters are formed, so that he is not left in ignorance of the application of the various trades. The details of iron roofs and connections are very fully illustrated by large-scale drawings, figured. The joints in joinery are also very clearly shown. This little book is the most comprehensive for its size and pretensions we have seen, and there are 623 illustrations, the price being only 2s. 6d.——*Exercises in Graphical Arithmetic and Graphical Statics*, by Fras. C. Forth, Royal Scholar, Assoc.R.C.Sc.I., Lecturer, Mechanical Engineering Department, Manchester (Manchester: John Heywood, Deansgate), is a collection of exercises systematically arranged. The book is printed in a running hand (not type-written), and every page is illustrated by diagrams. Many of the questions are taken from the Science and Art Department, and include exercises in plain and solid geometry, building construction, applied mechanics; others have been introduced bearing on difficult problems. Graphical statics include many everyday examples of beams, reaction of supports, loads unequally distributed, bending moments, stress diagrams applying to all types of trusses, each question being illustrated by a figured diagram. For the instructor in this department of applied mechanics, as well as in theoretical mechanics, these questions will be found of great service, and students will find the exercises useful. It is a pity the author has not supplied answers by which the student could test his knowledge. The exercises are in paper covers, and the price only 1s. 3d.

* * *

The Tralee and Dingle Light Railway are starting their work, as tenders for sleepers have now been invited.

Bidston Hill, Birkenhead, which commands splendid views and affords delightful and health-giving recreation for residents on both sides of the Mersey, has passed into the possession of a public trust, mainly through the exertions of gentlemen anxious for the people's welfare. The fund for its purchase has remained open many months, and over £2,000 have been secured.

OBITUARY.

The funeral took place on Friday at Anfield Cemetery, Liverpool, of Mr. George W. Rutter (Messers. G. W. Rutter and Company), who died at his residence, Wood Bank, Rock Ferry, on the 7th inst., in his 69th year. The late Mr. Rutter had long carried on in Liverpool the business of a builder's merchant.

CHIPS.

Mr. Edward Lantéri, who has for many years presided over the modelling classes at the Royal College of Art, South Kensington, is giving a course of seven lectures on the modelling of the figure from life at the Municipal School of Art, Manchester, during the present month.

The cost of repairing the damage done by the recent collapse of columns in the great hall of the temple at Karnak and strengthening the edifice is estimated at £50,000 sterling.

Colonel Sir Francis Marindin and Mr. Trotter, inspecting officers of the Board of Trade, have inspected and passed the new Govanhill route of the electric tramways belonging to the Corporation of Glasgow. The party were conveyed across the depot line from Coplawhill to Cathcart-road, and over the whole of the new route from Govanhill to Springburn, which extends to 3·89 miles. The length of the extended line is about 1¾ miles. The new route forms a continuation of the route from Springburn to Glasgow Cross, and the cars which hitherto turned at Glasgow Cross will now run right through to Govanhill.

At Brookwood Necropolis, Surrey, a Roman Catholic mortuary chapel has just been built from plans by Mr. Cyril W. Tubbs, the architect to the Necropolis Company. The cost was £1,000, and the formal dedication was held last week.

The Hon. Lyulph Stanley opened a new school in Brunswick-road, Bromley, E., on Friday. The school has been built to accommodate 1,138 children, and the cost of the site was £10,884. The expenditure on the building is estimated at £28,223.

The members of the Edinburgh Architectural Society held a meeting on the 8th inst. in Dowell's Rooms, Edinburgh, when Mr. Robert Wilson, architect to the School Board, gave a lecture on "The Planning of Schools." Limelight views were exhibited of the plans of several Edinburgh schools, including those of the Flora Stevenson School, Comely Bank.

Plans have been approved for the enlargement of the Roman Catholic church at Farm-street, Berkeley-square, by piercing the ugly blank wall which has hitherto disfigured the left side of the nave, and building a new aisle to balance the one on the right. Some stabling that previously prevented this extension has been acquired by the Jesuit Fathers, and the alterations may be begun forthwith. The designs are by Mr. Romaine Walker.

The urban district council of Morecambe decided on Monday to borrow £9,700 for the construction of 35 new streets at the east and west ends of the town.

At the last meeting of the King's Norton Board of Guardians the finance committee recommended the payment of cheques amounting to £2,381 to Mr. Thomas Robotham, architect, in settlement of his account for the building of the infirmary. This sum, the chairman explained, had been agreed upon by arbitration as a full discharge of the claims against the guardians, whose troubles with regard to the infirmary were now brought to a close. The recommendation was adopted.

The Earl of Jersey, on behalf of the Light Railway Commissioners, presided on Friday at a public inquiry at Leighton Buzzard to consider the expediency of granting a local application for an order to construct a new line from that town to Hitchin, for the purpose of connecting the London and North-Western and Great Northern systems. The length is 20 miles, and the estimated cost about £100,000. No serious opposition to the scheme was raised, and it was decided to recommend that the application be granted.

The second annual meeting of the Great Yarmouth Master Builders' Association was held at the Duke's Head Hotel in that town last week, Councillor G. W. Beech in the chair. The annual report and balance-sheet were read and confirmed, and the following officers elected: President, Mr. G. W. Beech; vice-presidents, Messrs. W. Wright and R. Carter; treasurer, Mr. J. Ward; hon. secretary, Mr. G. H. Wright; and assistant secretary, Mr. F. Grimble.

A new Baptist Chapel in Alfred-road, Ford, near Devonport, was opened last week. Messrs. Wiblin and De Boinville, of Plymouth, are the architects, and Mr. W. Partridge was the contractor, and the outlay has been about £3,000. The style is Gothic, and accommodation is provided for 500 worshippers.

Engineering Notes.

Leith Docks.—The *Scotsman* gives an account of the progress being made with the additions to the docks at Leith. The enlargement has involved the reclamation of upwards of 75 acres of foreshore. This reclamation was accomplished before the beginning of 1897, and from that time onwards the construction of the dock proper, with its entrance lock and basin, and its communications with the existing docks, has steadily proceeded. The dock is 1,100ft. long and 550ft. broad. It is wholly surrounded with massive masonry walls about 20ft. thick at the base and 44ft. in height to the coping. All the walls of the dock and the lock and passage to the Albert Dock have been completed up to coping level, with the exception of a portion of the wall at the east end, while the granite coping for nearly the whole of the north and south sides of the dock has been placed in position. In fact, so far as the dock, lock, and passage are concerned, the masonry is practically finished. The same may be said regarding the work of excavation, for the remaining material could be lifted in five or six weeks. The gates have been constructed entirely of steel and fine Yorkshire iron. Those at the west end of the lock are almost completed; each leaf weighs 145 tons, while the pressure of the water the two halves will have to withstand at spring tides will be equal to 1,200 tons. Sir W. Armstrong and Company, the contractors, are now busily engaged in erecting the inner gates, and also the gates in the passage leading to the Albert Dock. In about six months the greater part of this work will be accomplished. In the mean time, the contractor for the dock works, Mr. John Best, is engaged in the construction of the basin, which lies between the west end of the lock and the harbour. This done, a portion of the East Pier will be removed to give a clear waterway between the harbour and the new lock. The works are being carried out from plans prepared by the harbour and dock superintendent, Mr. Peter Whyte, C.E. While the works have been in progress, it has been decided to extend the new dock eastwards by 800ft., so as to make it 1,900ft. long (instead of 1,100ft.), and to give additional quayage accommodation of upwards of 1,600ft. This extension, however, is only being made half the width of the dock—550ft. The commissioners are also constructing a new graving dock 500ft. long, with an entrance 70ft. in width, and with a depth of water on the sill of 23ft. An adjunct to these works has recently been completed by the erection of a new hydraulic-power station at the north-west corner of the Edinburgh Dock. The engine and boiler-house is a red brick building surmounted by a tower, 80ft. in height, in which the "accumulator" works for giving the necessary water-pressure. The engines have been constructed at the Elswick Works of Sir W. G. Armstrong and Co., who have also supplied the whole of the machines for working the dock gates.

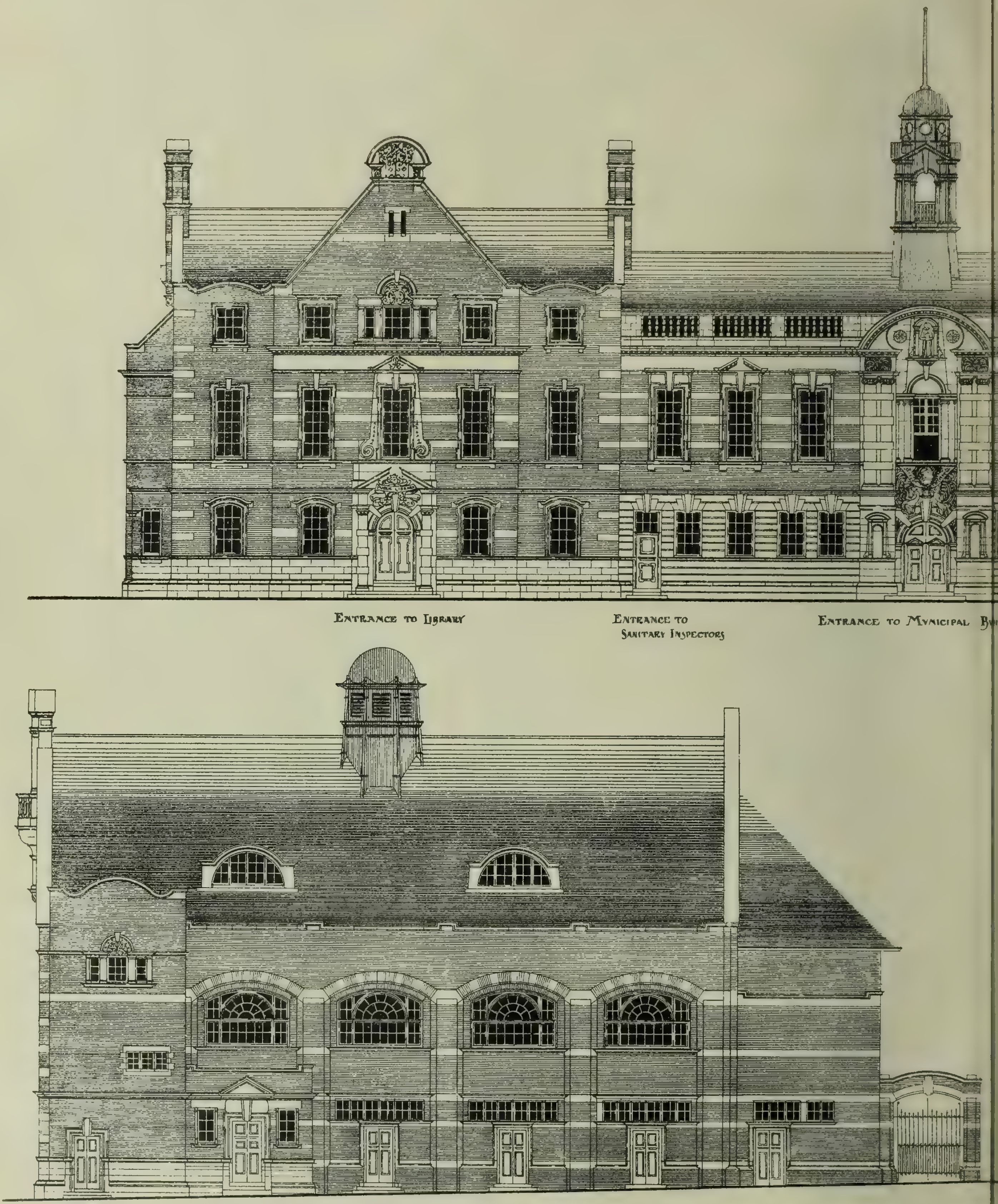
* * *

At Cuckfield, Sussex, the Jubilee public hall was opened last week. The chief room is 58ft. by 28ft., and is seated and furnished in pitch-pine for an audience of 350 persons. Mr. S. Knight, of Cuckfield, designed and built the hall.

Lord and Lady Denbigh, on Monday, held a reception at the Royal Orthopædic Hospital in Hanover-square, at the reopening of the hospital after extensive repairs and alterations, effected at a cost of £2,000.

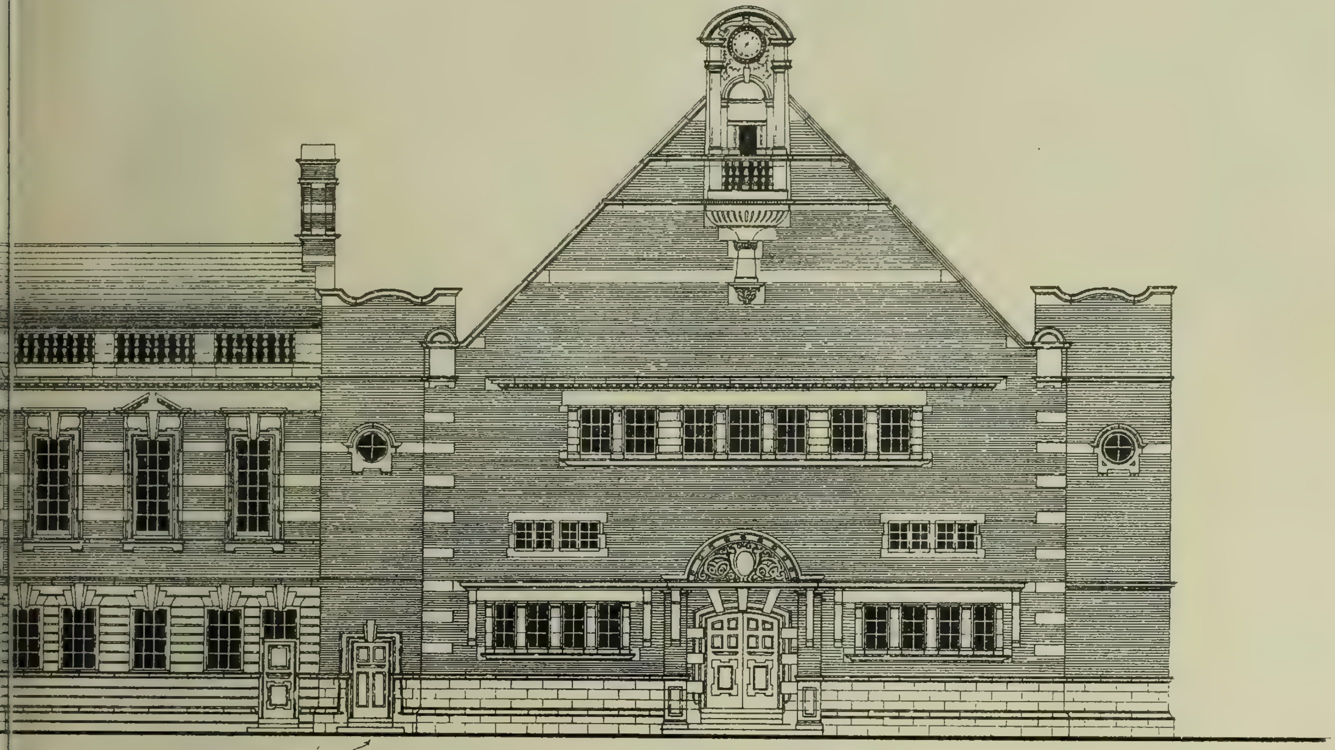
The sum of £2,550 has been anonymously given towards the £10,000 still required for the Walsham How memorial at Wakefield. According to an appeal published by Bishop Eden, £17,000 has been already either paid in or promised, and a fund for the endowment of the first stall in the cathedral is anticipated. Tenders are being invited for the execution of the work from Mr. Frank L Pearson's plans. The scheme will involve an expenditure of about £20,700, and provides generally for an eastward extension of the edifice for about 60ft., with spacious north and south transepts, which must contribute materially to the dignity and cathedral-like aspect of the interior. Increased length will be given to the choir stalls, and a retro-choir and chapel will afford ample accommodation for early and occasional services. A chapter-house and vestries are also contemplated. Six shops in Teall-street, adjoining the cathedral, and certain rights of light, have been purchased for £8,250, in order to enable the extension to be carried out. Two sculptors have been asked to prepare designs for a recumbent effigy of the late bishop.

MVNICIPAL BVILDINGS AND PVBLIC LIBRARY

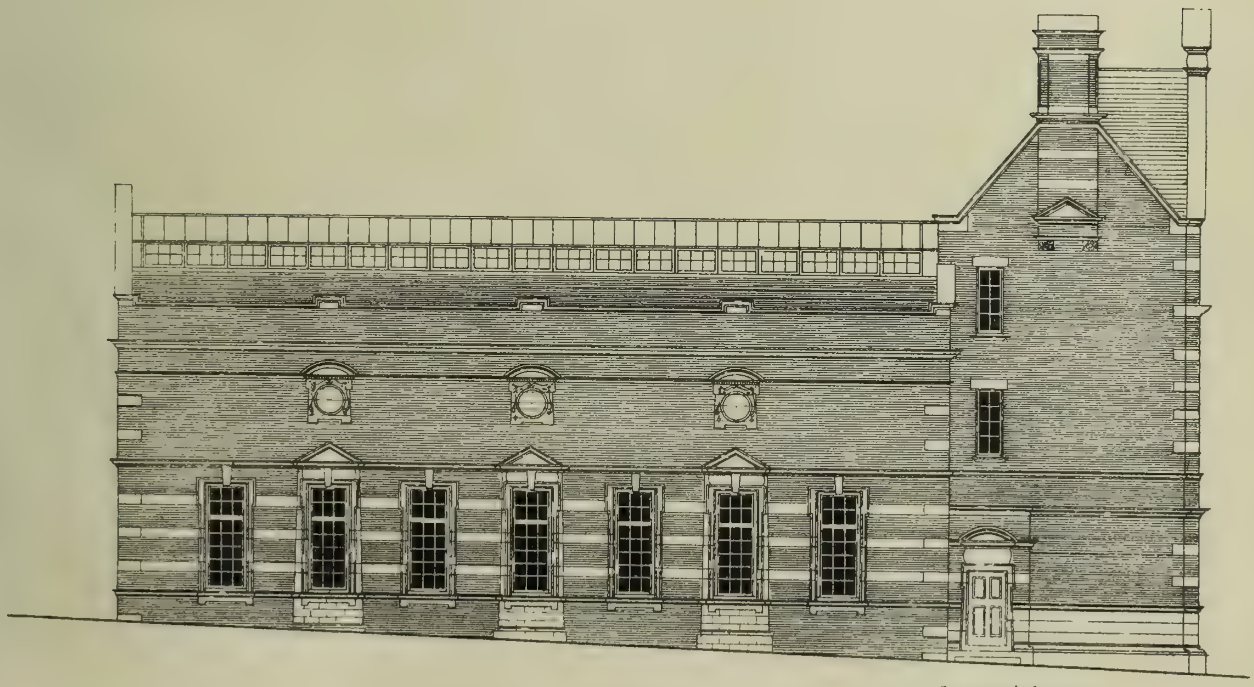


ELEVATION TO PARK ROAD

PLUMSTEAD · THIRD PREMIATED DESIGN, POTTER & CRANFIELD, ARCHITECTS.



Elevation to Gossage Road



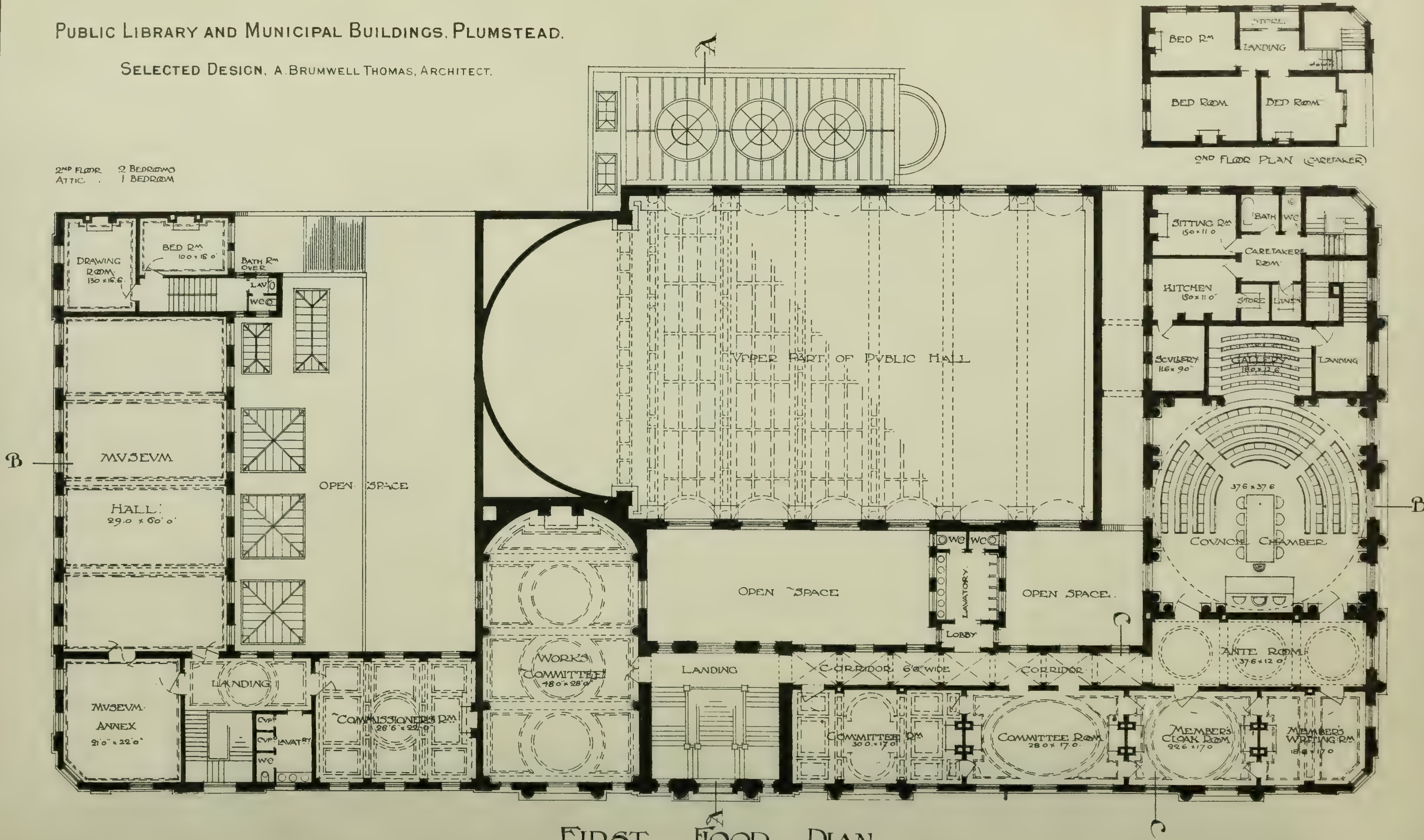
Elevation to Ancona Road

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

THE BUILDING NEWS, NOV. 17, 1899.

PUBLIC LIBRARY AND MUNICIPAL BUILDINGS, PLUMSTEAD.

SELECTED DESIGN, A. BRUMWELL THOMAS, ARCHITECT.



FIRST FLOOR PLAN.

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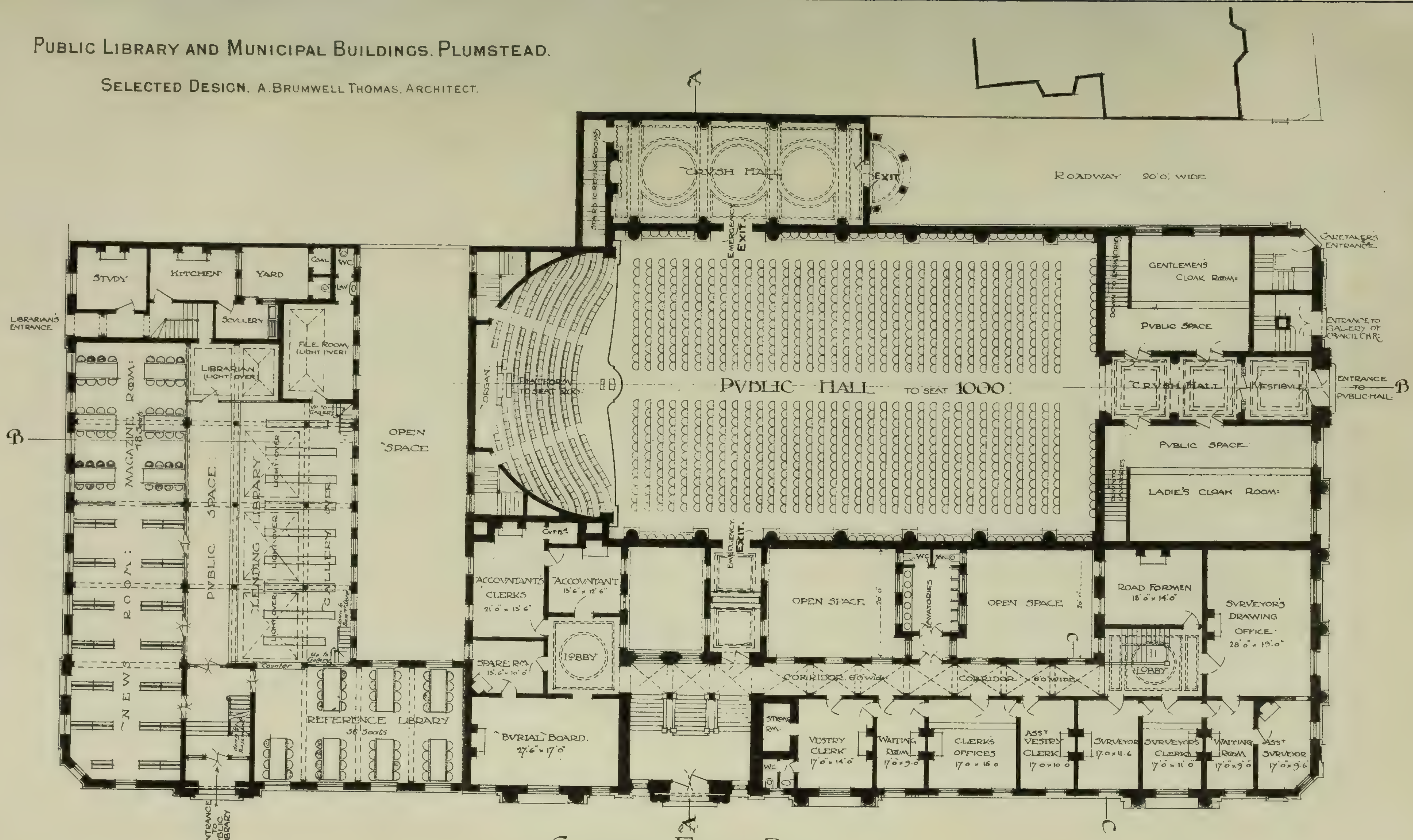
PUBLIC LIBRARY AND MUNICIPAL BUILDINGS, PLUMSTEAD.

SELECTED DESIGN. A. BRUMWELL THOMAS, ARCHITECT.



GROUND FLOOR PLAN:

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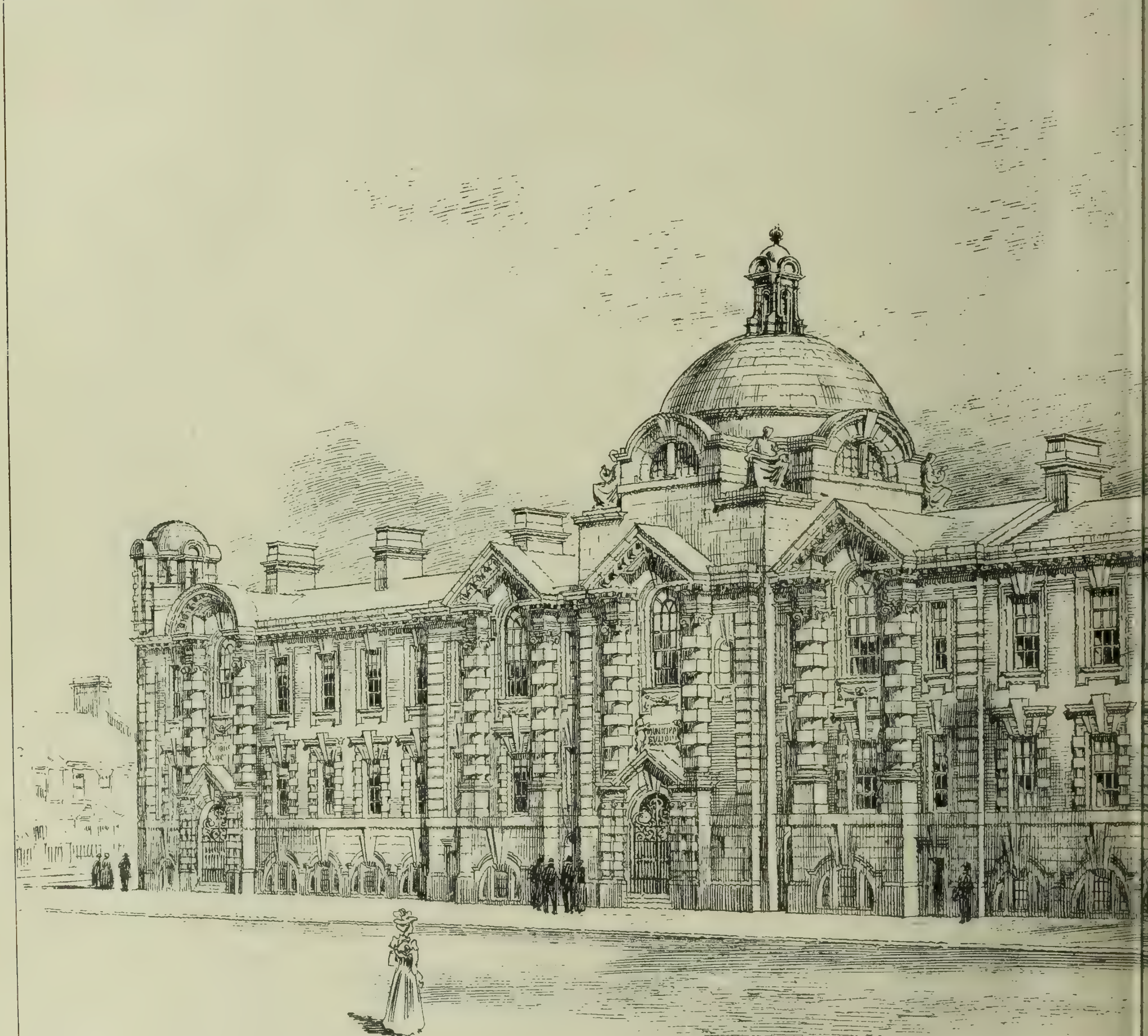
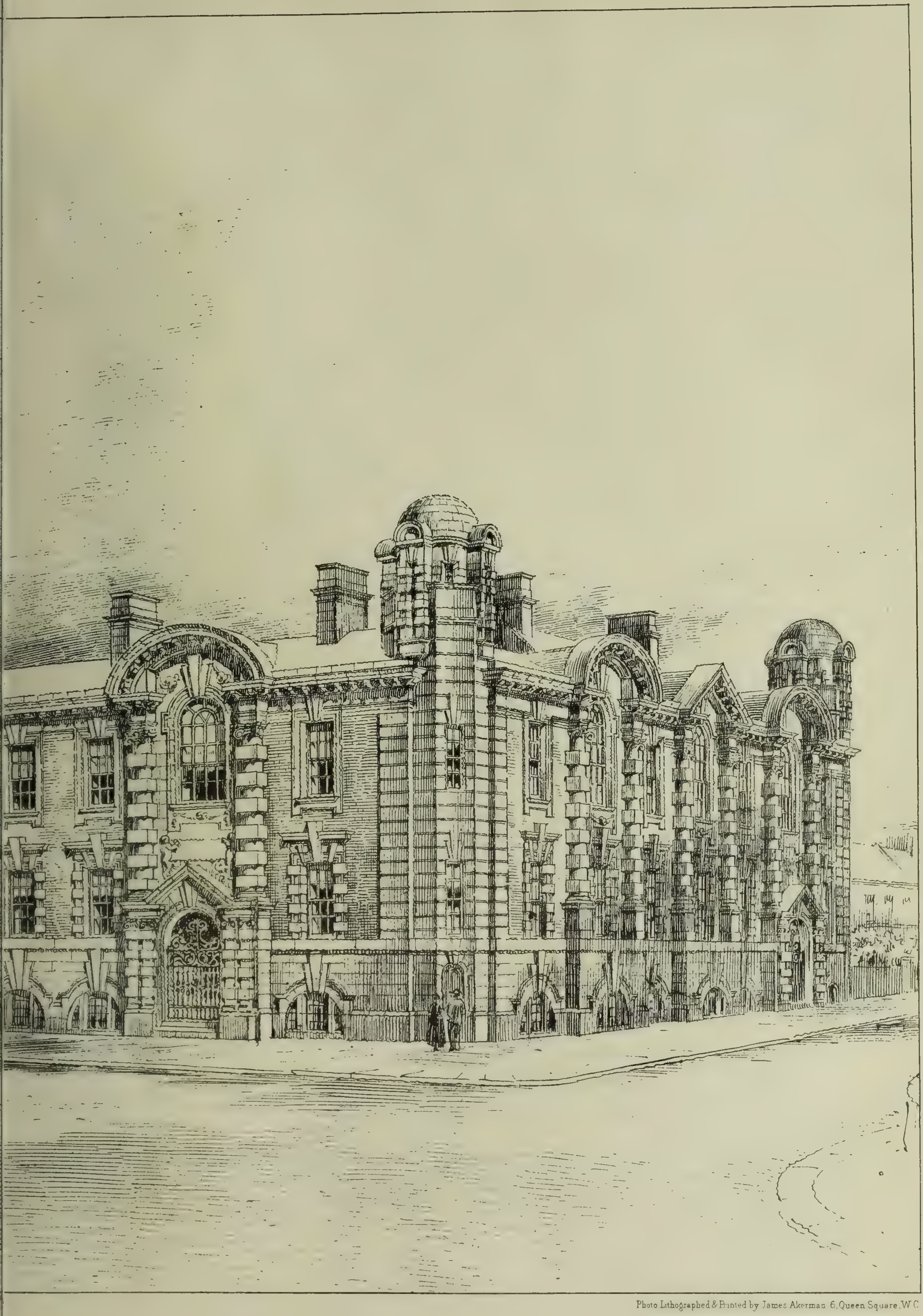
PUBLIC LIBRARY AND MUNICIPAL BUILDINGS, PLUMSTEAD.

SELECTED DESIGN, A. BRUMWELL THOMAS, ARCHITECT.





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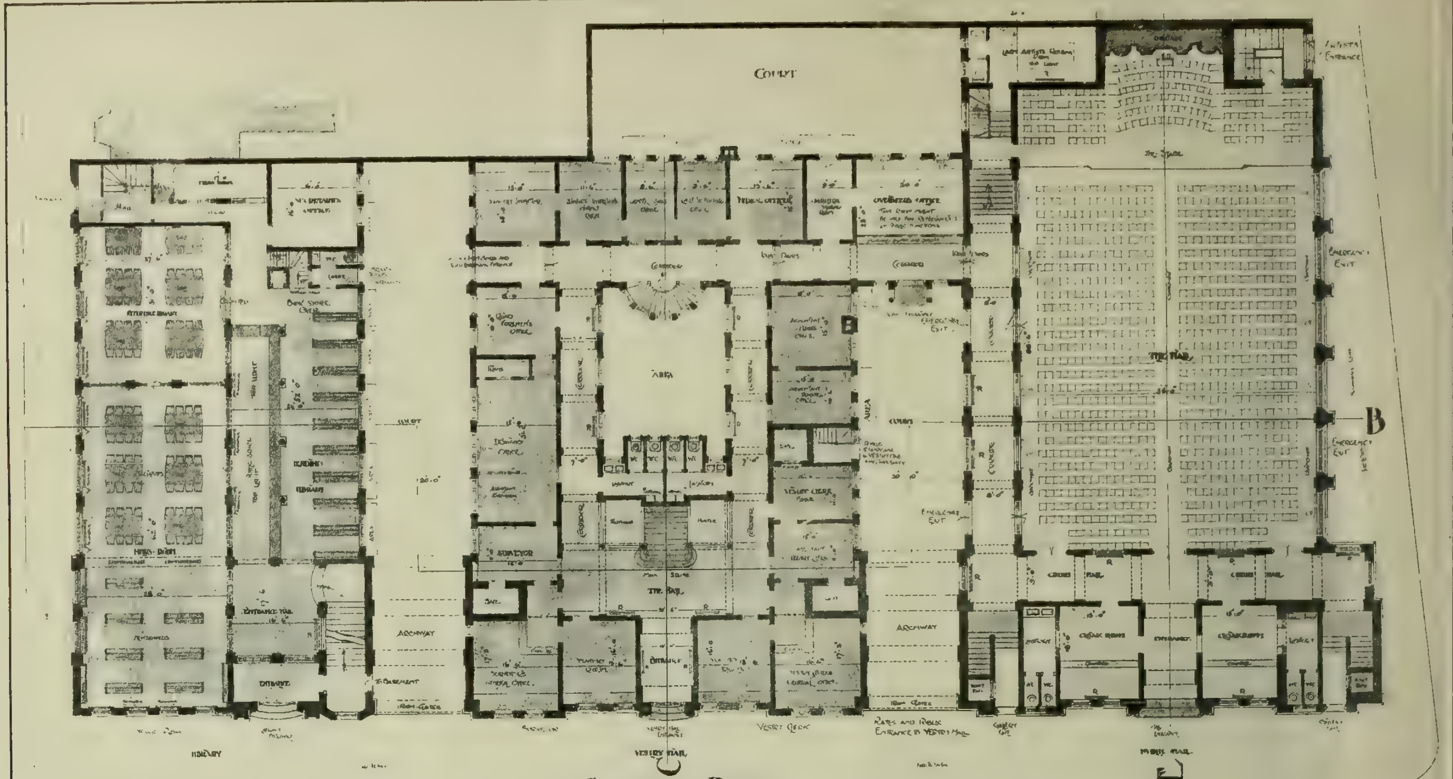
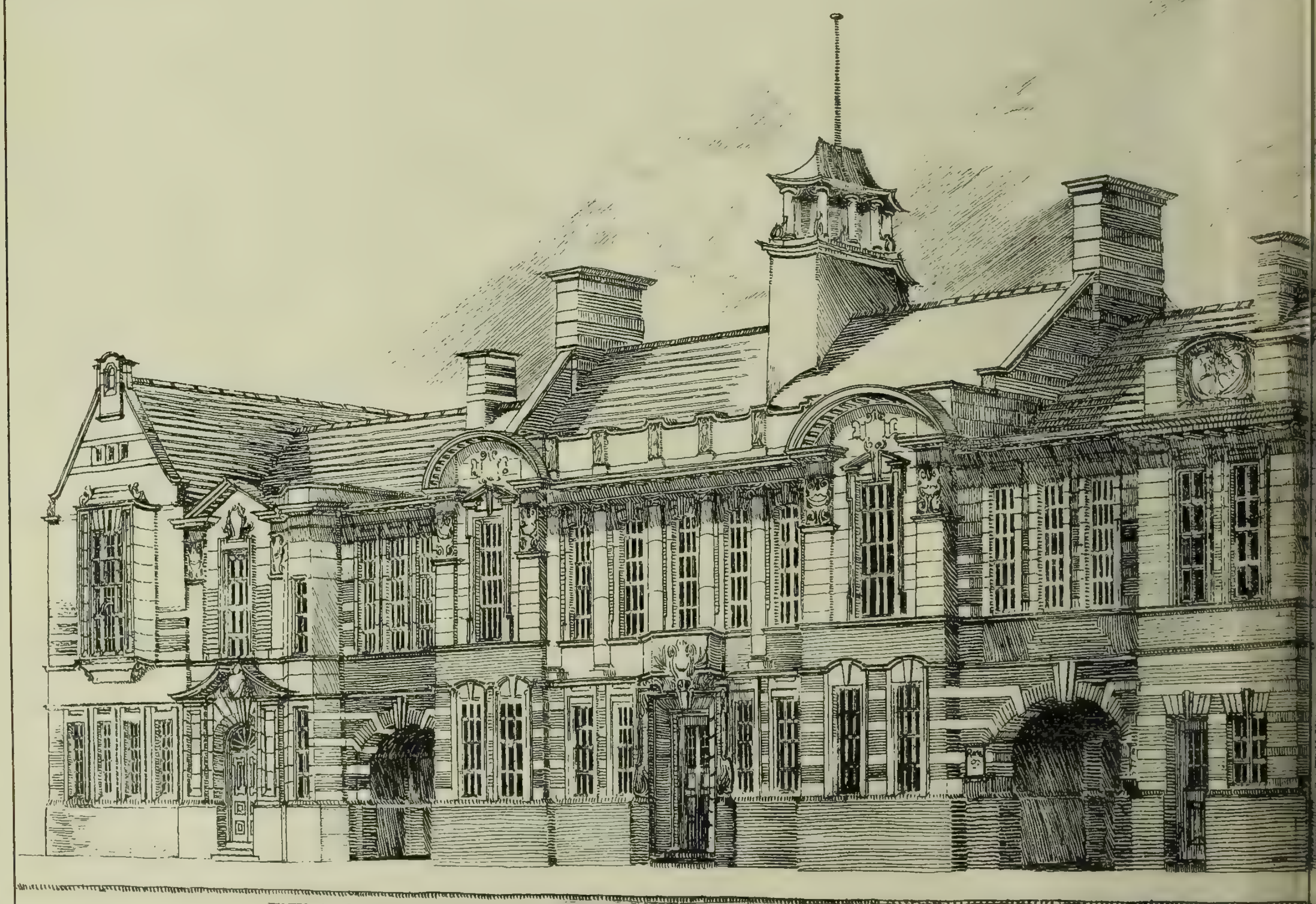
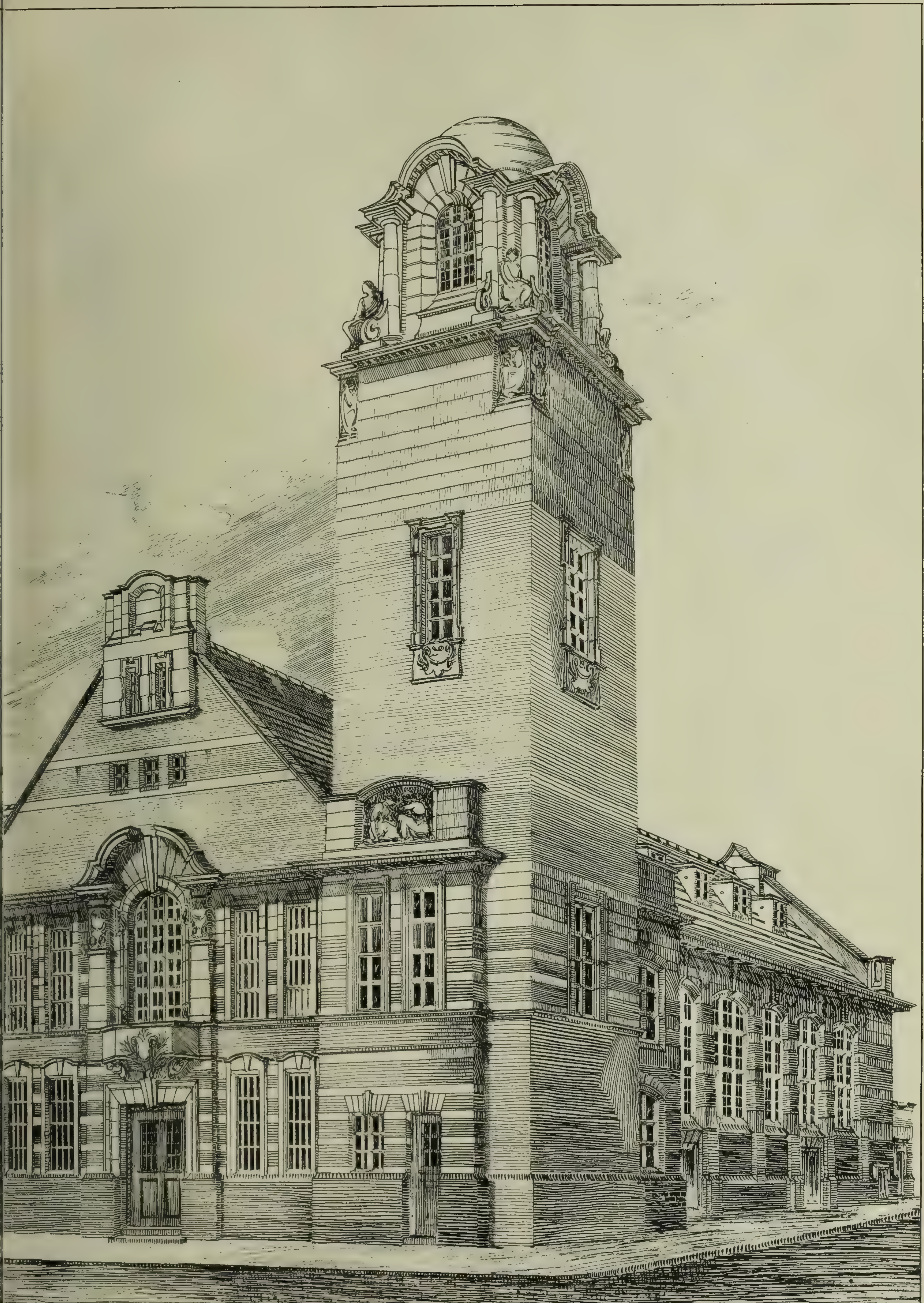


GROUND·PLAN



PUBLIC LIBRARY AND MUNICIPAL BUILDINGS. PLUMS



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AD. SECOND PREMIATED DESIGN, HALL COOPER & DAVIS, ARCHITECTS

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ILLUSTRATIONS.

PLUMSTEAD LIBRARY AND MUNICIPAL BUILDINGS: SELECTED, SECOND PREMIATED, AND THIRD PREMIATED DESIGNS.—BRISTOL JUBILEE CONVALESCENT HOME.

Our Illustrations.

PLUMSTEAD MUNICIPAL BUILDINGS AND PUBLIC LIBRARY: SELECTED DESIGN.

The scheme includes municipal offices, public hall, and public library on a site (after deducting the 20ft. road necessitated by the L.C.C. regulations) about 250ft. by 110ft. We illustrate the general view and two chief plans. The three divisions of the building are each entirely self-contained and distinct, except that communication is provided between the municipal offices and public hall, for municipal purposes. The public hall is designed to seat 1,000 persons in the auditorium, and 200 on the platform, with space for organ. The entrance is in Park-road. Cloak-rooms of ample dimensions are placed on each side of entrance hall, with lavatory accommodation in basement. The crush hall, provided at the side exit, will form a valuable adjunct to the hall, and leading into the 20ft. road should, with the other exits, provide sufficient means of egress in case of emergency. The municipal offices are arranged on three floors; the council chamber and committee rooms being on the upper floor, vestry clerk and surveyor's departments on ground floor, and the remaining departments on the lower ground floor. The council chamber provides seating for 100 members of vestry and officials, and 70 in public space, to which separate access is provided from the street. The council chamber, together with the ante-room, members' cloak-room, and writing-room, forms a complete suite of apartments. The public library is all arranged on the ground floor, the issuing-room being the centre of supervision, and communicates directly with news and magazine-room and reference library. Each department is also accessible from the entrance-hall. On the upper floor are placed the large museum, annexe, and commissioners' room. The librarian's house occupies three floors and is self-contained, communicating with the library on ground floor. Fire-resisting construction will be adopted generally, the floors being of steelwork imbedded in concrete, and the large-span roofs having steel trusses. The elevations are to be in red brick and Portland stone, with Westmoreland slate roofs. The heating to be low-pressure hot water, except to public hall, council-chamber, library, and museum, which will be on plenum system. The cost at present is limited to £40,000. Mr. A. Brumwell Thomas, of Westminster, is the architect of this first premiated design, and the Vestry will carry out the buildings from his plans. Next week we propose to give the geometric elevations of his scheme, which in some respects hardly gains from the perspective. The entrance to the fore front of the main façade, as seen in the view, was incorrectly inserted by the draughtsman by an oversight. The plans and the elevations are in agreement, however, and this item in the perspective does not concern the general merit of the scheme as a whole.

PLUMSTEAD MUNICIPAL BUILDINGS: SECOND PREMIATED DESIGN.

The authors' endeavour was to plan a scheme that could be built in blocks. The large hall, with its principal front and one long side abutting upon roads, with entrances and exits as shown upon plan. There is a wide corridor up one side of main hall to the platform. The artists' entrance is directly off side street. The large hall is connected with the vestry offices by the rate office, which could be converted into refreshment room at public dances, &c. The vestry offices are arranged in the centre of the site, with entrances from the side courts for the workmen, for the public going to gallery of council chamber and for caretaker. The library is planned at the opposite end of site to the large hall, with news-room and reference library lighted direct from the side street. The materials proposed to be used for the exterior were red brick and Portland stone, the roofs to be covered with Westmoreland green slates. Fittings of large hall and council chamber were to be in oak, with friezes in modelled plaster. The authors are Messrs. Hall, Cooper, and Davis, 21, Old Queen-street, Westminster, and Scarborough.

PLUMSTEAD MUNICIPAL BUILDINGS: THIRD PREMIATED DESIGN.

The chief points which influenced the working out of this design were that the ground floor of the library should occupy the whole of the site given up for that building. That all the municipal offices should be on one floor, each department being self-contained, including lavatory accommodation. That the public hall should be kept away from the library, and have a maximum frontage to public roads. The municipal buildings and public hall were estimated to cost £27,080 and the public library £12,090. The architects are Messrs. Potter and Cranfield, of Lincoln's Inn-fields, W.C.

THE QUEEN VICTORIA JUBILEE CONVALESCENT HOME, BRISTOL.

The premises originally known as "Waynflete," which have been purchased by Mr. E. P. Wills and handed over to the city for a Convalescent Home, to commemorate the Queen's Diamond Jubilee, were erected about eleven years ago for the Rev. J. H. Wilkinson, M.A., as a high-class boarding school for boys. The architect is Mr. W. L. Bernard, F.R.I.B.A., of Bristol, and the same gentleman has given his services as honorary architect in designing and superintending the various alterations necessary to convert the premises into a convalescent home, which was opened by the Queen on Wednesday, when Mr. Bernard was formally presented to Her Majesty. The building, which is splendidly situated at the edge of Durdham Down, at the top of Black Boy Hill, stands in its own grounds of three and a-half acres, and from its windows there is a fine view in all directions. The plan of the existing building, which has a wide corridor in the centre on each floor running east and west for the whole length, with the various rooms on either side, was found to be admirably adapted for the special requirements of a convalescent home, and but little structural alteration was necessary. On the ground floor of the building a new dining-hall has been formed, capable of accommodating all the inmates; and other of the rooms have been devoted to smoking and day-rooms for men, lavatories and cloakrooms for men and women, servants' hall, kitchens, sculleries, and the usual offices necessary for such an institution. A verandah of iron and glass has been constructed on the south side for the whole length of the building between the wings, and will form a cheerful covered lounge for the inmates. All the windows of the rooms facing south on the ground floor, and of all day-rooms on the upper floors, have been lowered, so that patients can easily see into the beautiful grounds. The principal entrance to the institution is from the north side, where a handsome new porch with stone steps and balustrade has been constructed, leading into an inner hall, from which the main corridor is entered. On this floor on the south side are day-rooms and dormitories for men and women, the former at the east end and the latter at the west end of the building; the lady superintendent's sitting-room, nurses' dining-room and sitting-room, medical officers' consulting-room, dispensary, and a small office and waiting-room adjoining the entrance-hall. The large room in the centre facing north, that was formerly the boys' dining-hall, has been made into the principal day-room for women. The second floor contains dormitories for the inmates and bedrooms for the lady superintendent and nurses, and in the centre, on the south side of this floor, is the chapel. The third floor contains further dormitories and rooms for nurses and servants. All the day-rooms and dormitories are well lighted, spacious, and airy, and well warmed and ventilated. Access to the various floors is by means of staircases, of which there are three—one at each end for men and women respectively, and one in the centre for servants' and general domestic use. A large passenger lift, running the whole height of the building, has been constructed, with access from all floors, for the use of those patients who may be unable to use the staircases. There are also other lifts in the building for coal and luggage and for dinner service. The general contractor for the works was Mr. Edward Walters, of Richmond-road, Montpelier.

CHIPS.

The foundation-stone of the Woolston cottage hospital was laid in Doddington-road, Wellingborough, last week. The contract for the erection of the hospital was £2,140, and the building is being erected by Messrs. E. Brown and Sons, from the designs of Messrs. Sharman and Archer, of Wellingborough.

At the statutory general meeting of Robert Stephenson and Co., Ltd., engineers, &c., held last week at the Central Station Hotel, Newcastle-on-Tyne, the chairman Sir Joseph Pease, stated that the terms asked for the renewal of their lease of the old engine works erected in Newcastle by George and Robert Stephenson, and which has still 11 years to run, were so high that the directors had bought freehold land at Darlington, where they intended to build, with all possible improvements, new locomotive works.

On Saturday, at Messrs. J. and A. Gardner and Co.'s granite quarries on the shore of Loch Etive, at Bonawe, a monster blast was successfully fired. Five tons of gunpowder were used in two chambers. The quarrying of these chambers, and the passage leading to them, occupied about eleven months. The charge was fired by electricity, and the granite was slowly upheaved, thousands of tons sliding down to the quarry floor.

On Saturday afternoon ten memorial-stones were laid of a new Wesleyan chapel in Fleet-street, Bradley, Nelson. The cost of the building will be £4,000, and accommodation will be provided for between 700 and 800 people.

The funeral of the late Mr. John Gethin, builder, and a member of the Shrewsbury Town Council, took place at the Shrewsbury General Cemetery last week, and was very largely attended, not only by members of the corporate body, but also by the tradesmen of the town.

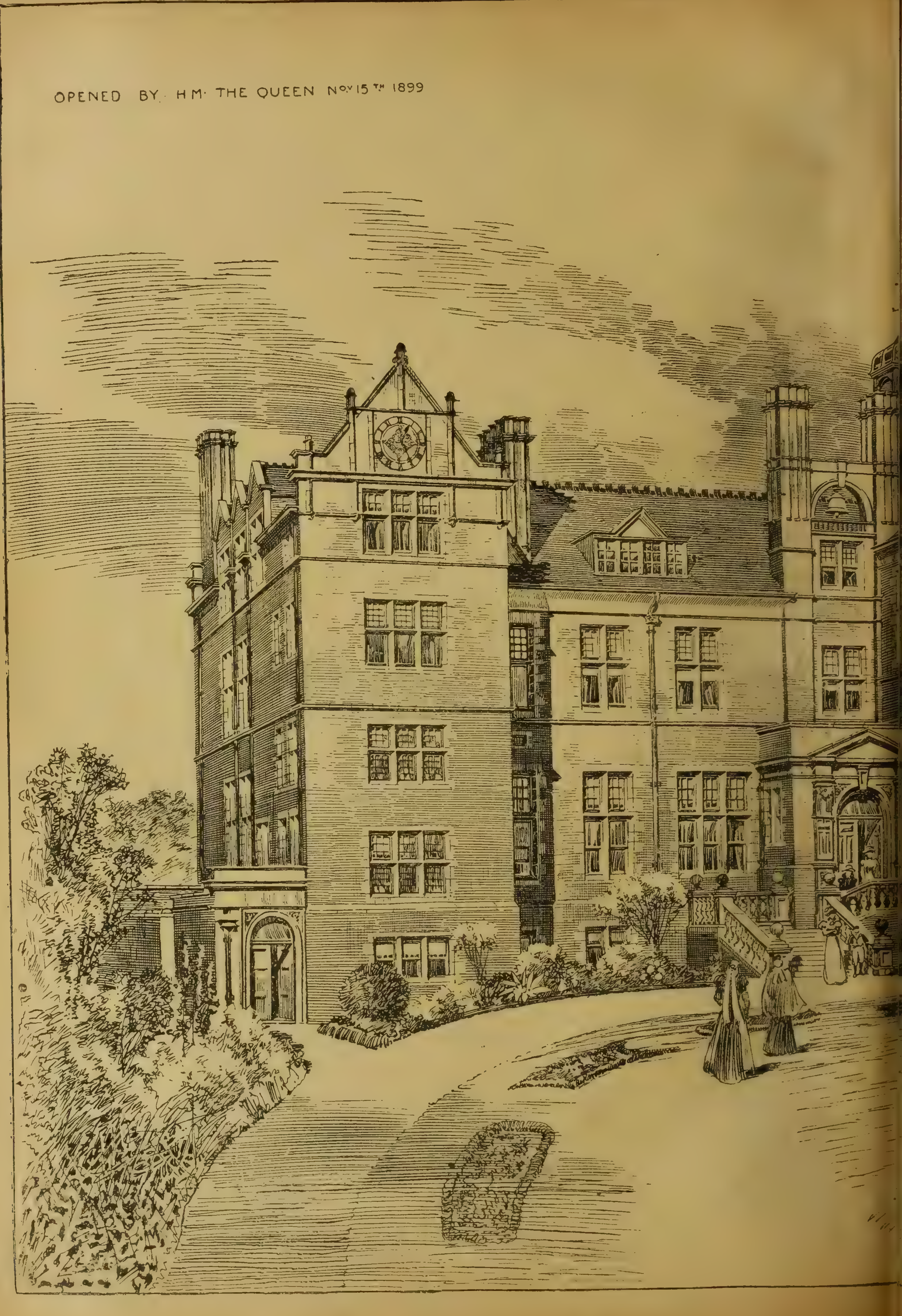
The Camberwell board of guardians have finally adopted revised plans for the extension of their workhouse and infirmary. Mr. Edwin T. Hall, F.R.I.B.A., of Moorgate-street, is the architect, and the estimated outlay, according to the revised and reduced plans, is £160,000, a reduction of £48,000 on the cost of the designs submitted in June last.

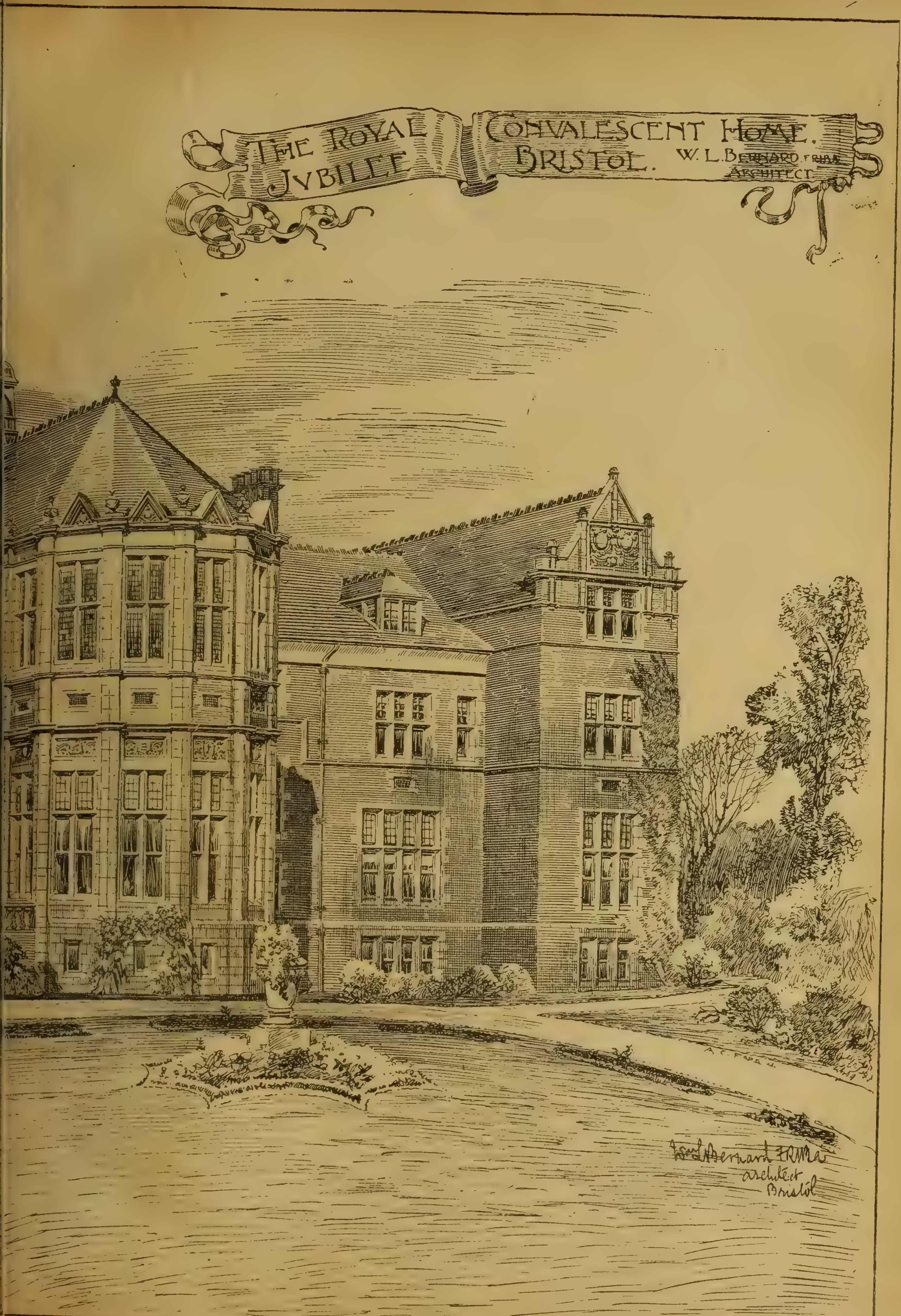
A new sanatorium, which has been built at Burnley at a cost of £20,000, was opened on Saturday. The institution is for the treatment of infectious diseases, and has been constructed jointly by the Burnley Corporation, the Burnley Rural District Council, Padiham Urban Council, and Brierfield Urban Council. Seven acres of land have been inclosed, and the buildings at present comprise fever pavilion, isolation pavilion, administration block, laundry, mortuary, and porter's lodge. Accommodation is provided at the outset for 30 beds, but space is left for an additional pavilion to increase the number to 130, as required. The work has been carried out from the designs and under the direction of Mr. F. S. Britton, of Burnley.

The Cornish Committee appointed to organise a memorial to Major General Sir William Penn Symons have decided to place a stained-glass window in Botusfleming Church, and to erect a small local memorial in Saltash.

Colonel W. Langton Coke, M.I.C.E., an inspector of the Local Government Board, held an inquiry at Barnsley, on Friday, touching an application of the Corporation to borrow £3,661 for the purpose of installing the electric light into the Harvey Institute, the Corn Exchange, the market, weigh-house, registrar's house at the cemetery, and the public baths.

The Archbishop of York has confirmed the appointment of Mr. Brierley, architect, of York, as diocesan surveyor for the York District, to act in conjunction with Mr. Demaine.


OPENED BY H M THE QUEEN Nov 15th 1899


THE ROYAL JUBILEE CONVALESCENT HOME. BRISTOL.
W. L. BERNARD F.R.I.B.A. ARCHITECT.
A. C. Fare d.
W. L. Bernard F.R.I.B.A. architect Bristol

Building Intelligence.

Brechin.—The cathedral restoration committee have received a letter from Sir William Laird, clerk and treasurer to the Baird Trust, stating that the plans showing the proposed restoration of the cathedral of Brechin had been submitted to the trustees. He was authorised to say that, on the completion of the work in conformity with the plans first submitted, the trustees were disposed to make a grant of £1,500. They were, however, desirous that the proposed additional aisle on the north side of the church should be erected, and if that were done they would increase their contribution by £500, making a total of £2,000. An anonymous donor had intimated a subscription of £250 if the proposed north aisle is carried out.

Bury, Lancs.—To-morrow (Saturday) the foundation-stone of the new Church of St. Peter, Bury, will be laid by the Earl of Derby. The church, which has been partially taken down, was modern, having been built in 1871. The rebuilding is to a great extent on the old foundations, strengthened where they were deficient, and the old plan and general design have been followed as far as was consistent with sound construction. A large western entrance porch is added, and the vestries for clergy and choir are extended to twice their original size. The builder is Mr. Charles Brierley, of Bury; Mr. Medland Taylor, of Manchester, is the architect, and Mr. Joseph Clare the clerk of works.

Charing Cross Road, W.C.—Wyndham's Theatre, built from plans by Mr. W. G. R. Sprague on an isolated site in Charing Cross-road and St. Martin's-court, was opened yesterday (Thursday). It is faced with Portland stone on every side, and is Modern Renaissance in style; the frontage to the main road is 84ft. The chief entrance leads into a circular crush-room and descends a marble staircase to the seats, of which there will be over 200. By ascending another marble staircase the dress circle is reached, and here there is accommodation for some 150 persons. The width of the auditorium is about 54ft., and the same distance separates the back wall of the pit from the curtain-line. The decoration of the interior has been carried out in the Louis XVI. style, the upholstery being pale blue in tint. There are a dozen boxes. The refreshment-bars are conveniently placed, and as the cantilever system has been adopted there are no pillars to obstruct the view from any corner. The proscenium, which is a "floating frame," like that at the Haymarket, has an opening of 26ft. It is surmounted by a moulding, in which have been designed figures holding medallion portraits of Goldsmith and Sheridan. The stage is 30ft. deep and 62ft. wide, and has a height to the grid of 50ft., which will enable all scenery to be lifted, thus obviating damage by rolling. There are two new features in this house. The first is the roof garden, which is an iron framework erected between the proscenium wall and the main frontage. This will be used as a lounge, and has a platform upon it. The "garden" is 54ft. wide and 44ft. long. The second novelty is the lift, which will run from the entrance to the stalls to the glass house on the roof.

Hoxton, N.E.—The Earl of Rosebery formally opened on Monday the new municipal buildings erected by the Shoreditch Vestry in Hoxton. The new model artisans' dwellings occupy the old Moira-place and Plumber's-place area. They are the first dwellings of the kind erected by any vestry or local board, and consist of three blocks of buildings, each five stories high, fronting on Britannia-street and Provost-street. They are capable of housing 400 persons in 25 tenements of two rooms each and 50 tenements of three rooms each. The County Council contributed half the expense of acquiring the area; but the cost of erecting the dwellings has been borne wholly by the vestry. The number of persons displaced was 533. It is proposed to erect a further block at the corner of Nile-street, which will accommodate 72 persons; so that the total for whom accommodation is provided is 472. The tenements are each quite self-contained. The electric light is installed, and will be supplied at an inclusive cost of 8d. per week for the two-room tenements and of 10d. per week for the three-room tenements. The rents to be charged will be 6s. 6d. and 8s. 6d. per week respectively. The total cost of the scheme is £22,917, and, after allowing for all outgoings, the rents will give a return of about 3½ per cent. Mr. Rowland Plumbe, F.R.I.B.A., was the architect, and Mr. J. Steed the builder.

The Metropolitan Tabernacle.—A hope had been entertained that the rebuilding of the Metropolitan Tabernacle would have been completed some months ago, but it was not realised, owing to the inability of the contractors (Messrs. Higgs and Hill, of South Lambeth) to obtain the great iron ribs on which the roof is to be carried. Though at the time the contract was entered into the firm concerned could not give any guarantee as to delivery within a specified period, they promised to forward the girders with as much expedition as possible; but the conditions of the iron trade prevented them from sending more than a portion of the whole. The contractors are only awaiting the placing of all the girders in position and the roofing-in of the building to finish the other branches of the work. These are now in an advanced stage. The two galleries that run round the building, with their separate staircases, are practically finished. The concrete bed on which the wooden flooring of the auditorium will rest has been laid; as much of the plastering as it has been possible to proceed with has been done, and, substantially, the whole of the woodwork has been prepared. Every precaution is being taken by the architects, Messrs. Searle and Hayes, of Ludgate Hill, against another fire. The flooring and staircases throughout the building have been built of concrete, and the roof will be made of the same material. Steel, also, is being substituted for wood, wherever practicable. It is hoped that, at the very latest, the building will be ready by June next. The entire cost of rebuilding the Tabernacle and the Lower Hall will be £44,576, of which all but £5,000 has been obtained. The congregation is pledged not to open the Tabernacle until it is absolutely free from debt, and the building committee, of which the Rev. T. Spurgeon is the chairman, and Mr. F. H. Ford the hon. secretary, appeal for the raising of the £5,000.

West Kirby.—The new public hall was formally opened on Monday. The hall buildings occcupy a site at the junction of Meols-drive with Bridge-road, and have a frontage of 148ft. The façade is of red Ruabon brick with brown terracotta dressings, and the design is of a Free Renaissance type. The entrance hall is 5ft. by 21ft. The assembly hall is flanked on both sides by corridors 6ft. 6in. wide, and measures 80ft. long and 50ft. wide, while on the first floor are side galleries over the corridors and a gallery over the entrance hall. The height of the hall from floor to ceiling is 39ft., and accommodation is provided for 1,200 persons. The stage is 50ft. by 24ft., and the proscenium opening is 24ft. by 20ft. Flies, gridiron, and other accessories are provided to enable theatrical performances to be given. Cloak-rooms, with lavatories, &c., are provided for ladies and gentlemen, and at the back of the stage are retiring and dressing rooms, lavatories, &c. To the hall a large café is attached, having refreshment-rooms on the ground and first floors, kitchen, serving-rooms, &c., while on the top floor is a room suitable for small meetings, rehearsals, &c., with ante-rooms attached. The buildings have been designed and carried out under the supervision of Mr. Herbert W. Keef, architect, of Liverpool and Hoylake, and erected by Mr. W. H. Forde, of Birkenhead.

* * *

The programme of meetings for the Royal Institute of British Architects has been slightly varied since it was published at the beginning of the season. Next Monday evening, the buildings of the Paris Exhibition not being advanced enough for M. Charles Lucas to complete his paper in time for Monday evening, the date fixed for its reading, Dr. Murray has kindly consented to read his paper on that evening, and M. Lucas will take the date originally allotted to Dr. Murray—viz., Dec. 18. The subject of the paper for January 22, left blank in the announcements already issued, is "The John Rylands Memorial Library, Manchester," by Mr. Basil Champneys, and that for April 23, "The Works of the late Sir Arthur Blomfield, A.R.A.," by Mr. A. E. Street.

In order to permit of street improvements to be carried out in Thornhill, the local authority applied to the Local Government Board for power to borrow £4,750 to defray the cost, together with £250 for a store, &c., in Savile-road, Savile Town. The central body sent down Mr. Tulloch, C.E., one of their inspectors, to hold an inquiry, and it took place on Tuesday. The proceedings were purely formal, for there was no opposition.

COMPETITIONS.

Fulham: Walham-green Baths.—This competition, in which Mr. Frank T. Baggallay was the assessor, has just been decided. Twenty-five designs were sent in, distinguished by numbers affixed by the clerk to the Fulham Baths Commissioners. The amount expended not to exceed £35,000, including fittings and architect's commission. The first premium was awarded to Mr. Harry Dighton Pearson, A.R.I.B.A., of Teddington; the second, of 75 guineas, to Mr. H. Druery, of Putney Hill; and the third to Mr. T. W. Aldwinckle, F.R.I.B.A., of Victoria-street, Westminster.

Wharfedale Infectious Diseases Hospital.—It is understood that Mr. E. J. Silcock, C.E., of Leeds, the assessor appointed by the district council, has sent in his report, and that the decision of the council will shortly be made.

CHIPS.

A receiving order has been granted in the case of George H. Chappell, of Leek, surveyor.

The Wetherby Guardians and Rural District Council have been informed that the umpires in the Boston Spa drainage arbitration have awarded Major Gascoyne £273; the umpire's costs are £78, and in addition there are the plaintiffs' and solicitors' costs, in all a probable total of £500.

New schools erected in connection with St. Andrew's Church, Whitmore Reans, were dedicated by the Bishop of Lichfield on Thursday afternoon in last week. They are to accommodate 620 children, and have cost £4,500.

The statement of the affairs of Mr. Geo. W. Ryall, quantity surveyor, George-street, Wolverhampton, a bankrupt, shows debts £285 and assets only £2 8s. 8d. He attributes his failure to bad trade and illness of his family.

The extensions and additions to the National (Tate) Gallery of British Art in Grosvenor-road, Pimlico, will be opened on Monday week, the 27th inst. Mr. Sidney R. J. Smith, F.R.I.B.A., is the architect, and Messrs. Higgs and Hill, of Crown Point Works, South Lambeth, are the builders. We illustrated the Gallery itself in our issue of March 17, 1893, and gave a plan of the enlarged building, including the extensions just completed, in that of May 12, 1899.

The Bishop of Exeter has fixed November 30 for the opening of the new Church of Emmanuel, in one of the most populous districts of Exeter. The foundation-stone was laid by General Sir Redvers Buller. The church has been built from plans by Mr. Harold Brakespear, A.R.I.B.A., of Corsham, selected in open competition, and was illustrated in our issue of July 22, 1898. The style is Early Perpendicular. The external walls are of Babbacombe stone, and those inside of Pocombe stone, with Bath stone dressings, The roofs are of pitch-pine, with plain red tiles, and the seating is of pitch-pine in nave, and of oak in chancel. The sole contractor is Mr. N. Pratt, of Clyst St. Mary, and Mr. T. Glanfield, of Exeter, is the clerk of works.

The Dean and Chapter of Carlisle Cathedral, having decided upon replacing the old clock with a better timekeeper, gave instructions to Messrs. W. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne, to erect a new clock from the plans of Lord Grimthorpe, which they have just completed, and will shortly erect the new town-hall clock for the Mayor and Corporation of Carlisle.

Mr. Alderman John Pethick, builder and contractor, of Plymouth, has been re-elected mayor of that borough. Mr. G. Davis, builder, has been re-elected chief magistrate of Dorchester, and is now serving for the fifth time; and at Okehampton the new mayor, Councillor R. Brealey, was for many years a large builder in London. Mr. John Bradshaw, Mayor of Gateshead, was born near Abergavenny, Mon., in 1840. In 1867 he went to Newcastle, and obtained employment as a journeyman mason. The following year he started business on his own account in Gateshead, and, becoming successful, found time to devote himself to municipal pursuits, having now occupied a seat on the town council for 22 years.

Major General Darley Crozier, R.E., an inspector under the Local Government Board, held an inquiry, in the Town Hall, Warrington, on Friday, respecting an application of the corporation for sanction to borrow £44,966 for purposes of electric lighting, and £9,336 for the provision of a central sanitary depot at Parr-street.

The Roman Catholic Church of St. Mary's, Moorfields, was closed on Sunday night as a place of public worship, and to-day the process of demolition will begin. The site has been sold for building purposes. The remains of the bishops buried in the vaults will be transferred to the churchyard of St. Edmund's College, Ware.

PROFESSIONAL AND TRADE SOCIETIES.

Architectural Section, Glasgow Philosophical Society.—The opening meeting of the Architectural Section of the Glasgow Philosophical Society was held on Monday evening. The president, Mr. A. Lindsay Miller, architect, was in the chair, and gave his presidential address. He congratulated the section on the excellent syllabus presented to them this year, as indicating great energy in the section. He took for his address the subject of "Architectural Notes on Fountains Abbey and Oxford." He gave a short historical notice of each of the places, and then by means of slides gave an illustration of the leading features of the Cistercian abbey, and also of the colleges of Oxford. In conclusion, he stated that Oxford still maintained the lead in those historical associations which lent such a charm to a city. There, on all sides, one was surrounded by the memory of great men, who in their day had helped to the making of our country either in war, science, literature, or art.

Royal Institute of British Architects.—The half-yearly progressive examination of the R.I.B.A., London, was held under the direction of the York Architectural Society, at the School of Science and Art, on Tuesday, Wednesday, and Thursday last. For the first, or "Preliminary," stage 13 candidates attended, and for the "Intermediate" seven. The following members of the York Society officiated as examiners and moderators:—Mr. Henry Perkin, F.R.I.B.A., Mr. William Hepper, F.R.I.B.A., Mr. George Benson, A.R.I.B.A., Mr. A. W. Turner, Mr. J. T. Pegge, Mr. George Milburn, Mr. Jno. Ferguson, Mr. E. A. Pollard, and Mr. A. B. Burleigh.

Sheffield Society of Architects and Surveyors.—The first monthly meeting of this society was held at the School of Art, Sheffield, on Tuesday night. The president, Mr. Joseph Smith, was in the chair. On the proposal of Mr. C. J. Innocent, seconded by Mr. C. Hadfield, and supported by Mr. Fred Fowler, it was resolved to send a letter of sympathy and condolence to the family of the late Mr. T. J. Flockton, who was the first president of the Society. Mr. J. R. Wigfull, A.R I.B.A., then gave a lecture descriptive of "Some old Derbyshire Houses." He began by drawing attention to the large number of examples of old domestic architecture to be found in the close neighbourhood of Sheffield, showing traces of a great variety of styles included in the term English Renaissance. They were interesting as instances of the honest use of local material, and simplicity of treatment. Much could be learned from these houses, and he urged upon students the desirability of measuring and sketching the best of them. For the purpose of comparison the buildings in the district lying to the west of the railway between Totley and Udstone were selected and described. The lecturer remarked that they could all be visited in the course of a day's walk. By means of a map the relative positions of the various buildings were shown. Commencing with Woodthorpe Hall, an excellent example of the simpler houses of the 17th century, the lecturer drew attention in turn to Fanshawe-gate, Horsley-gate, Unthank, and Barlow Woodseats, the latter a large and interesting example, and one having some old farm buildings which present features worthy of notice. Cartledge Hall, with its wealth of oak panelling and ornamental ceilings, came in for rather detailed description. Reference was then made to Holmesfield Hall, at one time the residence of the Burton family. Here the very handsome doorway, with its elaborate heraldic shield, was described. Attention was also drawn to the oak panelling and plaster work to be found in the inside of the house. Dronfield Woodhouse, where there are traces of an old English garden, was then mentioned, and many old houses in Dronfield were described. The old Hall at Unstone, perhaps one of the finest examples in the neighbourhood, formed the last in the series. The lecture was illustrated by means of photographs and measured drawings of the buildings described. At the close the lecturer was heartily thanked, on the motion of Mr. Hadfield, seconded by Mr. Gibbs, and supported by Messrs. F. Fowler, Patterson, T. Winder, and others.

Extensive alterations are now being carried on at the Queen's Engineering Works, Bedford, for Messrs. W. H. Allen, Son, and Co. Mr. George P. Allen, of 3, New Inn, Strand, is the architect.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

"BUILDING NEWS" DIRECTORY, 1900.

All entries for the above for 1900 *must* reach us by December 1. The charge is £1 per annum prepaid for each entry. Very little space is available for 1900, and no present entries can be continued, or space for fresh ones guaranteed, which are not remitted for by December 1.

It is particularly requested that this notice may be heeded by readers interested. *It will not appear again.* Last year considerable disappointment was experienced by many who omitted to send their instructions in time. The space at the disposal of the "Directory" is strictly limited, and it is impossible to accept entries for the ensuing year after December 1.

Received.—W. H. S. and Son.—C. Z.—L. and N.—R.I.B.A.—Quiz.—Auctioneer.—L. T. M.—B. and B.—T. and M.—J. M. D.—F. M. Harvey.—Beleaguered.—F. M.—T. P. and Co.—T. P. L.—H. H.—M.

Pupil.—Not unreasonable.

Competitor.—We have not seen the conditions; but if you are correct, it looks like a put-up job!

Metallic.—You must have a metal frame of some sort if it is to be movable. Why bed the tiles in plaster at all?

Perplexed.—You are right, we think; but the others will probably have their way. Organ makers seem as a rule rather to prefer to work independently of the architect.

H. and H.—Have you read the practical series on "Inlaying," now appearing in the *English Mechanic*?

Hotel.—Farrow and Jackson, 16, Great Tower-street, make all you want in the way of bar-fittings, cellar-lifts, &c.

Hopeful.—A roof of wooden shingles.

Correspondence.

RE COMPETITION, LYMM.

To the Editor of the Building News.

Sir,—It may be of interest to your numerous readers to be informed of the curious ideas evidently held by the promoters of the above competition. Having made personal application, as per advertisement, for a plan of the site, levels, &c., I was calmly informed that applicants must make their own copies of the plan shown to them, and, most astounding fact of all, must go out and purchase their own tracing-paper for the purpose!

The "instructions" (?) consisted solely of a list of rooms drawn upon a half-sheet of notepaper; these also must be copied for one's self! Add to this the conditions as advertised, and I think you have a very striking commentary on the dignity (!) of an architect's calling.—I am, &c.,

Manchester, Nov. 13. Victim.

Intercommunication.

QUESTIONS.

[11367.]—**Fireproof Building.**—Roman builders used concrete floors and flat concrete roofs without any wood or ironwork. Would such a form of fireproof building do for small village hospital, say a cottage with two floors and a flat roof? What would be the comparative expense between this and a cottage roofed with slates and with wood or iron floors? Would the accumulation of snow be a serious obstacle to the adoption of a flat roof? Why is the use of concrete so neglected in England, and what are the ascertained drawbacks to its more extended use?—Medical Roman Antiquity.

[11368.]—**The Tower of London.**—A building of large proportions, constructed of brick and stone, is being erected within the Tower precincts. It is utterly out of keeping with the surroundings, and well-nigh ruins a considerable portion of one of England's most interesting historical monuments. Can readers inform me who is responsible for this gross vandalism, or if any steps are being taken with a view to having this structure removed?—Architect.

[11369.]—**Rusting of Water-Pipes.**—A friend of mine in South Africa obtains his water supply for drinking purposes through iron water-pipes of small bore, which have become seriously rusted. He is going to have them taken up and the rust scraped out, and wishes to know of the most efficient way of preventing any future rusting. Would iron oxide paint be suitable, or some mixture based on coal-tar? Heat can be obtained if it is necessary for the application of the latter. Any advice or recipes would be very acceptable by—Small-bore.

REPLIES.

[11363.]—**F.I.A.S.** means Fellow of Actuaries' Society; there is no such Society or Institute belonging to the architectural profession. Some would-be qualified architects use it after their names in places beside South London. I do not know why, unless to pose as equals to F.R.I.B.A.—D. F.

[11363.]—**F.I.A.S.**—These letters stand for "Fellow of the Institute of Architects and Surveyors." This "institute" is, in reality, a Limited Liability Co., and any person (no matter who) by paying the sum of 10s. per annum becomes an Associate, with the letters A.I.A.S., and, for a further sum of 10s. per annum, he has the great privilege (?) of becoming a Fellow. The Royal Institute and the Society of Architects are the only two recognised professional bodies.—A.R.I.B.A.

[11364.]—**Wet or Dry Meters.**—Sharp frosts are liable to affect wet meters, but a little glycerine in the water retards this; otherwise they are much the same as dry ones, except the bother of looking after supply of water.—Regent's Park.

[11365.]—**Underpinning.**—Measure as if of the ordinary thickness and a percentage added to the abstract before billing. If brickwork is in small quantities to underpinning state it, and keep separate. Also state if it includes iron wedges, or any timber left in. Describe filling of old work as in small quantities inserted. See "Quantity Surveying," by J. Leaning. Spons and Co., Strand, W.C.—Regent's Park.

The Surrey County Council, having applied to the Local Government Board for consent to borrow £71,270, for purposes of the County Lunatic Asylum at Brookwood, an inquiry was held by one of their inspectors, Major-General H. D. Crozier, R E., in the Grand Jury-room at the County Hall, Kingston-on-Thames, last week. It was stated by Mr. F. G. Howell, the county surveyor, who exhibited the plans, that the asylum now houses 1,239 inmates, and the additions now proposed would provide for 348 additional patients, 24 nurses, one medical officer, and about 20 male attendants, making about 400 in all.

The first official ceremony in Mr. Alderman Newton's mayoralty was performed on Saturday, when he opened Lloyd's-avenue, situated at the back of the Tilbury and Southend Railway Company's terminus in Fenchurch-street, and running through into Crutched Friars. It crosses the site lately occupied by the East and West India Docks warehouses, and is 440ft. in length and 40ft. wide; beneath is a subway 12ft. wide and 7ft. 6in. in height. The work has been carried out under the superintendence of Mr. D. J. Ross, the City engineer, by the Corporation, at a cost of about £12,700, towards which the chief property-owners in the district which it traverses have contributed £6,000. At the western side of the Fenchurch-street entrance, close to Aldgate, buildings are in course of erection for Lloyd's Shipping Corporation.

LEGAL INTELLIGENCE.

Property Arbitration in Leeds.—An arbitration in connection with the York-street Insanitary Area took place at the Leeds Town Hall last week, before Sir Hugh Owen, G.C.B., of the Local Government Board. The claimant was Mr. John Newton Sharp, and the property which the corporation desire to acquire from him for the purpose of their improvement scheme consists of a lodging-house, 8 and 9, Moxon's-yard, a stable, cart-shed, and yard off Moxon's-yard, and a store-room and coal-store at 11, Cross York-street, and 7, Moxon's-yard. The amount claimed was £1,050, and the corporation had offered £800. After evidence by Mr. Sharp and a tenant, Mr. Banks called Mr. Walter Hollis, auctioneer and valuer, whose valuation of the property was £1,195. Mr. Mosley, estate agent and valuer, put the value at £1,220. The evidence of Mr. D. Dodgson, architect, was to the effect that only about 20s. need be expended in repairs, and that by the tenants. No structural alterations were needed. The case for the corporation was then opened. Mr. J. M. Fawcett, valuer and surveyor, estimated the value at £684, and Mr. W. S. Braithwaite, architect and surveyor, at £719 19s. Mr. E. J. Silcock's valuation was £704. According to Mr. Charles Myers, builder and valuer, £10 was required for repairs. Counsel afterwards addressed the inspector, who adjourned the other cases entered to the 28th, 29th, and 30th inst.

Liability for Drainage Works.—Scott v. Ballard.—In this case, heard by Mr. Justice Wright on Saturday, without a jury, in the Queen's Bench Division, plaintiff was landlady and defendant lessee of the third part of certain stables and premises at No. 21, Corbet-court, Spitalfields. By covenant in the lease the defendant undertook to pay "all existing and future taxes, rates, assessments, and outgoings imposed in respect of said premises," to keep them in tenantable repair, and not to "do or commit or permit any waste or damage, or anything which might be or become a nuisance or annoyance to the owners or occupiers of adjoining premises." It appeared that a portion of the stables was defectively drained, and another portion, which had been converted by the defendant into stables, was not drained at all. In 1895 the sanitary inspector served a notice on the plaintiff requiring an abatement of the nuisance under the Public Health (London) Act, 1891. The plaintiff acted on this notice and incurred expenses of £150 15s. 6d. in altering the premises; but it appeared that only some £60 of this was incurred in drainage improvements, the other improvements being made on the suggestion of the sanitary inspector, but not under the notice. The plaintiff now brought her action for £150 15s. 6d. After argument, his Lordship held that the lessee was liable for the amount expended on the drainage works as an "outgoing" within the meaning of the covenant, but not for the further improvements, and judgment was entered for £60 and costs.

No Sympathy and No Costs.—At the Hanley County-court, on Friday, before Mr. H. Goldthorpe, deputy judge, Samuel Wilton, builder, Newcastle-under-Lyme, brought an action to recover from Thomas W. Twyford, manufacturer, of Whitmore Hall, and W. E. Stamer, estate agent, £40 13s. 10d, the balance of an account for work done. The case was remitted from the High Court, and Mr. Stamer was made a co-defendant by order of the District Registrar. Mr. Twyford took Whitmore Hall on a lease, one of the conditions being that Mr. Stamer, the agent for the estate, should do all that was necessary to put the place in tenantable condition. The plaintiff was engaged to do the work both for Mr. Stamer and Mr. Twyford. The account amounted to about £119. Mr. Twyford admitted liability for £56 and the agent for £26, and the question was who was responsible for the balance. Mr. Twyford said that he had not given instructions for the work to be done, and that it was part of the work Mr. Stamer ought to have done. The deputy judge, after hearing the evidence, gave a verdict for the plaintiff against Mr. Twyford with costs. He gave a verdict for Mr. Stamer, with whom, he stated, he had not the slightest sympathy. Mr. Stamer would have to pay his own costs.

Gasworks Buildings and the London Building Act.—Mr. Garrett gave an important decision on Tuesday at the South-Western Police-court on the Building Act on a summons which the London County Council issued against the Wandsworth and Putney Gas Company for unlawfully erecting a building which was within 20ft. of the highway. Mr. Daldy appeared for the Council, and the Gas Company was represented by Lord Robert Cecil, Q.C. The point was whether the common law overruled the private Acts of the Company. In this case the Gas Company were incorporated under three Acts, in one of which they were specifically "empowered to erect such buildings as they thought fit" on certain land scheduled in the Act. Accordingly, they had erected a new purifying house on the edge of their property, and within 20ft. of the centre of a highway. Mr. Daldy argued that, despite the private Act, the company were in the same position as a private landowner, and were amenable to the provisions of the London Building Act. Lord Robert Cecil contended that the private Act gave the company a specific exemption, and cited several decided cases in support of his contention. Witnesses were called to prove that it was absolutely necessary for the supply of gas that the purifiers should be erected, and they had been so erected on land mentioned in the schedule. Mr. Garrett, in giving his decision, said, in the first place, he found as a fact that the new building was necessary; and in the second that the company would be prejudiced in the supply of gas if they were not allowed to utilise the whole of their space. He was bound by the decided cases quoted by Lord Robert Cecil, and in face of these he dismissed the summons, and ordered the payment of £10 10s. costs.

New Mills Sewerage Works.—At the Chapel-en-le-Frith County-court on Monday, before His Honour Judge Smyley, Q.C., Mr. Rhodes, barrister, applied on behalf of the New Mills Urban District Council for a further extension of time in which to complete the contracts for carrying out the sewerage scheme of the district. Mr. Wilson appeared on behalf of the Mersey and Irwell Commissioners. Mr. Rhodes referred to the fact that a previous extension of time had been granted by His Honour till November 30. Owing to various unforeseen difficulties, and to a dispute between the contractors and the engineers, considerable delay had occurred, and had prevented an earlier completion of the scheme. Engineering difficulties had been met with also in one of the sections, and a heavy flood had washed away the contractors' plant in the river bed, where a portion of the mains were being laid and joined to other pipes through tunnels under the rocks. After a stoppage of some three months had taken place, by a mutual conference work had been resumed, and the most difficult section had been nearly finished. Coupling up with the mains to the outfall works was partially done. On the understanding that the council would proceed with all speed to finish the mains, couple up the houses, and commence filtration, his Honour granted time till July 31, 1900, to carry out the work.

Railway Compensation in Mile End-road.—A compensation case in connection with the purchase of the houses in the Mile End-road numbered 137 to 165 (odd numbers) was settled in the Under-Sheriff's Court on Thursday in last week. Mr. Cripps, Q.C., and Mr. A. Llewelyn Davis appeared for the claimant, Mr. Pearson; and Mr. Freeman for the defendants, the Whitechapel and Bow Railway Co. The case was settled at £19,000. The witnesses called were as follows: For the claimant—Mr. E. Tewson (Messrs. Debenham, Tewson, and Co.), Mr. Alfred Moore (Messrs. C. C. and T. Moore), and Mr. Robert T. Braithwaite (Messrs. Trist and Co.); and for the company—Mr. Daniel Watney (Messrs. Watney and Sons), Mr. Leslie Vigers (Messrs. Vigers), Mr. A. R. Stenning, Mr. G. A. Wilkinson, Mr. Samuel Walker, and Mr. Ryde.

Injunction against a Small-Pox Hospital.—The Earl of Jersey was the plaintiff in an action against the Hanwell Urban District Council, tried recently in the Chancery Division. Some years since the defendants' predecessors acquired land on the Osterley Park Estate for the purposes of disposing of sewage. The acreage taken not all being needed for this undertaking, in 1897 the defendants obtained an order of the Local Government Board empowering them to retain part of the land for a hospital for infectious disease patients other than those suffering from small-pox. The plaintiff objected to the property being so employed. Mr. Justice Kekewitch held that the local authority was not entitled to use the land for any other purpose than that for which it was originally acquired, and he granted the injunction asked for, with costs.

Building of a Roman Catholic Cathedral.—In the Queen's Bench Division at Dublin the case of "Joseph Colhoun v. the Rev. Bernard Macnamee and Others" came before the Court on Friday, on a motion by the plaintiff for a new trial. The plaintiff is a builder and architect, carrying on business in Londonderry, and the defendants are the surviving members who were appointed previous to 1892 to procure the erection of a Catholic cathedral in Omagh. A dispute arose as to the payment of a balance, and the action was tried in Londonderry and resulted in a verdict for the defendants. The plaintiff now sought to have a verdict and judgment entered for him for £840 or for £801, or in the alternative for a new trial. Plaintiff's case was that the defendants contracted in 1892 that he should build the edifice; that it was an implied term in the contract that he should receive instructions from the defendants; that they obstructed him and took possession of plant; that they were indebted to him for £3,214, and he claimed, in addition, £1,030 damages for failure to give him instructions, and £54 for the taking of the plant. The defendants denied the agreement as to instruction; they pleaded there was a term in it entitling them to take possession of the plant in the event of delay on the part of the plaintiff; that plaintiff did not complete the work; that the value of the work done to December, 1898, was £17,666; they paid £15,300 before action and lodged in Court £2,366. The Lord Chief Justice delivered judgment, and said the Court refused the plaintiff's motion with costs. As the architect's certificate was given for a sum which did not include the £500, the plaintiff could not recover it.

In re T. H. Cuckson, Sheffield.—A meeting of the creditors of Thomas Henry Cuckson, builder and contractor, of 144, Bradley-street, Crookes, was held on Friday at the offices of the Official Receiver (Mr. J. C. Clegg), Figtree-lane, Sheffield. The Official Receiver stated that, according to the statement of affairs, the debtor owed to unsecured creditors £1,379 13s. 10d., to creditors fully secured £1,856, and he estimated the value of their securities at £2,500. His assets, apart from those securities, he estimated to produce £500. The debtor attributed his failure to depreciation in the value of property, and to heavy law expenses. He commenced business about nine years ago in partnership with his brother, George Ernest. About five years ago an arrangement was made by them to pay 6s. 8d. in the pound, and since then the debtor had been carrying on largely with the assistance of his father, to whom practically the whole of the unsecured liability was due.

CHIPS.

The firm of C. and L. Ower, architects and civil engineers, Dundee, has been dissolved by mutual consent.

A meeting of the town trustees of Sheffield, was held on Monday evening, Sir Frederick Thorpe Mappin, town collector, presiding. The trustees passed a vote of condolence upon the death of Mr. C. J. Flockton, surveyor to the trust, and appointed in his stead Mr. Gibbs and Mr. C. B. Flockton as surveyors.

Messrs. Eyre and Spottiswoode, her Majesty's printers, have just opened a city office at 25, Leadenhall House, 101, Leadenhall-street, E.C. Their long experience in dealing with confidential documents, especially for the public service, will probably be found useful by city firms and companies in many branches of printing.

On Thursday in last week Col. Hepper, an inspector from the Local Government Board, held an inquiry at Frome into the application by the urban district council for the sanction of a loan of £800 for the purpose of street improvements in the upper part of the town.

A carved oak pulpit and canopy, with figures of SS. Peter, Paul, Augustin, Columba, Patrick, and David, has been erected in the parish church of Syston, near Leicester, as a memorial of her Majesty's long reign. The pulpit was designed by Mr. W. D. Caröe, F.R.I.B.A., of London, and carried out by Mr. A. Robinson, of Bloomsbury.

The business at the Mart, Tokenhouse-yard, last week, showed returns of £83,690; but of this sum £31,000 must be placed to the credit of the sale of gas shares. Not included in the above total is an amount of £22,850 obtained under the hammer for an estate of sixty-four houses and other premises at the East-end.

The Rev. S. Baring-Gould has been accepted by the Ecclesiastical Commissioners as honorary architect to the Moor Parsonage, at Postbridge. The plans are said to be almost ready for approbation.

The New York *Lumberman's Review* says the built-up board "is now being looked upon with favour by a group of capitalists who see in it a most durable and generally superior box board. It has been found that beech, birch, or maple cut into thin veneers and cemented together, three ply, the whole being about five-sixteenths of an inch, makes a very superior packing case. The chief advantages claimed for the built-up board are strength and lightness."

The dedication of two new bells and a new stained-glass window and the opening of a new vestry at the parish church of St. Peter, North-tawton, took place on Wednesday week. Mr. James Hooper, of Hatherleigh, was the architect, and Messrs. Fisher were the builders of the vestry, and also restored the tower at a further cost of £170. The new bells were cast by Messrs. Mears and Stainbank, of Whitechapel, and Mr. Harry Stokes, of Woodbury, rehung the existing peal and fixed the additions. The church is about to be reseated from the same architect's designs.

At a special meeting of the Otley Urban District Council on Tuesday night, it was decided to promote a Bill in Parliament to enable the council to acquire and purchase (by compulsion or agreement) the waters of Marsh Gill and its tributaries, in the township of Middleton, and also land for the purpose of constructing a reservoir to supply Otley with water. The scheme is estimated to cost £43,000.

WATER SUPPLY AND SANITARY MATTERS.

Bombay.—The Improvement Trust, appointed by the Government just a year since, has made important progress in carrying out its works. It has decided on executing almost simultaneously four schemes of reform, the aggregate estimate cost of which is about 1·85 crores of rupees. There has since been the delay necessary for preparing detailed estimates. Scheme I. is for the improvement by demolishment and reconstruction of a hotbed of disease—viz., First Nagpada District. This scheme has been elaborated and sanctioned, and now that the board has launched its loan successfully, contracts will soon be let and work commenced. Closely connected with this scheme is that of provision of house accommodation for the poorer and working classes dislodged owing to the demolishment of Nagpada, and this house accommodation will be provided before any houses are pulled down. This will not, however, prevent the board from at once acquiring the properties in this area. Fortunately, there is in Nagpada an open area sufficient for the erection of accommodation of 1,500 people, and in the neighbouring estate of Agripada blocks of buildings will be erected at once to accommodate 3,000 more. When these buildings are occupied, the destruction of Nagpada will proceed apace. In the mean time the inhabitants will be the tenants of the board. Schemes II. and III. of the board are for the construction of broad streets, one 80ft. wide and the other 60ft. wide, running from west to east through the back slums of the city with branch streets at right angles, the more thoroughly to open up those slums. These two schemes will probably be somewhat modified, though not in principle altered. Scheme IV. is for the opening up of an area at present unoccupied, and without roads or street, lying to the west of Scheme III., a very necessary operation, as many people of the middle classes will be evicted by Scheme III., and for them building sites are a necessity of the near future.

Laurencekirk, N.B. — The new water-supply works of Laurencekirk have been formally opened by Sir John Gladstone, Bart., of Fasque. A year since the scarcity of water in Laurencekirk became so great that the Burgh Commissioners instructed Mr. G. G. Jenkins, of Messrs. Jenkins and Marr, C.E., Aberdeen, to ascertain whether the existing supply could be increased. The engineer advised the commissioners—although it might be possible to augment the existing supply—to go to the Grampians for their supply. Mr. Jenkins's advise was acted upon, and instructions were given him to draft out a scheme, which was adopted, and has been proceeded with. The amount of water which is now running daily into Laurencekirk has been gauged at 135,000gals. The distance from the head of the source at Phesdo Hill to the reservoir is six miles, and the water is conveyed in iron pipes varying in diameter from 5in. to 7in. Mr. Alex. Tawse, Aberdeen, is the contractor, and the inspector of works was Mr. Robert Matthew, Aberdeen. The cost has been £3,500.

Marylebone.—In December last the Marylebone Vestry approached the London County Council with a view to an insanitary area in Nightingale-street and Samford-street being dealt with as a scheme under the Housing of the Working Classes Act, 1890. Nightingale-street is only 25ft. wide, and the population of the area is 620. The death rates calculated over the last eight years were over double that of the parish generally. The whole of the property is held on lease from the trustees of the Portman estate, of which it forms a part. The agent of Viscount Portman has promised that if the Council will pass the necessary resolution to enable the area to be dealt with, and acquire all the leasehold interests in the property, Lord Portman will repay the Council all its costs and expenses in so doing. It is proposed that the area shall be dealt with as follows:—Nightingale-street to be closed; the portion of the area adjoining the board school in Apland-street to be utilised as a joint playground for the school children and the children of the tenants of the dwellings to be erected on the remainder of the area; Lord Portman to provide dwellings in the area for as many persons as will be displaced. The nett cost to Lord Portman is estimated at £6,000, and the gross cost, which must in the first instance be paid by the Council, but will be repaid by Lord Portman, is £10,800. The proposals were adopted by the Council at their meeting on Tuesday.

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Damage to the extent of over £100,000 was caused on Tuesday by a fire which broke out at the north end of the docks, Bootle, Liverpool, and spread to neighbouring timber yards belonging to Messrs. Henry Quayle and Sons, to Messrs. Hattley, Hay, and Co., and the Liverpool Creosoting Co.

A Jubilee clock tower is about to be erected at Lewisham. It will be of stonework three stages in height, with a steep roof ending in a crown. Messrs. S. J. Jerrard and Sons, of Loampit Vale, Lewisham, are the contractors.

Our Office Table.

The General Purposes Committee informed the London County Council at Tuesday's meeting that they had received information that the premises No. 17, Fleet-street, facing Chancery-lane, commonly known as Wolsey's Palace, are about to be demolished and rebuilt, and it had been suggested that, in view of the historic interest attaching to the house, the Council should be asked to exercise its powers under the General Powers Act, 1898, of spending money in connection with buildings and places of historic or architectural interest, and, with a view to the preservation of the premises, to vote a sum of money for the purchase of the freehold. After investigating the matter, the committee found that the proposal would involve an expenditure of over £26,000, and, after allowing for recoupment by way of rent, which would be receivable by the Council, a charge would be left on the rates of a sum estimated to amount to an average of £115 a year. They did not think the Council would be justified in incurring this expenditure, and had accordingly decided to take no action in the matter. This recommendation gave rise to some discussion at the Council's meeting, and by 72 to 38 votes it was referred back for reconsideration.

The Highways Committee will bring before the London County Council on Tuesday next a proposal that powers should be sought in the London County Tramways Bill, to be promoted in the session of 1900, for the reconstruction for electrical traction of the portions of the Council's tramways between Westminster Bridge-road and Tooting and between Blackfriars Bridge and the tramways junction near the Horns public-house at Kennington. The line between Westminster and Tooting is six miles in length, and the cost of reconstruction is estimated at £191,400, while the length of the line between Blackfriars and Kennington is about two miles, and the estimated cost is £59,400, the estimate in each case including the cost of rolling-stock and a proportion of the cost of mains, plant, and power-house. Both of the lines are double throughout.

An important series of fire tests with floors, partitions, and doors took place on Wednesday afternoon at the British Fire Prevention Committee's testing station at Regent's Park. The French floors, partitions, and girder coverings, made of a material called "gypsine," were subjected to tests of an hour's duration, the temperature ranging as high as 1,800° Fahr., and followed by the application of water, the floors, of course, being loaded. Some oak and walnut doors were tested for 50 minutes at temperature up to 2,000 Fahr. The results of these tests will be issued in due course.

The beautiful building material known as Labrador spar is said to exist in boulders in the interior of New York State, and it is suggested by an American exchange that, instead of using it as an inlay, as Mr. T. G. Jackson employed it in the staircase of the Examination school at Oxford, it might be possible to obtain it in masses sufficiently large to be cut into columns. Since then, a granite has been quarried in New York State of mixed colours of black, green, and white, containing a considerable quantity of labradorite scattered through it in small crystalline masses, which glitter in the light with the characteristic bright blue sparkle of this beautiful mineral. The general colour of the granite is a dark green, not unlike that of Connemara marble, although more varied with white, and with brilliant sky-blue reflections from the crystals of labradorite.

At the Board of Trade on Wednesday Sir Courtenay Boyle presided over a conference of representatives of electric railway and electric tramway enterprises on the one hand and representatives of the Government interested in the Greenwich and Kew Observatories on the other. The object of the conference was to ascertain the best means of dealing with the alleged interference with the delicate instruments in the observatories by the leakage which it is assumed will follow from the introduction of large systems of electric traction. After Sir Courtenay Boyle had opened the proceedings, interesting speeches were delivered by Professor Rucker and the Astronomer Royal, who alleged that there must be magnetic disturbance; and by Sir Douglas Fox, Major Cardew, and others who would not admit that interference with observatory instruments had at present been proved. As a result, a committee was appointed "to investigate the amount of magnetic disturbance produced in the neighbourhood of electric tramways and railways constructed and worked under the Board of Trade regulations, and to report as early as possible." The committee consists of Professors Rucker, Ayrton, and Perry, representing the laboratories; Professor A. B. W. Kennedy, Mr. H. F. Parshall, Major Cardew, and Mr. Brousson, for the electric traction companies; and Mr. A. P. Trotter for the Board of Trade.

The new Building Code for the City of New York, which has been severely criticised by the architectural profession in the Eastern States, has been signed by the Mayor, and is now the law of New York. The provisions most criticised are those which allow the building commissioner to waive or modify almost any of the rules of the code. Even in regard to the bearing-power of soils, after specifying the maximum load to be placed on sand, gravel, clay, and other soils likely to be found in New York, the code says that the building commissioner shall have power to vary these restrictions; and most of the limitations of this kind fixed by the code may be nullified in the same way. There is, undoubtedly, something to be said in favour of giving a large discretion to building commissioners, to enable them to deal advantageously with the unforeseen conditions which are continually occurring in building operations; but, as the *American Architect* suggests, with a commissioner open to political or financial corruption, building methods in New York might become far more scandalous than they are now.

It has been discovered in Minnesota that lumbermen are securing some of the most valuable timber-land in the northern part of that State for almost nothing, and are doing it legitimately, too. During President Cleveland's administration he became interested in the matter of preserving the forests, and a number of large forest reservations were made by him, mostly in the West. On the lands thus reserved there were a good many settlers, and to compensate them for the loss of their lands they were given forestry scrip. Owners of this scrip could locate on land anywhere in the United States, whether surveyed or not, and it was the first scrip ever issued entitling its holder to locate on unsurveyed lands. By the purchase of this scrip, the lumbermen have entered upon the choicest of the pine-lands in the unsurveyed portions of the State, paying 2 dollars to 4 dollars per acre for land that is worth many times the larger sum. There is no way to prevent this, as the holders of the scrip are allowed to sell it, and the purchasers acquire the rights of those to whom it was issued. It is suggested that an appeal be made to Congress; but before that body can act the best part of the unsurveyed pine-lands will have been acquired by the timber-men.

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At the Bootle Town Hall on Tuesday a Local Government Board inquiry was held by Colonel C. H. Luard, R.E., with respect to an application made by the town council of Bootle for sanction to borrow £3,142 for the purchase of land for the improvement of Marsh-lane and for other purposes; £16,393 for purposes of electric lighting; £3,426 for purposes of public lighting; and £16,114 for works of street improvement.

The newly-created town council for Smethwick have at their first meeting appointed Mr. J. C. Fox-Allin, late surveyor to their predecessors, the urban district council, as borough surveyor at a salary of £350 a year.

Probate has been granted to the executrix and executors of the will of Mr. John Edward Wade, of Brantinghamthorpe, Yorkshire, and of Richard Wade, Sons, and Co., Ltd., timber merchants, of Kingston-upon-Hull, who died on September 26 last, aged 75 years. The gross value of the late Mr. Wade's estate has been entered at £199,353, including personal estate of the net value of £111,653.

At Tuesday's meeting of the London County Council a motion by Sir A. Arnold in favour of abandoning, in view of the heavy financial engagements of the Council, the projected Rotherhithe tunnel, was rejected, after discussion, by 74 to 41 votes.

A committee of the Chelmsford Rural District Council are considering plans and estimates of Messrs. John Taylor, Sons, and Santo Crimp for the draining and sewering of Writtle, and also for a water supply for the same parish, the total estimate being about £7,000.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. "Excavations in Cyprus in 1896," by Dr. A. S. Murray, F.S.A. 8 p.m.
Society of Arts. "Art Enamelling upon Metals," Cantor Lecture No. 1, by H. Hardinge Cunynghame. 8 p m.
Leeds and Yorkshire Architectural Society. Address by the President, W. Carby Hall. 6.30 p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Waterloo and City Railway and its Electrical Equipment." 8 p.m.
Architectural Association of Ireland. "The Round Towers of Ireland," by Anthony Scott, M.S.A., Drogheda. Grosvenor Hotel, Dublin. 8 p.m.

WEDNESDAY.—Society of Arts. "National Forestry," by D. E. Hutchins, Conservator of Forests, Cape Town. 8 p.m.
Edinburgh Architectural Society. Debate on "The R.I.B.A." 8 p.m.

THURSDAY.—Society of Architects. Inaugural Address by T. Walter L. Emden, J.P., L.C.C., President, St. James's Hall, Piccadilly. 8 p.m.
Society of Arts. "Old and New Colombo," by John Ferguson. 4.30 p.m.

FRIDAY.—Architectural Association.—"Art as Applied to the Weaving and Printing of Textile Fabrics," by Sir Thomas Wardle. 7.30 p.m.
Birmingham Architectural Association. "Constructional Faience and Ceramic Mural Decoration," by J. Miller Carr. 6 45 p.m.
Glasgow Architectural Craftsmen's Society. "Glasgow Building Regulations," by R. W. Horn, A.R.I.B.A. 8 p.m.

THE ARCHITECTURAL ASSOCIATION. NOVEMBER 24th — ORDINARY GENERAL MEETING at 9, Conduit-street, W., 7.30 p.m. Paper by SIR THOS. WARDLE on "Art as applied to the Weaving and Printing of Textile Fabrics," illustrated by lantern views.

G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

CHIPS.

The draft order of the Light Railway Commissioners, authorising the construction of a light railway-line from Kessingland to Lowestoft, has been issued.

The Ipswich Town Council have authorised the Parliamentary Bill Committee to take necessary steps for completing the purchase of the tramways.

Messrs. Braithwaite and Kirk, iron manufacturers, Swan Village, West Bromwich, have just accepted a large order from the Indian Government. It is to construct fifteen bridges, the estimated cost of which is between £70,000 and £80,000.

Mr. William Rathbone has accepted the invitation of the committee of the Liverpool Reform Club to unveil the Gladstone marble bust (executed by Mr. H. C. Fehr) on Monday, the 4th December next.

At Goodleigh, Devon, on Thursday week, Archdeacon Seymour dedicated a reredos as a memorial of the late Mrs. Jarratt's connection with the parish church. The reredos, which harmonises with the choir stalls, is of oak, and was designed by Mr. A. R. Jarratt. To the central panel is affixed a memorial brass, prepared by Messrs. Wippell, of Exeter.

To-morrow (Saturday) afternoon, the Right Hon. A. Akers-Douglas, First Commissioner of Works, is to visit Nuneaton to inspect the new Conservative Club, which has cost between £7,000 and £8,000.

At Watkins, New York, water is now sold by the cubic foot, instead of by the gallon. The rates are thirty cents per 100 for the first thousand feet, twenty cents per 100 for the second thousand, ten cents per 100 for the third, and seven cents per 100 for each additional thousand. These rates make the water a little more expensive to the largest consumers.

Colonel A. G. Durnford, R.E., has held an inquiry into the application of the Hebburn Urban District Council for sanction to borrow £4,223 for private street improvement works, and £550 for the purpose of public works and pleasure grounds.

An important street improvement is being carried out by the Bristol Corporation at the corner of Queen's-row and Park-place, Clifton. Upon the site thus cleared new business premises are being erected from plans by Mr. H. Dare Bryan, of College-green, Bristol. It is Late Renaissance in style, and two stories in height above the shops, with a square tower, finished with an open balustrade at the junction of the streets. The facing material is local freestone.

The foundation-stone of the new hospital and Nurses' Home at Frome, a part of the local commemoration scheme of the Queen's Jubilee, was laid by the Hon. Mrs. Duckworth on Friday. The building will cost about £5,000.

Trade News.

WAGES MOVEMENTS.

THE SKILLED LABOUR MARKET.—The monthly memorandum prepared by the Labour Department of the Board of Trade states that during October the general state of employment has been very good. In the trade-unions making returns, the proportion of unemployed at the end of the month was 2·3 per cent., compared with 2·4 per cent. in September and 2·5 per cent. in October, 1898. Employment in the building trades has continued good. The percentage of unemployed union members among carpenters and plumbers at the end of October was 1·1, compared with 1·3 in September, and 0 9 per cent. in October, 1898. In the furnishing trades employment has remained steady, the percentage of unemployed union members at the end of October being 2·3, compared with 2 1 in September. The percentage in October, 1898, was 1·6.

LEEDS: AMICABLE SETTLEMENT.—The differences existing between the Leeds Master Builders' Association and the local branch of the London Order of Bricklayers have at last been satisfactorily adjusted. In May last the men applied for an advance of one penny an hour, which the masters refused to grant. Since then representatives of both sides have met in conference, but without arriving at any agreement, the men declining to accept an offer of 9½d. per hour, being an advance of one halfpenny. On the 9th inst., however, a deputation consisting of three members of the Order waited upon the committee of the Masters' Association at the Builders' Exchange Club, Duncan-street, and intimated their willingness to take the proffered increase. A deputation of three members of the Manchester Order of Bricklayers, who recently gave notice for a halfpenny advance, were also received, and it was resolved to accede to the request. The increased wages will be paid to the members of both orders from May 1st next. Both deputations also consented to abide by the 1896 rules. The meetings were presided over by Mr. W. H. Dews, President of the Builders' Association.

The first course of Cantor lectures at the Society of Arts will commence on Monday evening next, the 20th inst. The lecturer will be Mr. H. H. Cunynghame, and the subject, "Art Enamelling upon Metals." The lectures will be fully illustrated throughout by practical demonstrations. The syllabus includes a description of the various styles of enamelling—Cloissoné, Champlevé, Limoges enamels. A demonstration will be given of the method of executing enamels, including the preparation of the metal plate, and the enamels. The application of enamel to jewelry will form the subject of the last lecture.

Some months back the council of Rossall School gave instructions for the preparation of a model of the school, showing in detail the school buildings, the adjacent grounds and playing-fields, the sea-front, the master's garden, chapel, library, and lodges, together with a portion of the high road from Blackpool to Fleetwood. The model is upwards of 7ft. long, and represents every minute detail of the buildings and configuration of the ground. It has been prepared by Messrs. George Falkner and Sons, of Deansgate, Manchester, at whose offices it is now on exhibition.

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CHURCH BENCHES & PULPITS.
ESTIMATES GIVEN ON APPLICATION.

WM. OLIVER & SONS,
MAHOGANY, WAINSCOT, WALNUT, TEAK, VENEER, and FANCYWOOD MERCHANTS,
120, BUNHILL ROW, LONDON, E.C.
The most extensive Stock of every kind of Wood in Planks and Boards, dry and fit for immediate use.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	,,	9 0 0
Wrought-Iron Girder Plates	8 15 0	,,	9 15 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£14 10 0	...	£15 0 0
Best ditto	15 0 0	...	15 5 0

	Per ton.		Per ton.
Cast-Iron Columns	£9 0 0	to	£9 15 0
Cast-Iron Stanchions	9 0 0	,,	9 15 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 15 0	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	57½ p.c.
Water-Tubes	52½ ,,
Steam-Tubes	47½ ,,
Galvanised Gas-Tubes	42½ ,,
Galvanised Water-Tubes	37½ ,,
Galvanised Steam-Tubes	32½ ,,

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£30 10 0	to	£31 10 0
Do., Vieille Montagne	31 10 0	,,	32 15 0
Sheet Lead, 3lb. per sq. ft. super.	18 10 0	,,	18 12 6
Pig Lead, in 1cwt. pigs	17 0 0	,,	17 10 0
Lead Shot, in 28lb. bags	20 10 0	,,	21 10 0
Copper Sheets, sheathing and rods	95 15 0	,,	93 0 0
Copper, British Cake and Ingot	78 15 0	,,	79 5 0
Tin, Straits	137 0 0	,,	138 0 0
Do., English Ingots	143 0 0	,,	144 0 0
Spelter, Silesian	21 0 0	,,	21 2 6

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 10 0	,,	15 10 0
Quebec Pine, yellow	,, ...	5 5 0	,,	7 0 0
,, Oak	,, ...	4 10 0	,,	6 10 0
,, Birch	,, ...	2 15 0	,,	4 12 6
,, Elm	,, ...	5 0 0	,,	5 15 0
,, Ash	,, ...	4 5 0	,,	5 0 0
Dantsic and Memel Oak	,, ...	3 0 0	,,	4 10 0
Fir	,, ...	3 0 0	,,	4 0 0
Wainscot, Riga p. log	,, ...	3 10 0	,,	5 15 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 15 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 [illegible]	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£20 5 0	to	£27 0 0
,, 2nd	15 0 0	,,	17 10 0
,, 3rd	9 0 0	,,	11 0 0
Canada Spruce, 1st	9 0 0	,,	11 10 0
,, 2nd and 3rd	7 10 0	,,	9 0 0
New Brunswick	7 0 0	,,	8 10 0
Riga	9 0 0	,,	19 0 0
St. Petersburg	10 10 0	,,	17 0 0
Swedish	10 10 0	,,	17 10 0
Finland	9 10 0	,,	11 0 0
White Sea	12 5 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 10 0	,,	£0 15 0
2nd ditto	0 9 0	,,	0 11 0
Other qualities	0 4 6	,,	0 9 6
Staves, per standard M :—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£24 0 0	to	£24 10 0
Rapeseed, English pale	,, ...	25 5 0	,,	[illegible] 10 0
Do., brown	,, ...	24 0 0	,,	24 5 0
Cottonseed, refined	,, ...	17 15 0	,,	18 15 0
Olive, Spanish	,, ...	33 10 0	,,	34 10 0
Seal, pale	,, ...	20 0 0	,,	21 0 0
Cocoanut, Cochin	,, ...	29 10 0	,,	29 15 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	[illegible] 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	[illegible] 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

THE BUILDING NEWS
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A RECORD OF PROGRESS.

THE opening addresses of the professional bodies make interesting, though rather retrospective, reading. Each new president reviews the past, delights to dwell on the deeds of his predecessors, and endeavours to show progress in one direction or another. It is well and useful, too, sometimes, to take a retrospective view, if only to show the steps we have taken, and to see in what direction we are moving, or the trend of tendency of the day. Mr. William Emerson, in his opening address at the Royal Institute of British Architects, reviewed the past history of architecture, dwelling with pardonable pride on the advance made during the sixty-five years of the Institute's existence, though he did not recount all the influences nor the spurring effect of younger societies to which this advance is partly attributable. We still doubt if its policy is always directed to the larger interests of the profession. But this by the way. We turn with more interest to the remarks made by Mr. Emerson on the progress of architecture during the period referred to, and it was natural that in the last year but one of the century something should be said. Last week we dwelt on a paper dealing with the claims of Gothic and Renaissance read by Mr. Basil Champneys, in which any idea of a new style was repudiated. Mr. Emerson is more sanguine, and he thought that at the present moment we are in the course of an evolution in art that may in time result in a uniform national style. It is a reasonable conclusion that after a period of reproduction, a revival of Classic, a revival of Gothic, and a period of eclecticism, accompanied by a period of analysis, in which architects have been comparing and making deductions, there will be an approach to a more national expression of architecture. Both the revivals of the Classic and Gothic were doomed to pass away without any result, the first by subordinating modern requirements to a classical garb, the second by a similar desire to slavishly copy Middle Age precedents. Both these rivals arrested progress and thoughtful adaptation. As the author says, the principle in both was the reverse of that which actuated the sculptor-architects of the Italian Renaissance; they adopted antique methods and details, but pressed them into the service of their buildings, not permitting the antique to dominate. But both copyism and purism are steps in the evolution. Certain conditions have checked progress: one is the antagonism between the requirements of building legislation, utilitarian considerations of various kinds and æstheticism. When both these seemingly opposite tendencies are understood better, we may hope for improvement. Another, a reconciliation between the various trades and art crafts and the architect. When we see a better understanding between the crafts engaged in building and the designer, we may look forward to more real life and interest in our buildings. Mr. Emerson spoke of individualism being essential. This is doubtful. It too often means nothing more than the assertion of individual taste, and is contrary to the true evolution of style as shown us by every great period of art. Individualism is now rampant in all our principal streets; but we cannot say that it has helped us to form a national style. As Mr. J. MacVicar Anderson said, our rapidly-extending Greater London is certainly no indication of advance; rather the contrary. An improvement would, no doubt, follow the appointment of a Minister of Fine Arts, in controlling and directing the architecture of London.

We look to another equally important retrospect—of the practical side of the subject. At the Surveyors' Institution, the President, Mr. T. Miller Rickman, who bears an honoured name well known to all students of architecture, dealt with the profession of surveyor as it presents itself to the public. Mr. Rickman compared the past with the present state of the profession, and the comparison holds good with that of other professions. "The older generation of surveyors were confronted," he said, "at the outset of their career with difficulties of which the present race of surveyors knew nothing. They were without textbooks or formulated knowledge of any kind, and had to learn by the hard experience of facts and the penalties which attend upon mistakes or ignorance"—a description which agrees very much with the state of the young architect of half a century ago, except that his profession was an older one, and had a literature of its own. But in each case—there were no textbooks, no formulated experience upon which to depend. The student had to find out everything for himself of a practical kind. There were no ready formulæ on the strength of building materials, no books on any specialised branch of construction, though there were plenty of books on the Five Orders, on Classic architecture, such as that of Vitruvius, and one or two handbooks like those of Nicholson and Gwilt. The young surveyor, in like manner at that time, was without treatises on the various branches of surveying, which are now so numerous. Take those, for example, which the Surveyors' Institution Examinations refer to under their several classes of land surveying, building surveying, valuations, estates, forestry, &c. These subjects had to be learned from experience and study, the student had to pick up his knowledge mainly as an apprentice; he had no easy method, rules and tables, except, perhaps, Inwood's, and one or two other guides—no legal decisions on questions of practice. If we just glance at the variety of subjects, and the knowledge of law the surveyor is expected to bring to his task now, we shall see the development of a profession which has few rivals. Just take only one or two branches that were scarcely known or specialised early in the century, such as the assessment of sewage farms, cases under the Building Act, easements of light and air, street improvements, forestry, allotments, and small holdings, betterment, taxation, tithes, &c. When we consider the amount of knowledge of a general mathematical and legal character these subjects imply, we can form some idea of the progress made. Mr. Rickman refers more particularly to his own class of practice—that of a building surveyor—to the changes he has witnessed in methods of measurement, in materials and constructive details, in technical education of the workman, and his observations are weighty and just. It is needless here to dwell on the many important departures made in building construction during the review of this period—how one material after another has been introduced and developed. Here the building surveyor has to keep in touch with the architect and with the manufacturer; he has to take out quantities for buildings of very diverse kinds, in which hundreds of new systems, fittings, and apparatus have to be described and valued. The modern quantity surveyor is really a development of the last 60 years; the student who follows this branch has to become an expert in measurement, both of materials and workmanship, to be able to bring a knowledge of mathematics to various problems of construction, and to make himself acquainted with modern systems of construction and improved materials. Compared with these attainments, his predecessor's were indeed simple and limited. Look at the treatises on quantity surveying, which have to some extent made this branch almost a science in systematic measurement and method.

The equipment of the modern surveyor, both in his knowledge and instruments, is more perfect than that of his predecessor. Not only have methods of study become more exact, but a higher degree of specialisation has been attained in the subjects of his study. Land surveying is a much more exact and scientific study than it was when the railways gave an impetus to this branch of practice. The instruments employed are now perfect in their construction and adjustments. Numerous improvements have been made to the surveyor's kit, including improved levels, clinometers, theodolites (as the "Transit" form), all conducive to greater facility of use and accuracy of observation. If we compare the old land-surveying methods with the modern system it will be noticed how much has now to be learned. There is traverse surveying, contouring, improved methods of levelling, of triangulation, and of field bookwork.

Mr. Rickman, speaking of the change that has taken place in the trade, says: "Forty years ago the workman in the joiner's shop had to perform all the various operations with his own hands. Now these were done by machinery, and he was little else but a fitter and fixer." The same change is seen in other trades, in those of the bricklayer, the tiler, the slater, the plasterer, plumber, &c.; they have been restricted to a part only of their trade by the action of trade unionism, and by the introduction of substitutes for their work. The substitution of ornamental tilework, terracotta, and decorative plaster are instances. The introduction of machinery and mechanical appliances have restricted the joiner, and reduced him to a fitter and fixer; and in other trades it has reduced manual labour, as in the smith's and plumber's. The speaker's wish that the modern workmen would be animated by the old trade guild, who protected their crafts and aimed at perfection, might be profitably followed. Although the profession has progressed in some ways, the general standard of work had deteriorated. Why? The craftsman has "drifted away from his original relations to his work"; the employer of labour no longer gets his own material, and engages his own hands, but the commercial contractor brings his machinery and his men, and undertakes the work at a profit. This, as Mr. Rickman rightly says, is strict utilitarianism and commercialism, but not by any means favourable to the artistic development of any constructive craft. It is true that the present state of the skilled labour market gives cause for anxiety, and the president alludes to the report of the Technical Education Board of the L.C.C., a document we have lately referred to, where it is proved that the only nursery of the London artisan is the country workshop, and how few are the apprentices among the thousands of hands engaged by the large building firms in London. All these influences have been prejudicial to the workman, and have helped to crush the small builders and masters. The decline of the apprenticeship system has given impetus to the technical school; but we think with Mr. Rickman that it is doing at one end what the unions are bent on undoing at the other: one by teaching a variety of things to the young artisan, the other restricting labour.

The two subjects have a relation to each other. If we are to look forward to a truly national art, we must try to redress the relations subsisting between art and labour by bringing back if we can those conditions of art to the workman which once existed. So long as our buildings are designed by one class of men, who studied art as a profession, and carried out by another and a purely commercial system, there can be no common ground, certainly no progress.

◆

ESTIMATES.—XXXI.

CONSTRUCTIONAL IRONWORK (*continued*)—MISCELLANEOUS.

It is often convenient in approximate estimating to test the correctness of a detailed calculation, as, for example, the cost of iron flooring or iron roofs. This may be done by knowing what it cost per unit or per square of 100ft. for any description of work. When the estimator has no time to make a detailed calculation of the value of such an item as an iron trussed roof, he can at least get an approximate value by this means. These prices per unit may be obtained by discovering the cost per square of any sort of construction, such as a floor or a roof, knowing the actual cost of any example. A few items referring to roofs may be given here.

Iron roofs suitable for factory sheds, &c., not exceeding 25ft. span, including wrought-iron trusses, corrugated sheet covering, gutters, &c., measured on slope, have been valued at £6 per square. A similar roof, exceeding 25ft. span, but not above 50ft., costs about £6 10s. per square.

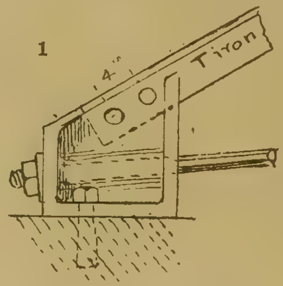
A superior iron roof, not exceeding 25ft. span, having wrought-iron trusses (king-post, tie and strut roof), with wood purlins, boarding, slating, and leadwork, is valued at £7 per square. One above this span, but not exceeding 50ft. span, with wrought-iron trusses and similar covering, is priced at £9 per square; and roofs exceeding 50ft. span, and not above 100ft., is priced at £15 per square. For spans of 150ft. the cost is about double the last. These prices are only approximate, and are rather low for the present rates of iron and labour, and would carry a percentage of 10 to 15 per cent.

In the pricing of many of the items we have given we have been obliged to assume the time it would take a smith to do certain work, as that is the only method of affixing a price to the labour. Of course, constants are useful, and may be employed, and they are based, as in those used in joiners' work, on the actual time a smith takes to perform a certain kind of work. Take, for example, such an item as that of riveting pieces of angle-iron on plate girders, or on tee-iron principals and struts. The amount or weight of iron is a subordinate factor to the labour, the punching or drilling the holes, the riveting, cutting, and fitting. Only an expert smith could say how long such an item would take, or what it was worth, and that is the reason why so many estimates and tenders for ironwork by contractors are unreliable. The estimator can only guess what time it takes a smith to forge the end of an iron strut, or the forked or flattened end of a tie-bar, and drill the holes for the bolts; it may be an hour, a day, or part of a day, and this can be expressed as a decimal. All holes for bolts and rivets should be punched or drilled in the yard; if drilled on the building they will cost 6d. each, and will not be so true.

In the calculation of bars and plates the weight per pound and its equivalent per cwt. is generally required. For this reason the estimator of ironwork would find it of value to have a table of equivalents ready to his hand, showing at a glance the price per cwt. or ton of wrought-iron or steel at any price per pound given. For example, 1d. per pound = 9s. 4d. per cwt.; 2d. per pound = 18s. 8d. per cwt.; 3d. per pound = 28s. per cwt.; 4d. per pound = 37s. 4d. per cwt., and so on, and these figures are of constant occurrence in pricing. Conversely, when we have obtained the price per cwt., the price per pound ought to be as quickly found. Such a table of equivalent prices, if accompanied by a table of weights for bars and plates per foot lineal or square, and for any section, would greatly facilitate the pricing of ironwork.

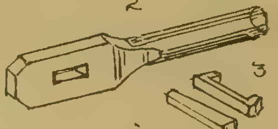
Our illustrations show two cast-iron shoes for iron trusses and connections of tie-rods, Figs. 1 and 4. No. 2 is a flattened-out tie-rod end with gib and cottar, and No. 5 shows plate-connections of principals and king-head, and also of the junction of king-strap and struts at the foot. In this case the struts and king are of flat bar-iron, all three thicknesses riveted together.

1



2

3



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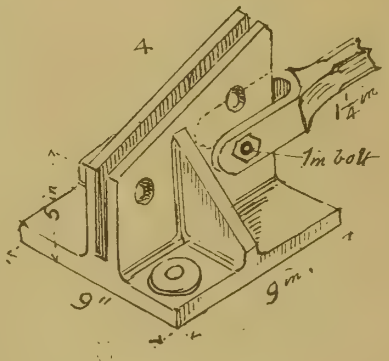

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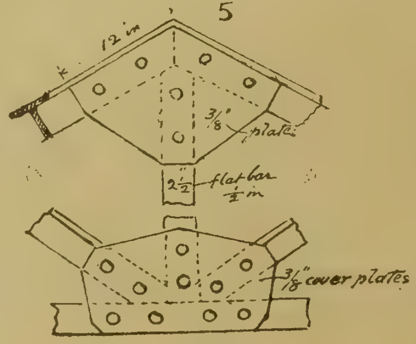


BOLT-HOLES, BOLTS, RIVETING, ETC.

No. 260. Bolt-holes for ½in. bolts drilled through ½in. iron.

These are possibly extra bolt-holes, as the holes and rivets are usually included in the price for rolled girders and roof-trusses. A steam drill would make these holes at 1d. or 2d. each.

13cwt. 19lb. in chimney-bars, and fixing.

These are charged at about 2½d. per lb., or 21s. per cwt., in Laxton, though much lower prices are put down. For ordinary bars, 12s. per cwt. would be sufficient. Fixing is generally included in the Bricklayer's bill, say, 1s. 3d. per cwt.

2cwt. 36lb. in ties and straps to floors and roofs.

These would be in the shape of rods and straps, and include screw-ends, nuts, bolts, &c. The item may be taken at 3½d. per lb. = 32s. 6d. per cwt.

1½ cwt. in screw-bolts and nuts, about 3lb. each average in timber trusses, partitions, flitch-beams, &c.

Put this item also down at 3½d. per lb., or if the bolts are 9in. long and upwards and ½in. in diameter, they may be priced at 24s. per cwt.

½ cwt. bolts and nuts, square heads, 3in. long, ⅜in. diameter.

About 28s. per cwt.

No. 152. ½in. screw-bolts, 8in. long, with heads, nuts, washers, and fixing in wood.

These are for wood framing, and are worth about 2½d. to 3d. per pound. The bolts would weigh about ¾lb. each.

	£	s.	d.
Say, cost of bolt	0	0	2½
Fixing, say	0	0	1½
Each	0	0	4

No. 16. ¾in. screw bolts 8in. long fixed to wood.

Bolts of this size will weigh about 1¼lb. each, including head, nut, and washer.

	£	s.	d.
Cost of bolt, say	0	0	4
Fixing	0	0	2
	0	0	6

No. 24. ¾in. screw bolts, heads, nuts, and washers to feet of principals 18in. long and fixing.

Bolts will weigh about 2½lb. each.

	£	s.	d.
Cost of bolt	0	0	6½
Fixing	0	0	6
	0	1	0½

No. 24. ¾in. screw bolts, &c., to queen-posts 20in. long, and fixing.

These would include boring the tie-beams and posts. Weight about 3lb.

	£	s.	d.
Cost of bolt	0	0	8
Boring and fixing	0	0	7
	0	1	3

2qr. 14lb. Round and pan-head rivets, ¼in. diameter.

These would be for riveting L-iron purlins to principals, and would be worth about 40s. per cwt.; ⅜in. rivets are priced at 35s. per cwt.

1¼cwt. Bolt-heads with hexagon nuts 9in. long, average, and ¾in. diameter.

These are worth about 18s. 9d. per cwt., according to one list.

No. 32. Pieces of angle-iron 4in. by 4in. by ½in., and 8in. long, bolted to girders.

Iron of this section weighs about 12·50lb. per lineal foot, and pieces 8in. long, two-thirds of a foot, would weigh about 8lb.

	£	s.	d.
Angle iron, 8lb. each, at, say, 1½d.	0	1	0
Cutting to length	0	0	6
Drilling two holes for ¾in. bolts, say 3d. each	0	0	6
Per bracket	0	2	0

IRON HANDRAIL, CORES, ETC.

60ft. run. 2in. by ½in. core-rail forged to shape of handrail, including screws, holes, &c.

This item probably includes ramped, wreathed, and circular work, as well as straight, let into groove in handrail. Averaging the straight with the curved parts, we can only approximately price this item.

	£	s.	d.
Say, cost of iron per foot run, 3¼lb. at 1½d.	0	0	5½
Labour per foot run, average, say	0	1	3
Boring holes and screwing	0	0	2
	0	1	10½

Say 2s. per foot run.

No. 62. 1in. bar-iron balusters, 2ft. 8in. long each, including tapping and screwing to wrought-iron core.

A bar inch square would weigh about 3¼lb. per foot run, at 1d. per lb. would be 3¼d., say, 3½d.

	£	s.	d.
Cost of bar, 2ft. 8in. long, say at 3½d. ...	0	0	9
Cutting bar to rake of stairs, say	0	0	8
Tapping and screwing ends	0	0	6
Fixing	0	0	6
Cost of each	0	2	5

Cutting 24 holes for ¾in. bar, drilled through inch wrought-iron rail.

These cost about 2d. each.

Tapping and screwing ends into rail ditto.

Price these at, say, 6d. each.

15ft. run. 4½in. half-round hand-rail scroll.

The weight of the iron will be about 2lb. per foot lineal, say—

	£	s.	d.
Cost of a foot run, at, say 3d. per lb., or 28s. per cwt.	0	0	6
Forging scroll, per foot, say	0	0	2
Fixing	0	0	3
	0	0	11

EXTRA LABOUR.

No. 8. Extra labour in iron tie-rods, broadening out for bolt-holes. (See sketch 2.)

	£	s.	d.
One hour of smith forging, say	0	1	0
Punching or drilling bolt-hole, &c.	0	0	9
Each end	0	1	9

No. 16. Extra labour in forming forked heads to ⅞in. suspension rods of queen trusses, as per detail.

If this is the usual forked end bolted through principal, the labour would be about worth 2s. each, punching or drilling holes for bolts 6d., though the cost will depend on circumstances and the kind of end.

No. 32. ⅜in. straps for connection of struts to principals, drilled for bolts and riveted to members. (See details.)

These would be flat pieces of strap iron about 6in. long and 3in. wide, and would weigh per foot lineal at ⅜in. about 3½lb.; 6in. would weigh half, 1¾lb.

	£	s.	d.
Cost of strap at 4d. per lb.	0	0	7
Drilling holes for bolt, say	0	0	4
Riveting to members, say	0	0	3
	0	1	2

⅝in. rivets should have a pitch or distance from centres of 3¾in. or 4in., and the rule is, the rivet pitch should not be less than six diameters of the rivet.

CASEMENTS AND SASHES.

No. 3. Side-hung casements 2ft. by 5ft., gunmetal fitted, with copper weather bars.

These are manufactured by the Crittall Manufacturing Co., Ltd., Braintree, and casements of this description of No. 1 quality are priced at 60s. each. This includes handle and copper weather-bar.

No. 3. Side-hung casements of malleable iron of above dimensions.

These are quoted at 32s. 6d. each.

(See price lists of the above and other well-known firms. Burt and Potts, Westminster; White and Son, Oxford-street, &c.)

No. 2. Wrought-iron sashes with mitre joints, 8ft. by 4in., 1¾in. thick, and with 16 panes.

These are of a superior kind, and may be priced at about 9½d. to 10d. per foot.

No. 1. Ditto, 10ft. by 5ft., with 25 panes.

Add another 1d. to the price given above.

CISTERNS AND TANKS.

No. 1. Galvanised iron cistern, 6ft. by 5ft. by 3ft. 4in., riveted cap, hoisting and fixing same on top floor.

No particulars are given as to thickness of plate. A cistern of this size would have to be at least ⅛in. thick.

	£	s.	d.
Cost of cistern, per list, including carriage	11	8	0
Add hoisting, say	0	1	6
Fixing	0	2	6
	11	12	0
Profit	1	3	6
	12	15	6

Provide and fix two 50-gallon 16-gauge galvanised iron cisterns supplied.

A cistern of this capacity would be about 2ft. 6in. by 1ft. 8in. by 2ft., and would cost at 16 W.G. £1 7s.

	£	s.	d.
Cistern delivered, say	1	7	0
Hoisting, &c.	0	1	0
Fixing	0	1	6
	1	9	6
10 per cent. profit	0	3	0
Cost, each	1	12	6

Braby's galvanised iron cisterns are made from 20 gallons to 1,000 gallons.

IRON DOORS, ETC.

Provide and fix one of Hobbs, Hart, and Co.'s wrought-iron "keyed rebated" party-wall doors, with hangers to slide on H-bars fixed to brickwork upon grooved rails, &c. Size of opening 6ft. by 7ft.

Obtain estimate from manufacturers. Sliding doors of ¼in. plate and ⅜in. stiles and rails, with wheels and running bars at top, channel-bar on floor, and of these dimensions are priced at about £13 15s.

	£	s.	d.
Say cost of doors	13	10	0
Getting in and fixing doors, including hoisting, cutting to brickwork, fixing, &c., say	1	10	0
	15	0	0

This is, of course, an approximate estimate, as the position of doors and fixing will vary.

Provide and fix one ditto 7ft. by 4ft. 6in., sliding doors opening with four panels, stiles and rails 3in. by ¼in., of ¼in. plate, with wrought-iron hangers, cast-iron wheels, and channel groove complete.

A wrought-iron plate door of this description would cost from £8 12s. to £9 15s. per pair. The L.C.C. regulations require "the floor jambs and head to be of brick, stone, or iron, and be closed by two wrought-iron doors ¼in. thick in the panel, at a distance from each other of full thickness of the wall, fitted to rebated frames without woodwork, or by wrought-iron sliding doors or shutters, fitted with grooved or rebated iron frames." (Section 77.)

The St. Pancras Ironwork Co. supply double hanging or folding iron doors, not exceeding 7ft. by 3ft. 6in., at £5 5s. each; if panelled both sides, £1 10s. extra.

No. 2. Sliding doors panelled on one side, ¼in. plate, with ½in. stiles and rails, edges planed, overhead rollers on a bar, channel iron frame at top, bolts complete, painted one coat, size of leaf 7ft. 6in. by 4ft.

	£	s.	d.
The St. Pancras Ironworks Co. make doors of this description, delivered in London at	10	12	6
Getting in and fixing, say	2	0	0
	12	12	6

No. 2. Double-hanging wrought-iron doors, ¼in. plate, ½in. stiles and rails, edges planed, with latch and bolt, rebated frame 3in. by 1in., painted complete, size 6ft. 6in. by 3ft. 6in.

These are priced in the same Company's list at about £8 16s. the pair.

Provide and fix Mason's patent stair treads to wood staircase, 20 steps, 4ft. wide.

	£	s.	d.
Roughly this would be 20 steps by 4ft. square = 80sq.ft., which priced at 3s. 6d, per foot	14	0	0
Fixing, say	0	15	0
	14	15	0

The best course is to obtain estimate, including fixing, for this.

THE SOCIETY OF ARCHITECTS.

THE second ordinary meeting for the present session of the Society of Architects was held at St. James's Hall, Piccadilly, last (Thursday) evening when the President, Mr. WALTER EMDEN, J.P., L.C.C., delivered the

OPENING ADDRESS.

I have been greatly honoured by your placing me in the Presidential chair of the Society for the third time in succession, and have to thank the members of the Society not only for the honour done me, but for the very unanimous way in which it has been conferred. Much has been done by the Society in the past year, which has been fully placed before you in the reports. The Council have given much time and attention to the carrying forward of the work which the Society has set itself to do, and undoubtedly Mr. Ellis Marsland, the hon. secretary, has again been to the front in its work. The appointment of the new secretary, Mr. McArthur Butler, has proved a very satisfactory one, and the secretarial work has also been greatly improved and systematised, and the Council and honorary secretary greatly assisted in their work. In drawing your attention again to the question of

REGISTRATION,

I would strongly impress its importance upon all members, particularly the provincial architects, whom it affects most, as they are most open to the competition of the incompetent and unqualified man. During the past year several meetings have been held to spread information on the question, and it is hoped with the increase of the subscription, to hold many more meetings than it has been possible to do in the past. These meetings enable the provincial architects to discuss the difficulty and advise and assist in finding the remedy when questions of importance arise affecting the profession. Though the progress may be slow, it seems to my mind it must undoubtedly come home to Parliament sooner or later (I hope sooner), that it is necessary the public should be protected from incompetent, uneducated, and ignorant persons who can and do enter the profession freely and without let or hindrance. Some interest during the past year has been shown in the law dealing with the

QUESTIONS OF LIGHT AND AIR,

and the alterations necessary to simplify it, and stay the present and ever-growing and wasteful expenditure. The particular difficulty in dealing with the matter is the fear, honestly or otherwise expressed, that it would interfere with the rights of property, but the proposals of the Society (and which I trust we shall take every opportunity of pressing upon the public attention and the Legislature) would not in any way interfere with the rights of property, but would rather help to protect them, while saving wasteful and useless expense, and the production, often enough, of disfigurement in our streets. The

LONDON GOVERNMENT ACT

of this year (1899) which was devised for the purpose of dividing London into cities or boroughs might well, as I suggested a year ago, have been made the vehicle for considerable improvement in the method and means of local government, by doing away with overlapping and the complications which at present exist. Our hopes in this direction have not been accomplished, but it is a direction in which much may be done by pressing upon the Legislature the necessity there is for codification of the Acts dealing with local government to produce more uniformity with regard to by-laws and requirements, &c., relating to buildings. One of the worst features of our English law is the number of Acts which are passed to amend almost every law; and it is therefore self-evident when large changes are made such as were made by this Act, that it is reasonable to take the opportunity of simplification and codification of existing acts. I do not mean to say the Government in no way simplified the matter by what it did; the Act certainly did something in this direction in congregating together a number of small authorities in one, so that over a larger district there would be uniformity. It left, however, the overlapping by the various authorities and the duplication of work for those engaged in building. The course which I think might fairly have been taken is that the municipalities should have had placed in their hands all the powers which were not absolutely necessary to remain in the hands of a central authority, for while believing in a congregation of boroughs like London, that it must be necessary to have a central authority, there should be left it as little executive work as possible, the actual administration being placed in the hands of the local authority. The central authority should make the by-laws and deal with such questions as main drainage, fire, water, metropolitan improvements, dwellings for the poorer classes, &c., which must be common to the whole of the Metropolis. Architects and surveyors will appreciate what I say when I state that the requirements with regard to building under the present system (or, rather, want of system) are complicated and overlapping, and that even while in a provincial city it is possible to pass one set of plans and go only to one authority, in London plans have to be deposited in almost unending succession and with several authorities. It must seem wonderful to those who understand the difficulties, that they are allowed to exist; but of course the many vested interests and the conservative feeling there always is with regard to existing institutions answers for much, while when legislation does come about, the Bills are more or less framed by men who have little or no practical or technical knowledge of the questions for which they draft the Act.

THE CODIFICATION OF BUILDING LAWS.

I think, therefore, for these and many other reasons, an extremely useful work on the part of the Society would be to try and bring about simplification and codification of the various Acts of Parliament affecting building operations. That there is considerable room for this to be done is evident, as I have stated, to every professional man and to every member of the public who undertakes a building operation; it would injure no one's legitimate interests; and while the professional man would deal with his work with less difficulty, the building public would obtain a great saving of expense. Following on these lines, the Council of the Society may well lay themselves out to study the new London Government Act with a view to suggesting from time to time, and to persist in attempting, to bringing about such transfer of powers and such rearrangement of duties as will simplify the practice which obtains in London with regard to building matters. Even if a thorough codification cannot be obtained, opportunity may serve to obtain minor improvements. I have before suggested the formation of a Technical Court as saving, in cases of light and air, delay, difficulty, and expense; but such a court might well go farther and be appointed to try at all events certain classes of building cases; the uncertainty with regard to decisions under the present method, as well as its delays, leaves it not only unsatisfactory, but encourages litigation, often enough for improper purposes. The Building Act Tribunal in London has, I think, proved itself very satisfactory so far, and in such technical work as questions of light and air it ought to be, as a technical body, admirably adapted to give just and equitable decisions, and when this is accomplished and has proved satisfactory, then with such modifications as may be necessary in its constitution, other classes of building cases might go to it. In the addresses which I have laid before you for the last two years, I have drawn attention to the

PRACTICAL WORK

done by and being done still by the Society; to go over it again would be merely to reiterate what has already been said. At the same time I feel quite confident that the work for the practical benefit of the profession and the public which has been undertaken will be followed up with energy and discretion in the future, more especially now that the action of the members has so much improved the Society's financial position, and the generous support given by country members has been extremely gratifying as showing the appreciation of the work of the Council as being at least as much in their interest as for those nearer the Metropolis. The number of country members on the Council speaks also for the interest taken in the work of the Society in the provinces. To recapitulate; at the head of the list of objects on which to set our attention comes the question of registration, and in reference to what is said by detractors, I think it would be more dignified on the Society's part not to take heed of the statement of even the President of the Royal Institute of British Architects, as not only was it incorrect in fact, if what we read was correctly transcribed, but it could only produce mutual recrimination between two bodies of professional men, which certainly should be avoided as being in the interests of none. I believe that registration is practically the head and centre of what is necessary for the protection of the public and the real elevation of the profession, and to obtain this must be always given our best endeavours. I think simplification and codification of the various Acts dealing with building matters, to produce uniformity all over the country, is also a work in which much good can be done, and is of the first importance, and as such I now urge it on the attention of the Society. The amending of the law dealing with rights of light and air, &c., is again a question of great importance, and while I do not dwell on it further, I consider that it should always be before the profession, and that every professional man should work for its accomplishment. These alone form a great programme, which, if faced, can, with patience, be accomplished, and its accomplishment will not only redound to the credit of the Society, but will be productive of many and valuable benefits to the public.

PROGRESS OF THE ARCHITECT DURING THIS CENTURY.

There is one aspect with regard to architectural work which it seems well to me I should touch upon at this date. We are now practically at the end of the 19th century, and, in fact, my term of office will be expended for the greater part in the first year of the 20th century. It seems, therefore, only right that I should look back, even if but shortly, at the advances which have been made in the work of the architect since the year 1800. Necessarily, a great deal of the advance comes, as it will do, in the train of increasing wealth, as without it the work done cannot be either as prolific, as good, or as carefully worked out, and there has been wealth at the command of the architect, as the country has vastly increased in wealth during the century. I believe that at no period of architecture was style and design so debased as in the latter part of the 18th and the beginning of the 19th century. The squares of London and the rows of houses in many districts which date from that period speak strongly in this direction with regard to our dwellings, and there are few great buildings of the period to which one could refer with pride. Certainly there was art still in some of the work —I rather refer to detail work—but even then it was poor and thin, and the general design of the interiors was often ill-considered and cold. One of the best examples of modern architecture, and, in my opinion, as a whole the best example, is the Law Courts of Brussels. I particularly consider these buildings good, because they are free from any tricks of art, and there is no attempt at over-ornamentation or of obtaining effect by it. It is the boldness and grouping which give its dignity to it, while the forcible nature of its design appeals to the thinking public to place it, as I believe they do, too, as one of the best buildings of the latter part of this century. But here in England we have also many buildings which speak well for the great advance which has been made, and it is found not only in many of our public buildings, but in our great hotels, town halls, theatres, and other buildings; even our shops, and certainly our private dwellings, have made great advances, and the plain wall, with holes in it, has almost ceased to exist. Indeed, I think there is a strong feeling in London (which has been growing since the days when the old Board of Works commenced its great work of the Thames Embankment), that it should not only be the greatest and the wealthiest of the cities of the world, but that it might also become one of the most beautiful. London has many advantages for such a claim; one is its river, another is the fact that the architect being free, and not hampered by the necessity of erecting great boulevards of similar elevation, produces buildings which, from the broken appearance they give when grouped together, produce a pleasing and picturesque effect, which adds much to the beauty of the city and is far more pleasing to the eye than a more regular style could be. The accommodation and luxuries of the small villas of today compares with the house of a similar class at the beginning of the 19th century so favourably that I have no doubt many who compare them wonder how their fathers or grandfathers ever lived in the way they did. The sanitary arrangements, baths, lighting, and a host of other attractions make the present villa a home which would have been envied could it have been seen or known of at the beginning of the century.

SANITARY PROGRESS.

In no century of English history have such great strides been made. Great Britain itself has grown into the greatest empire the world has ever known. Its wealth has grown with it, and it certainly would be strange if art and architecture had not also. I am pleased to think that not only has the decorative portion of the Architect's work made advances, but what is so much more material, the sanitary part of his work has also equally advanced. When we remember the many periods at which plague or cholera during the past century have attacked and threatened this country, it is certainly not only a relief, but a very great stride indeed, to know that practically the work of the sanitary authorities, and the advance in the science of sanitation, has almost closed the door to its recurrence, and to its consequent panic and fears, in the future. I do not mean to suggest that disease may not make some entry; but what I do suggest is, that it cannot spread broadcast over the country under the sanitary regulations and appliances which are now insisted upon. It will be even more effectually prevented when provincial regulations are made more in accordance with and more strictly administered with those of the towns and cities of the kingdom. No doubt, considerable advance has still to be made, and there is room for it in the near future; but what I am interested to show at the moment is, the vast difference there is for the better when we compare the state of this country so far as this part of the architect's work is concerned as it is now, with what it was in 1800. There is no doubt that during the same period invention and improvements have come upon us to such an enormous extent and with such rapidity that many things which would otherwise be considered great, are dwarfed and lost sight of; still but a little thought will show what strides sanitation has made. I trust, in the struggle for improvement, that the question of sanitation will always be kept well to the front, as whatever the wealth of the people, without health it is of little value. Let me, in conclusion, urge upon members of the profession, and of this Society in particular, that even if their influence or the time that they can devote to the elevation of architecture, and to deal with the questions which I have laid before them are small, it is still a material help; not only from the point of view that every little helps, but from the fact that it shows that all are taking an interest; and nothing gives encouragement to those who are devoting their best energies to the work, so much as to feel that all are taking this interest in it, and following and helping in the same direction.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Institute of Architects was held on Monday evening, the President, Mr. William Emerson, in the chair.

Mr. **Alexander Graham**, Hon. Sec., said he regretted to have to announce the decease of one of their distinguished colleagues, Sir Thomas N. Deane. He was a man of very high character, and as an architect did some excellent work in Dublin, and also in Oxford and London. He was not a member of their Institute, but was associated with the sister Institute of Architects in Ireland, and also a member of the Royal Hibernian Academy. His chief work was the Library and Museum at Dublin, on the opening of which he was knighted by the Queen. He was the architect of the remarkable Museum at Oxford, noteworthy in many ways, and especially as the work of one of the great architects who at that period came under the influence of Ruskin's teaching. In conjunction with his then partner, Mr. Woodward, he was one of the competitors for the Law Courts, and the beautiful design then submitted would be recalled by many members; he also competed for the Imperial Institute. He had also to report the death of Mr. F. J. Flockton, of Sheffield, who might be said to have rebuilt half that city, and certainly had left a great variety of works in Sheffield and the neighbourhood, of which he might specially allude to the Mappin Art Gallery. He had been a member of Council of the Institute.

EXCAVATIONS IN CYPRUS IN 1896.

A paper on this subject, illustrated by a few lantern-slides, and by photographs and drawings, was read by Dr. Alexander S. Murray, F.S.A., Keeper of the Greek and Roman Rooms in the British Museum. Mr. Murray opened his paper with a description of the site of the excavations. The district is best known to Classical students from the extensive ruins of the Græco-Roman city of Salamis which lie along the seashore. It had been thought that the lower strata contained remains of a much older settlement, which would confirm the tradition that a band of Greeks returning from the war of Troy had settled there and built a city, naming it after their native island of Salamis. But no such remains were found. More inland, however, were several underground tombs of construction peculiar to the Mycenæan age, such remains as might be expected of the original Greek colonists. As the settlers would have kept to the coast, the present inland situation of the remains was explained by the fact that an extensive tract of marshy land, through which the river Pediæos flows, had once been a fine bay, at the head of which on a rocky slope the Greek colony was established. Between this slope and the river, when Dr. Murray's party arrived, was a stretch of tilled fields worked by the people of a neighbouring village. On the face of the fields there was no sign whatever of ancient civilisation.

WHAT RESULTED FROM AN OX'S STUMBLE.

An accident led to important discoveries. An ox in ploughing put his foot into a hole. At night the ploughman returned to the spot, and found underneath a fine tomb of the Mycenæan period. The secret leaking out, Dr. Murray, who was just then starting for Cyprus, decided on further investigation, which resulted in the discovery of about 100 tombs, all of the Mycenæan age. This they claimed to be the burying ground of the original Greek settlers. Traces existed of previous rifling of the tombs in Roman and Mediæval days. Notwithstanding this, the objects in gold discovered almost equalled in quantity those obtained by Dr. Schliemann at Mycenæ, and were fully as important in quality; while the ivory carvings were of far greater value than his, and the pottery more abundant and of greater interest. The author dated them at about 800 B.C., or even a century earlier. Numerous objects were found which had been imported directly from Egypt, others from Phœnicia, exhibiting the mixture of Egyptian and Assyrian art for which the Phœnicians were famous, and others in which a purely Hellenic spirit was recognised, sometimes acting upon and modifying Oriental conceptions, at other times introducing entirely new conceptions as well as new technical resources.

THE ORIENTAL ORIGIN OF CYPRIOTE ART.

In the author's view, this new Hellenic element had reached Cyprus from the adjacent coast of Asia Minor, whence came the earliest Greek poetry, the earliest philosophy, the earliest painting. One of two reliefs on an ivory mirror handle represented a man slaying a gryphon—a familiar subject in Phœnician works, particularly among the antiquities found by Layard at Nineveh, dating about 800 B.C. The conception was obviously Assyrian in its origin; but there was also a breadth and style in the gryphon, and a keen sense of the creature's suffering, which was finer in observation than anything known in Assyrian or Egyptian art. The other relief was a lion attacking a bull—again a frequent conception in Phœnician art. But in no case was the conception worked out in the ingenious manner here displayed. The artistic power and the just observation of animal life exhibited in these reliefs were premonitory of Greek genius. An ivory casket was another example. Its lid was divided into squares for the game of draughts on the same principle as an Egyptian draughtboard; but the art of the reliefs on the sides was not Egyptian. It corresponded to what is known as Hittite art, the remains of which are found in Northern Asia and in Asia Minor. The prevailing element of the subject depicted was Assyrian; but on to that was engrafted a certain rude observation of actual men and animals, unlike anything Assyrian. The dawn of a true Greek artistic spirit was also exhibited in some porcelain drinking vessels. One or two were prototypes of similar Greek vases of the 6th century B.C.

CYPRIOTE BRONZES.

Among the bronzes found were a pair of finely made greaves. As bronze greaves were not known in Homer's time, these antiquities were consequently later than the Homeric poems. A curious cubical bronze stand, showing on each of its four sides the heads of two women looking out of a window, seemed to be characteristically Palestinian, and might be taken as an illustration of the bronze stands or bases which Hiram made for King Solomon. On one part of the site were found bronze utensils, shovels, tongs, field instruments, the pans of a balance, and some bronze vases which had been crushed together as if ready for melting. A heavy ingot of bronze, such as was exported for melting purposes, pointed to these being the remains of a foundry. In one tomb were examples of pottery belonging apparently to the most primitive age side by side with the most developed stage of Mycenæan industry. These older shapes, the author concluded, had survived for the common purposes of daily life. The gold ornaments discovered consisted mostly of thin fillets or diadems on which designs were beaten out from moulds, the same mould being repeated over and over again on the same fillet. An Egyptian pectoral, inlaid with paste, of orange, blue, and white colour, and some gold fibulæ or peronæ, used by Greek women for fastening their dress on the shoulders, afforded additional evidence in support of the date the author assigned to the antiquities. A number of Egyptian scarabs were found, including one bearing the name of the Queen of Amenophis III. (*c.* 1450 B.C.), and another of the much later Orsokon dynasty of Egyptian kings, dating from the 9th-century B.C. Discussing the presence of these two scarabs in a set of tombs which, from their general contents, could not have covered a period of much more than a century, the author contended that they could not both be contemporary with the kings whose names they bore. It was a matter of history that Amenophis III. became a Greek hero under the name of Memnon, and scarabs bearing his name were reproduced in comparatively late times for export among the Greeks. Turning to the

DECORATIVE PATTERNS

painted on vases and beaten upon gold, these were interesting as carrying us back to the origins of industrial art in Greece. Nothing was more striking than to find representations of animal forms of the most extraordinary naturalism side by side with the most primitive exhibitions of decorative skill. There were illustrations of the cuttlefish, a favourite subject on pottery of the Mycenæan kind. To this day the cuttlefish is an article of food among the poorer people of Greece, and doubtless it was so in primitive times. Hence its being copied for decorative purposes. As, however, there was more of pattern than of naturalism in the form depicted, it was reasonable to suppose that a previous familiarity with spiral patterns evolved in technical processes had formed a basis of positive knowledge from which those early designers advanced towards the more speculative copying from nature. Discussing the spiral pattern on the gold ornaments and pottery, the author showed the difference in the treatment of this pattern on the oldest (Dipylon) pottery of Athens, and that on the Mycenæan specimens. Spiral patterns from among the many sculptured stones of Scotland were shown as evidence of the

COMMUNITY OF ARTISTIC INSTINCT

between the people of the Mycenæan age and the Celts of Europe—a point now becoming generally recognised, but which the author had been well abused for suggesting at the time of Dr. Schliemann's discovery. As far as the excavations showed, the goldsmith seemed more at home in plant life than the vase-painter. The rosette and the palmette were equally common. In one instance there was a double palmette of striking resemblance to a pattern hitherto supposed characteristic of Greek vases of the 6th century B.C. In another instance there was a complication of palmettes and spirals almost suggesting a Corinthian capital. There were constant suggestions of the Ionic capital, but no sign of the Doric. There was an excellent example of a guilloche pattern incised on an ivory vase. From the curious and almost bizarre blending of art revealed by the relics, the author inferred that the whole series belonged to a period when the Eastern Mediterranean was the scene of constant struggles for supremacy on sea among rival Greek or semi-Greek peoples. The results of the excavations, Dr. Murray added, will shortly be published by the British Museum in a book upon which he has been a good deal engaged since 1896, and some plates from which were exhibited.

Mr. J. L. Myres, Christ Church, Oxford, heartily congratulated Dr. Murray on the very important discoveries he had made in Cyprus, and on the able and thorough manner in which the excavations were carried out. Differences of opinion existed as to the date that should be assigned to the works discovered and described that evening; but it was manifest that whatever the exact period of execution, they partially filled the gap that had existed, so far as our knowledge went, between the period of Mycenæan civilisation and that of the earlier stages of Hellenic civilisation. The lecturer had shown that the Mycenæan artists in Cyprus had already come under the influence of Egyptian art, and that in the recent discoveries at Enkomi we saw a somewhat late prolongation of the Mycenæan age in the Levant. It was evident at that period the art of Egypt was influenced by Assyrian and Phœnician art, and we know that by then Mycenæan art had passed its bloom in the Ægean Sea. The great value of these excavations at Enkomi was that they had produced a mass of first-class materials for the study of the art transitional between that of Mycenæ and that of the Early Greeks. He proposed a vote of thanks to Dr. Murray.

Mr. Arthur H. Smith, of the British Museum, who brought the work to a conclusion after the return of Dr. Murray, described the site at Enkomi, remarking that this was one of the few areas of tombs which had not been recently rifled by natives in search for gold and other treasures. Indeed, its existence had not been suspected until the fortunate stumble of an ox through the crown of a tomb vault revealed its character.

Professor R. Elsey Smith, of King's College, in seconding the vote of thanks, said that the tombs at Paphos were all sunk in the ground, and some had doors of slabs of stone, and were approached by flights of steps, in one case by as many as twenty-four stairs. They saw three examples of built-up masonry tombs, such as Dr. Murray had found at Enkomi, nor did they discover any ornamental work, or find it so interesting as that which Dr. Murray had described to them. One of the articles disinterred at Paphos was a large fibula in the form of a dagger, cased in gold, and engraved; it was now in the British Museum.

Mr. Hugh Stannus criticised in detail the spiral ornament to be seen on some of the bronze ornaments, which he considered was derived from the art of the goldsmith. He compared the work generally with that which he had examined in the Schliemann Museum at Athens, and coincided in the opinion that Dr. Murray's finds helped to bridge over the interval between Schliemann's discoveries at Mycenæ and Early Greek art.

Mr. H. W. Brewer, Mr. Beresford Pite and Mr. W. Brindley joined in the discussion, and the President, in putting the vote of thanks, suggested that the work bore a marked resemblance to that of Egypt, the Hittites, and Assyrians, and might not all these have been derived from a much more ancient civilisation—that of India? He had seen work of similar character at Gwalior and Lahore, and as they found the Greek fret, the Ionic capital, and the guilloche in India, it might be that that country was the cradle not only of beliefs but of the ornamental arts.

Dr. Murray briefly replied to the vote of thanks, which was carried by acclamation.

WELDING RAILS BY ELECTRICITY.

It is an axiom in construction which, we have frequently observed, does not obtain that careful attention and consideration which ought to be paid to it that simplicity is perfection. In this sense, the word "construction" must be taken in its literal and correct meaning, which is that of building up or putting together. It is of no consequence what particular shape or form the constructed piece of work may ultimately assume when completed, or of what materials it may consist. Whether it be a bridge, a roof, a public building, a locomotive, or a marine engine, the object to be accomplished and the purpose to be achieved are identical in all cases. They include the putting together or building up of any compound structure by the intimate union, combination, and attachment of its component parts. Viewed from this standpoint, the practical significance of the axiom we have quoted is to the effect that the fewer the number of parts in any constructed work the better. The actual number of component parts required in any structure will depend in the main—partly upon the nature of the design, the number of joints or points of connection between the various parts, and also upon the general character of the workmanship. In all architectural and engineering works, it is not the multiplication and diffusion of stresses, or of material and number of parts, that is either needed or desirable; but rather the concentration and accurate location of the stresses in the most advantageous manner. At the same time, this principle of the concentration of loads and of consequent stresses must be restricted to certain limits, wide as is the latitude which is accorded to it.

The permanent way of an extensive and important line of railway, which brings us more immediately *en rapport* with the subject of our article, is one of the best examples which could be adduced of the imperative necessity of reducing the number of its component parts to a minimum. So far as the ballasting and the sleepers are concerned, there is little or nothing to be accomplished in this respect with them, nor would it be advisable to attempt any further curtailment in either the cubical contents of the former item or the number and dimensions of the latter. By far the heaviest proportion of the total cost of a permanent way consists of the sum expended upon the rails and the rail joints.

There are two principal methods which can be adopted for diminishing this expenditure. The one is to increase the length of the rails, and the other to decrease the number of the rail-joints. It will no doubt be at once remarked that an augmentation in the length of the rails will necessarily effect a corresponding reduction in the number of joints. Admitted; but there is a present limit to the length of a rail, which, for a time at any rate, will not be exceeded, and must, therefore, be accepted as the ordinary standard length. It therefore remains to call in the aid of the second method to further minimise the number of rail-joints, which now is under trial and forms the subject of our article. It must be borne in mind that the rail joints, in common with all joints in any description of constructive work, constitute the weak points in a railway track. They enormously increase the expenditure required for repairs and maintenance of the permanent way, and, in addition, have frequently proved to be the cause of serious accidents, entailing the payment of heavy damages by the company as compensation for injury to life and property. A very great deal has already been accomplished in augmenting the length of rails, and thereby to a certain extent reducing the number of rail-joints. In the early days of railways 16ft. was looked upon as a really long rail, and its weight was from 45lb. to 60lb. per yard. As locomotives engines became heavier, rails increased per yard run, both in length, size, and weight. The jumps, with respect to the first dimension, were 18ft., 21, 24, 27, and 30ft., and their maximum weight runs from 80lb. to 100lb. per yard.

But the increase in the length of the modern steel rail has only partially solved the problem, and the efforts of railway engineers have recently been directed to absolutely dispensing for long distances of track altogether with rail-joints. During recent years, there has been considerable discussion respecting the merits of the system of open joints between the rails, in comparison with that of complete continuity over long lengths of track. In order to test the matter, continuous rails with rigid joints, that is fixed end to end, have been laid with satisfactory results, for distances of two and three miles.

It is perfectly clear that the best process to adopt for making successive lengths of rails perfectly continuous, would be one which would solidly solder or weld together both ends of every rail to those of its neighbours, and this is the method now employed for effecting the purpose known as welding rails by electricity. It was discovered some little while ago, in conducting experiments, with the object of arriving at some conclusion on the question, that some slight modification occurred in the constitution of the steel of which the rail was made, which was at once, rightly or wrongly, attributed to the action of the electric current. Into the details of the process it is not our intention to enter; but the results of the trials carried out fully deserve notice, as it is obvious that the same mode of procedure would be equally valuable and efficacious in numerous other example of construction. Briefly, in welding the ends of the rails together, fish-plates of a plain bar section about 18in. in length are placed one on each side of the rail, and the whole joint amalgamated into one compact solid mass. It may be remarked here that in cooling the fish-plates contract and draw the ends of the two contiguous rails in so close a contact as to make the joint absolutely perfect. It was proved during these experiments that the application of a force of 160 tons failed to draw asunder a joint welded by this process. Some three years ago, 4,800ft. lineal of rail track were welded together in this manner in America, and more recently still, ten miles of line on the Morson electric railway at Brooklyn has been similarly made continuous. It is deserving of notice that only one fracture has taken place in every one hundred and eighty joints, which amounts to just one-half per cent. At present the Lorrain Steel Company are welding by electricity a hundred miles of track on the Buffalo Railway, of which fifty miles are laid with rails 61ft. in length. This method of forming the rail-joints is peculiarly well adapted for electrical lines, as it insures a thoroughly efficient conductor for the return current. It is evident that the electric welding of rails has passed the experimental stage, and may fairly take its position among other cognate mechanical and chemical processes.

T. C.

THE GOTHIC REVIVAL.

IN connection with the Arts and Crafts Exhibition Society, Mr. Halsey Ricardo delivered on Thursday evening in last week, at the New Gallery, Regent-street, a lecture on "The Gothic Revival." Mr. Ricardo pointed out that up to the 15th century architecture in England had progressed along the same general lines of growth without any great break. But with the Renaissance this orderly development was interrupted of Classicism. The Gothic revival of the present century, under Pugin, was a protest against the formalism of the Classical period; but in the Gothic Renaissance it was necessary to distinguish between mere whimsical, fantastic experiment, and the sincere effort of those who believed that a return to older and purer methods was the only salvation. It was the note of passionate sincerity which saved the works of a man like Pugin, while an Abbotsford only remained as a monument to the amiable whim of Sir Walter Scott. At first the real nature of Gothic art was not understood. The Gothic of the 13th century was full of religious enthusiasm, and the building of that time was simple, straightforward, and sincere, in spite of the wealth of detail and ornamentation which the craftsman wrought out of love of his work. The Gothic Renaissance had to work from the dome downwards, and to recall the thoughts and methods which were no longer really representative of the needs of society. Pugin was learned and gifted in a very high degree, but his work had no justification in modern life. The power of his influence lay in his passion. At this time a great burst of church building sprang up throughout the land, and with it a great burst of church restoration. But, unfortunately, the standard of that day was ignorant and narrow, and while forgeries of Gothic, more or less able, were being built, the original models were being defaced. Then awoke the voice of Ruskin to stir the conscience and intellect of the country. His influence on the Gothic Revival, though not quite understood at first, was incalculable. After referring to the work of Street, Burges, and Butterfield, Mr. Ricardo, in conclusion, said that the principles of Gothic art were unchangeable. We could not to-day match or reproduce the work of our forefathers with labour that was apathetic and mechanical instead of pleasurable and understanding. Architecture to-day must conform to the same conditions as when art meant sympathy and reverence, and had its roots struck deep in nature.

AGAINST HOWARD'S "GARDEN CITY."

IT is becoming daily plainer that the "housing problem" is ready to swallow up our nation. Lord Rosebery speaks of London as the "great appalling fact of these millions cast down, as it would appear by hazard, on the banks of this noble stream, working each in their own groove and their own cell, without regard or knowledge of each other, without heeding each other, without having the slightest idea how the other lives—the heedless casualty of unnumbered thousands of men. Sixty years ago a great Englishman, Cobbett, called it a wen. If it was a wen then, what is it now? A tumour, an elephantiasis sucking into its gorged system half the life and blood and bone of the rural districts"—1891.

Sir John Gorst, in the same year, suggested: "If they wanted a permanent remedy of the evil they must remove the cause; they must back the tide, and stop the migration of the people into the towns, and get the people back to the land." In the *Daily News*, Mr. Ben Tillet said: "Hands are hungry for toil, and lands are starving for labour." The work done at Shoreditch lately shows the rotten source of all the evil, in our ancestors letting the land become the property (practically, not legally) of a few thousand owners. Strictly, of course, there are no land owners. All the land is the crown's, but the tenants are become practically owners of England, and all those born therein. At Shoreditch £600,000 had to be paid for certain slums. When they were pulled down, the land they had occupied was valued somewhat under £100,000. Here was a loss of half a million to the ratepayers at once. The half-million goes into the pockets of the slum-lords. On the cleared areas the Council builds sanitary houses for 6,000 persons, at a cost of £326,000, or £150 per head. These are at once occupied, but not by the dispossessed slum-population, who must herd in the neighbouring streets, where a new slum at once grows.

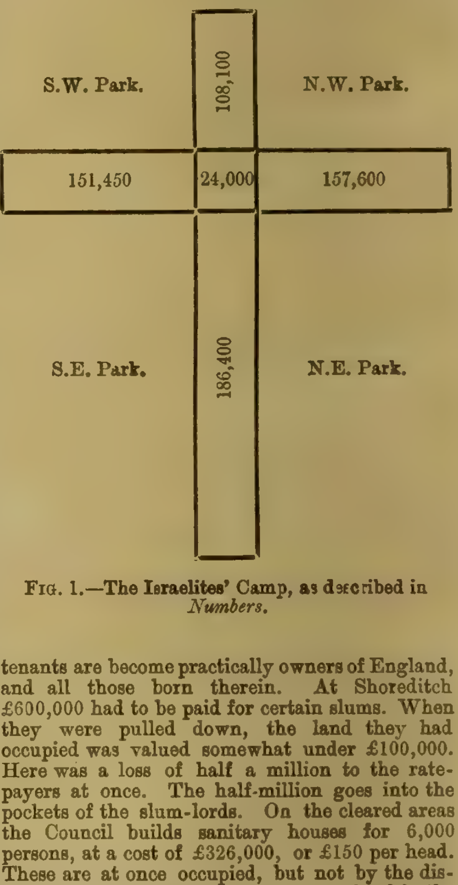
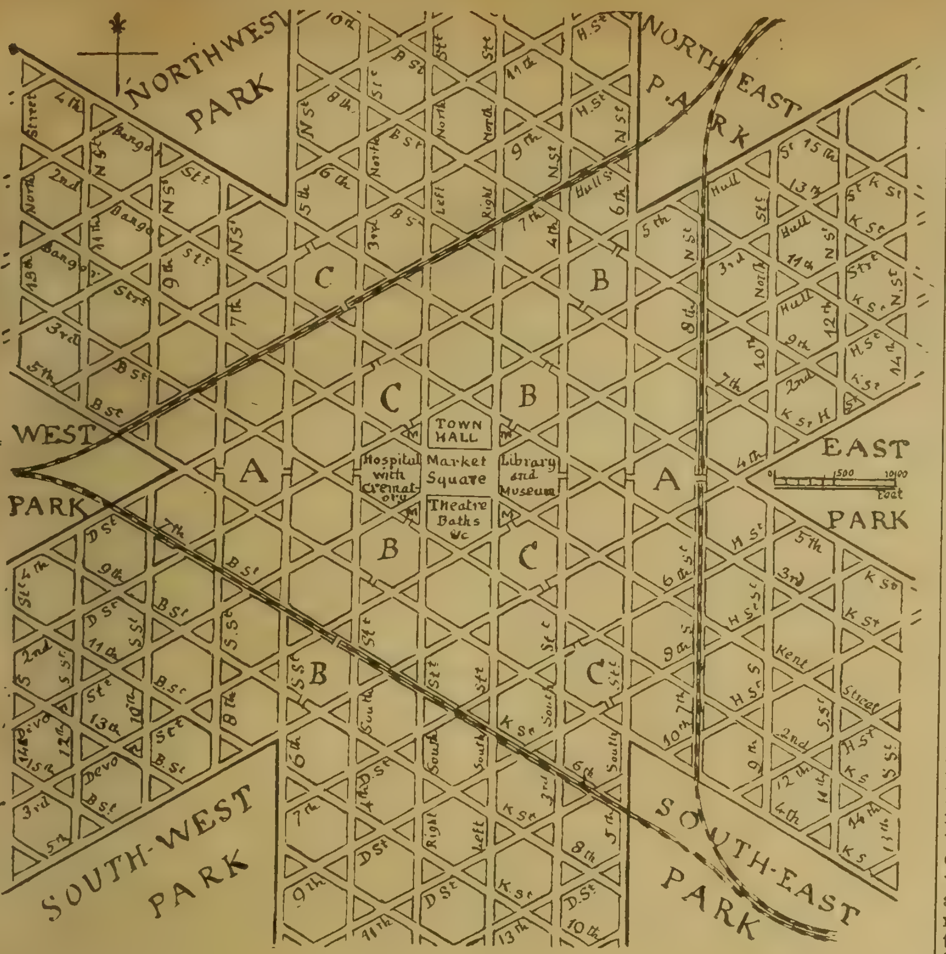


FIG. 1.—The Israelites' Camp, as described in *Numbers.*

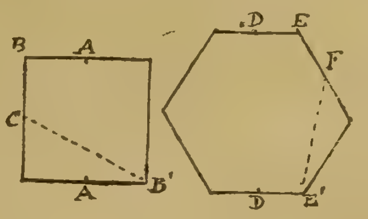
The late speeches of Lord Rosebery and Mr. Asquith hereon have been called "drawing red herrings across the path—very fine fat red herrings, but rather calculated to benefit the landlord than the slum-dweller."

The real remedy is suggested by Mr. Ebenezer Howard, in a book called "To-Morrow." The people have to purchase back some agricultural land, and found thereon a new city, or several cities, well planned initially; and to keep the land and all increasing value thereof in their own hands—that is to say their trustees' hands, to the permanent exclusion of all landlords. The first purchase must be with borrowed money, but so managed as to repay both principal and interest in 20 or 30 years. All this is set forth in the book "To-Morrow"; but the plans for what he terms a "garden city" are really for no *garden*-city, nor improvement on our worst existing towns.

The main source of his error is a superstition that cities must not be built for more than 32,000 inhabitants. Of course, the most densely inhabited parts of London or of Liverpool have the



highest death-rate. But this is a widely different thing from saying the most populous towns are least healthy. London, as a whole, has a much lower death-rate than Paris, or Liverpool, or Manchester, or Glasgow. But one of the oldest books yields a remarkable argument against this superstition. In the books of Exodus and Numbers, we read of Moses directing the Israelites in the Arabian desert to encamp in a temporary city that was set up in 42 places, during 40 years, for 625,550 people. Some expound it as 600,000 *families;* but I believe individuals only are meant, and that they never really approached that number, but were intended to have reached it. In the centre, around the Tabernacle, were 22,000 Levites, and the other twelve tribes were in four camps that spread in the form of a cross. The eastern camp accommodated 186,400, the southern 151,450, the western 108,100, the northern 157,600. Planning a square large enough for 24,000 (to allow room for the Tabernacle as well as the Levites) we may see the shape of the whole cross. Four high masts planted at the corners of the Levites' camp, all others were obliged to pitch so that they could see the two further masts between the two nearer. Thus it was easy for everyone to escape into the four external spaces that we might, in a modern city, call parks (Fig. 1). Now, in applying this to a new city, I would say the spreading might be allowed in six directions instead of four. This would specially suit the improved plan of street arrangement I advocate, wherein the streets cross never at right angles, but at angles of 60°. Mr. Howard's model city has only one point I would adopt. He has three straight thoroughfares running all through it. Now in keeping these, my object is to make *all* the streets straight thoroughfares (instead of only three) and all parallel with his first three. One of them he makes meridional, and the two others inclined 60° thereto, which I follow; so that no street may run east and west, nor any building have fronts looking due north or south, except those bounding my central square. The Italian saying, "Where the sun does not visit, the doctor does," is appropriate at least over the colder half of the globe, all places with higher latitude than 30°. For all these, I would avoid north fronts, which can get no sun during half the year. If our buildings were rectangular, they should turn their corners to the cardinal points; but as I would have them hexagonal they should turn a corner northward, and both the northward sides have then, in an English latitude, sun every day except in December and part of January. Now to show the immense advantage of a three-way town over a two-way—the kind hitherto universal on earth—look at the figures of a square and a hexagon. Where all the crossings are rectangular, the greatest waste of time in going from one point to another is from A to A, exactly twice the actual distance. But this applies only to a short journey round one chequer. For longer ones, the greatest waste is from B to B′, which exceeds the direct path as about 17 to 12. But the average is as from B′ to C, exceeding it as 15 to 11·18, nearly. Now where only crossings at 60° occur, the greatest waste in a single hexagon is from D to D, about 45 to 26; but the greatest at long distances, as E to E′, about 15 to 13, and the average as E′ to F, or only as little as 15 to 14 instead of 15 : 11·18.



Another advantage of the 60° crossings, however, is that, as all the blocks are hexagons or trigons, I would build only on the hexagons, and leave the trigons as gardens. In Mr. Howard's model city, there are really no gardens visible, nor imaginable, unless he means his oddly-shaped blocks of building, exceeding sometimes ten acres, to contain private gardens. But round his central park of 145 acres, the ring of town is merely a piece of London inclosed by a ring of factories, and beyond a railway. To make all the crossings rectangular (their worst form) half the streets are made into circles, a most abominable kind of street of wedge-shaped rooms. Victoria-street, Westminster, was planned circular, but has rightly been reduced in the building to two straight lines.

There is no advantage whatever in the extravagantly wide streets he plans, as wide as Portland-place, which ought to have a central avenue of trees. As all mine are thoroughfares, I reduce them to 52ft. The trigon gardens are with sides of 225ft., and a perpendicular practically 195. The perpendicular to a trigon of 15ft., being 12·99038, we may reckon it 13. The surrounding streets being then made 52, the side of my hexagon is 285, and its area approaches five acres, that of the trigon exceeding half an acre. Thus no building can face another; but every one looks out on a garden of nearly half an acre. The central square absorbs two trigons, and a sixth part of each of two hexagons. The library and the hospital each fill a whole hexagon. The four trigons marked M are to be covered markets. All others would be gardens, except those adjoining the parks, which are the best places for churches and chapels. These are the only public buildings that ought to be detached, and equally ornamental over their whole exterior.

Now, with regard to the naming of streets, this is not a trifle, but a serious point. Mr. Howard is for imitating the Parisians, and having Columbus-avenue, Newton-street, &c. This I oppose as meaningless, and giving no information. Who knows whereabouts Newton or Milton occur? In outer London, away from the old city, the only well-named streets are Oxford-street, Great Dover-street, Kent-road, and Essex-road, which tell towards what regions they lead. If we want to honour Shakespeare or Milton, let us build monuments to them; but naming streets after them is a sham honour, and utterly misleading. The American numbering of streets is good; but we must distinguish where they lead. In every town six names are needed, North, South, and the four surrounding counties, or large towns, about thirty or forty miles distant. Supposing a site in central England; I have put Bangor, Hull, Devon, and Kent, but meaning rather the four neighbouring places, not so distant. But all parallel streets would bear the same name, distinguished by numbers. The north and south streets being right and left, the next to the left would be third, then fifth, and so on. But the next to the right would be fourth, then sixth, and all the even numbers. But as there is only one main Devon-street, or Bangor, or Hull, or Kent, those to the right thereof are second, fourth, &c., and those to the left are third, fifth, seventh, &c. It will be observed that I have drawn the hexagons A A each with two rooms crossing over the streets. These are to mark where their names change, from North-street to South-street. In the same way, B B B B have overhanging rooms where the Devon streets change to Hull streets, and so have C C C C where the Bangor change to Kent streets. But these rooms must in no case be carried, like Sir Christopher Wren's Temple Bar, by a single arch across the road, but by two arches; as the Romans did with all their street arches, from the Golden Gate at Jerusalem to the North Gate at Lincoln.

The three branches of railway that I have shown would serve about as many of the factories, in the 48 adjoining hexagons, as Mr. Howard's circular railway that surrounds his whole town of 32,000. It is impossible to fix the exact relative spaces for dwellings and factories, and the superstitious limiting to towns of 32,000 people must be given up.

E. L. Garrett.

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XVI.

If the amount of the stresses upon the different bars of the web given in the table in our last article be compared with those recorded in Table I. accompanying Article XII., it will be at once observed that the former are exactly three times the latter. It might be remarked that it would have been a very simple matter to have written them down at once in the ta[illegible] and saved the trouble incurred in calculating [illegible] separately. So it would have been, and in [illegible] future similar computation of stresses we shall certainly adopt the shorter method; but it would not have been consistent with the principles we have laid down for ourselves, and steadily adhered to in articles of the present character, to take, in the first instance, anything for granted. Mere statements, unaccompanied by demonstration and proof sufficient to satisfactorily test and elucidate their accuracy, are of little value for the purposes of imparting both information and instruction, which it is our object to do. Another equally important and equally valid reason why the calculations for the stresses induced upon the trussed girder by the rolling or live load were arrived at independently, is that the relation of three to one in the different stresses upon the bars of the web is not general and universal, but only a particular coincidence, varying with each especial case. In the present example, the ratio of the rolling load to the dead load is as two to three, and therefore the total stress upon any bar is the sum of the separate stresses due to each description of loading, that is equal to three times the stress resulting from the action of the dead load. It must, however, be borne in mind that, whatever may be the proportion between the amount of the two descriptions of loading, a similar ratio will also exist between the amount of the single stress and the sum of them respectively. It may be pointed out that if instead of a uniformly distributed equivalent load being adopted, the principle of concentrated loads, varying both in weight and position, be employed, the application of the proportional formula will be very much modified and complicated, and in many cases will fail altogether. Whenever there is any doubt in the matter, the wise and proper course to follow, which is always an accurate and reliable one, is to calculate and tabulate the separate stresses brought upon every member of the girder or truss by each individual subdivision of the total dead and live loading, placed at the upper or lower apices, as already described and carried out.

It remains now, in order to complete the design of the central independent girder, to apporsion the proper net sectional areas to the ties and struts in the web, and the proper form or shape which should be given to each. An elevation of the truss, in Fig. 1, will be sufficient to show the number and order of the different bars, since the two halves of the truss are symmetrical. Commencing with the ties, the tensile stress upon each of the verticals A B and $A_1 B_1$, is equal to 45 tons, that is, equal to the reaction at each of the abutments. The working stress per unit of area or per square inch of material has been limited, for reasons already explained, to six tons, so that if A be taken to represent the net sectional area of the terminal vertical members of the web A B and $A_1 B_1$, the value of A is given by the equation—

$$A = \frac{45}{6} = 7{\cdot}5\text{sq.in.}$$

or, in round numbers 8sq.in. As all the vertical members are under stresses of tension they may consist of a plain bar section, so that for each vertical bar under consideration a section for each 12in. × $\frac{3}{4}$in. would give 9sq.in. of gross sectional area. Until the dimensions and form of the pair of counterbracing bars in the central panel of the girder, shown by dotted lines in Fig. 1, are brought under investigation it will be unnecessary to allude to more than the one series of web members, both vertical and diagonal, situated on the left-hand half of the truss. It must be remembered that in all built-up girders and trusses, or in fact in any structure which possesses joints and connections —and there are very few which do not—the gross and net sectional areas are never equal to one another. Putting these areas equal to A and A_1, respectively, the general equation—

$$A = A_1 \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

will only hold for monoliths and materials deposited or employed *en masse*. Using the same notation, the formula practically becomes

$$A > A_1 \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

For purposes of calculation, however, the amount of the net sectional area is obtained from the following equation:—

$$A_1 = (A - A_2) \quad \ldots\ldots\ldots\ldots (3)$$

in which A_2 represents the loss of material in any member by the necessity of making holes in it, or, as frequently occurs, of cutting off a piece of it in order to make a good joint or "fit" with its neighbours. It is quite immaterial in what manner the value of A_2 may be obtained; but in all instances it should, for the security of the structure, be computed as large as is consistent with the exigencies of sound design and of good workmanship. It is always preferable to err on the side of safety, and not "spoil the ship for a haporth of tar." Our readers must not mistake our meaning here, for it is not to be understood that more holes are to be made in any member of a built-up structure than what are required to insure the proper attachment of the various parts of it, but that a liberal allowance is to be made in estimating the loss of sectional area, that is in the value of the quantity represented by the symbol A_2. As an example, let us suppose that, so far as the absolute theoretical line of cross-section is regarded, it is necessary to deduct only two holes in any separate member; but it is very possible that in practically putting the metal - work together, another hole—and consequently a further diminution of the net sectional area is incurred—may be pierced, and, therefore, it will be advisable to deduct the three holes instead of the two. Those who have followed our articles thus far cannot fail to observe that we have adhered to this useful rule in determining and apportioning the required net sectional area of the plates and angle-steel horizontal flanges of the independent central truss in Fig 1. It has been already stated that the tie-bars are to be double, and, therefore, to obtain the total 8sq.in. demanded, the single bar 12in. × $\frac{3}{4}$in. may be replaced by two, each of which is 6in. × $\frac{3}{4}$in., and equal to $4\frac{1}{2}$sq.in. of gross sectional area; but as it is not judicious nor desirable to cut down the metal too fine, the amount will be taken at 5sq.in., which can be readily obtained by making the bar 7in. × $\frac{3}{4}$in. or 6in. × $\frac{7}{8}$in. As in all probability more rivet area will be needed than what has been hitherto provided, it will be preferable to increase the width and not the thickness of the bar, for it must be kept in view that no additional area for spacing the rivets is afforded by augmenting the thickness of either the bar itself, or of any part of the flange, or of any other member to which it is to be connected. The next step to be undertaken is to ascertain whether a tie-bar 7in. × $\frac{3}{4}$in., will when the necessary number of rivet-holes have been deducted, be equal to the required net sectional area of 4sq.in. In order to determine this detail, the method of attaching the tie-bar to the flanges of the truss must be considered, and a drawing made for the purpose, as shown in Fig. 2, which represents in elevation the mode of uniting the flanges and the web of the girder. Since by means of the rivets, the stress upon each bar, which is equal to 23 tons, is transferred to the flanges, the area of the whole number of rivets must be equal to the net sectional area of the bar, or equal to 4sq.in. If A be the area of a rivet which is 0 75in. in diameter, and N the number wanted, we have—

$$N = \frac{\frac{4}{1}}{\frac{\pi d^2}{4}}$$

from which, by inserting the proper equivalents for π and d the expression becomes—

$$N = \frac{\frac{16}{1}}{\frac{3{\cdot}1416 \times 9}{16}}$$

and finally, by reducing and dividing, the value for N is found to be—

$$N = \frac{256}{28} = 9 \text{ rivets.}$$

These rivets have to be inserted in the part of the tie-bars to be connected to the flange. This number is based on the assumption that all the rivets are in single shear; but as it is intended to place the vertical tie-bars between the angle steels of the upper flange, the rivets will be in double shear and may be reduced to five. It will be found after one or two trials, since there should be at least a good inch of space between the rivet-holes themselves, and also between them and the edges of any plate or bar or other section composing a member, that a slight alteration must be made in the length of the vertical rib in the longitudinal angle steels of the upper flange, and also in the width of the vertical tie-bar. These dimensions are, in Fig. 2, which shows an elevation of the attachment of one of the tie-bars of the web to both the upper and lower flanges, increased to 4in. and 8in. respectively. A section through the line *x x* at right-angles to the plane of Fig. 2 is given in Fig. 3, which applies, as will be seen, only to the tie-bars; but in another drawing, the cross-section of the main girder will be shown complete, which will indicate the manner in which the fixing of the diagonal compression members of the web is provided for. In Fig. 3 a diaphragm built up of a steel plate 8in. by $\frac{1}{2}$in., and a double pair of angle steels 3in. by 3in. by $\frac{1}{2}$in. is placed between the vertical flange plates of the lower flange to give it additional thickness. A similar diaphragm may be riveted up to the upper flange, if considered desirable; but as that flange, by reason of its trough form and limited depth, possesses plenty of rigidity, the extra material, (comparatively small as it is, may be dispensed with. It will be observed that by the employment of the diaphragm in the lower flange the rivets in the vertical ties are put in double shear, so that the number in the joint is more than what is absolutely required.

There is no difficulty in apportioning the section or area of the remaining vertical tie-bars and the pair of diagonal counter-braces, if it be borne in mind that as the stresses diminish for the members of the web towards the centre of the truss, so the net sectional area may be reduced in exactly the same proportion. The next tie-bar under these conditions is C D in Fig. 1, which has been found to be subjected to a stress of 30 tons, as given in Table III. of our last article, or one-third less than the maximum stress of 45 tons upon the terminal bars A B and $A_1 B_1$ of the web. Both these bars are double, as in Fig. 3, and it will be found that a net sectional area of 4sq.in. was sufficient for each. To find the same amount of metal for the tie-bar C D, we have the following ratio, putting A_1 for the area, and taking care to use half the stresses which may be made equal respectively to 15 and 23 tons—

$$23 : 4 :: 15 : A,$$

from which we have—

$$A_1 = \frac{4 \times 15}{23} = 2{\cdot}6\text{sq.in.}$$

It will be advisable to retain the same width for the bar C D as was given to A B, which is 8in. Deducting three rivet holes (see Fig. 2) from this width, and making the bar $\frac{1}{2}$in. in thickness, the net sectional area is equal to—

$$(8 - 2{\cdot}25)\tfrac{1}{2} = 2\ 87\text{sq.in.}$$

which is sufficient. The vertical tie E F and the two counterbraces F*a* and C*a*, which are also in tension, may be allotted the dimensions of 6in. by $\frac{1}{2}$in. in thickness. This scantling is rather more than the same method of calculation we have used would allow; but for practical reasons it is not good construction to fine down too much the amount of material in the members of the web at and near the centre of the girder, although purely theoretical considerations might permit it.

We have now to turn our attention to the diagonal struts, or members in the web which undergo a stress of compression. In dealing with these, the same mode of procedure and calculation will be adopted as in the case of the vertical tie-bars, and the struts subjected to the maximum stress will be first dealt with. These are the bars A O on the left-hand half and A_1 O on the right-hand half of the truss. As similarly to the vertical ties, and restricting ourselves to the left-hand half of the girder, the diagonal A O is double; it really will consist, as will be hereafter shown, of a pair of bars braced together by a system of lattice triangulation, so that it may be treated as a single member subjected to the total stress upon it of 63·61 tons recorded in Table III., or, in round figures, to 64 tons. The great point of difference to be attended to in the designing of struts—which are substantially inclined pillars or columns—is that while their net sectional area is the same as if they were replaced by ties, their form is altogether different. It is generally stated, and often taken for granted, that provided a tie-rod or bar of any section is only acted upon by a tensile stress, its length need not be made a factor in the calculation respecting its strength and powers of resistance. Up to certain limits, exceeding those in the case under notice, this statement is fairly accurate; but it will not hold when the length of the tie exceeds certain dimensions. A tie, like a strut, whether in an inclined or horizontal position, is subjected to a bending action and transverse stress from its own weight, which weight increases in the proportion of its length. In a horizontal position, although fixed taut at both extremities, it is a universal practice in roof trusses and other similar structures to support it by vertical king and queen rods to take the "sag" out of it. There is probably no example of applied mechanics which has been so universally

FIG. 1.

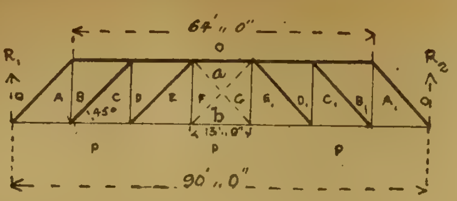


FIG. 2.

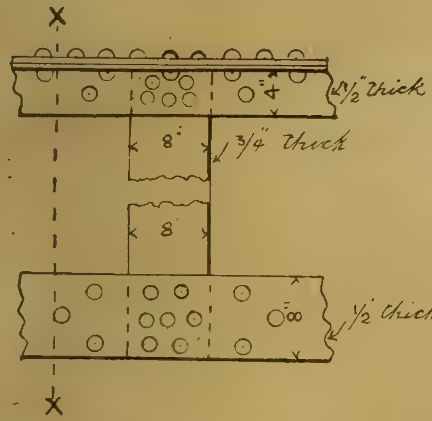
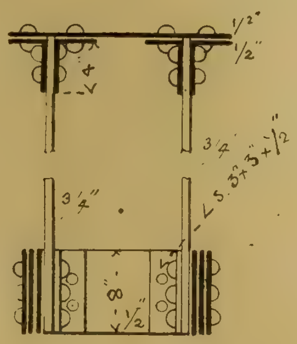


FIG. 3.



treated of in textbooks and treatises as that relating to the strength of posts, pillars, and columns, and it is rather an unsatisfactory conclusion to be compelled to arrive at, that not two of the numerous formulæ for solving the problem afford, when thoroughly investigated and worked out, even approximately similar results. Referring to the statement made that for the same amount of stress the same sectional area is required for a strut as well as a tie, it is assumed that to meet this condition, the ultimate stress, or what amounts to the same, the working unit stress, is the same for both tension and compression for the same material.

In addition to the proper form to be assigned to a strut to prevent it buckling or becoming deformed under the stress applied to it, there is another point which has to receive very careful consideration and attention. It is the proportion between its length and its breadth, and before passing on to the design of the diagonal compression members of the truss in Fig. 1, some remarks are indispensable. In the first place, the question of a strut in the web of a girder having a tendency to deflect either at the centre or anywhere else, may be discarded, because it is the business of the designer to provide by a proper system of lateral bracing against the possibility of the occurrence of such a contingency. The general rule laid down for the proportion of the length of any strut or column to its breadth, which means its least side or transverse dimension, is the following. Put L for the length of the strut in feet, and B for its breadth in inches as that dimension, except in very large examples, will not run to feet. Then we have—

$$B = \text{or} > \frac{L \times 12}{40}$$

In other words, the least transverse dimension is not to exceed the fortieth part of the length of the strut. If, for instance, we have a strut 30ft. in length, then, applying the equation, its least breeadth becomes equal to—

$$\frac{30 \times 12}{40} = 9\text{in.}$$

In our next article we shall apply these rules to the struts in the girder, and also show the method of uniting them to the flanges, both upper and lower, as the mode of attachment is not the same in both instances. It will remain, then, to investigate the stresses upon the cantilever and anchor arms of the bridge. These investigations and calculations will not be so explicit as those already given, as the principles already enunciated will be taken for granted, and only the results brought forward.

T. C.

* * *

The new schools erected in connection with St. Peter's Roman Catholic Church, Bloxwich, were opened on Monday. The cost had been £2,350.

A TREATISE ON SURVEYING.*

LAND-SURVEYING is a branch of practice that has lately suffered from two main causes; first the establishment of the Ordnance Survey and maps, and, secondly, the decline in the art as a special vocation brought about by the completion of our larger railway systems. Both these causes have materially reduced the practice of the higher class of surveying—the geodetic. The chief fields of employment now for land surveyors are the colonies, where, however, a local training or apprenticeship is required, and it was to meet the requirements of colonial surveying that, three years ago, a number of gentlemen interested formed themselves into a committee to consider what steps ought to be taken to secure a better position for the English student who might desire to seek employment in any of the colonies. They met, by permission of the secretary, at the Surveyors' Institution, and it was arranged they should prepare a textbook on surveying, which the council agreed to adopt if satisfied. The result is the present volume, compiled by Mr. Reginald E. Middleton, M.Inst.C.E., and Mr. Osbert Chadwick, M.Inst.C.E., &c. In order to suit two classes of students, those who desire only to practise ordinary surveying, and those who are desirous to qualify themselves for geodetic problems which require a higher mathematical knowledge, including astronomical determinations for marine and other special surveys; the work is divided into two parts.

The work has been well done, and the following contributors are given in the preface in addition to the chief compilers:—Col. J. Du Bogle, late R E.; G. H. Leane, F.S.I., examiner to the Surveyors' Institution, who unfortunately died at sea on his return from Africa; Major-General Woodthorpe, C.B., late R.E., appointed Surveyor-General of India just before his death. The contributions of the two latter have lost the advantage of their revision. Mr. M. T. Ormsby, demonstrator in surveying at University College, has assisted in the editing, and in the preparation of drawings and tables. Chain surveying is the subject of the first chapter. In addition to the usual preliminary remarks on the equipment of a surveyor, the chain, steel tape, arrows, offset and ranging rods, optical square, clinometer, cross staff, &c., this chapter treats on methods to insure greater accuracy with simple instruments and an improved form of field book is given. Method is of the first importance in the simplest surveying operations, such as chaining, and the author recommends the follower to approach the arrow holding the handle of chain in his right hand, his field book in his left, his pencil between the fingers of his left, his off-set rod under his left arm, and any arrows he may have collected hanging upon the little finger of his left hand. By this arrangement his right hand is free to direct the chain, to use his rod, and to make his notes. The other operations are described minutely, and the authors show that in rough and hilly ground the limit of permissible error is $\frac{1}{500}$, or two links in ten chains. Many causes contribute inaccuracies, such as the chain not being hauled fairly taut at the moment the arrow is put in, through the "leader" not holding his arrow exactly at the chain end or perpendicular, through the "follower" not bringing his end of chain fairly up or allowing leader to drag his arrow out of perpendicular, from knots in the chain, sloping ground, variation of length in chain, &c. The testing of chains and tapes is absolutely necessary before lengths are chained. Stretching by pulling is often the fault, and every chain should be compared with some standard, such as that at Trafalgar-square. Other causes of error are considered, as those made in booking, through miscounting arrows—a frequent mistake, reading from wrong end, &c., and chaining in sloping ground. Some useful suggestions are given as to the latter, such as taking reduced lengths till the whole chain is taken in the case of falling slopes. Where the slope rises in a forward direction, the offset-rod or plumb-line is used by the "follower," and the leader is directed to return to a nearer brass mark holding the chain on the ground. These are rough methods sufficiently true for practical purposes on short inclines; but, of course, if great accuracy is required, a clinometer should be used to find the angle of slope, the chain being pulled forward the full length plus the allowance. To ascertain the angle of slope in this way the authors give a convenient method, which is to "place a ranging rod at the next change of incline, having a flag or piece of paper tied at the height of observer's eye, who, standing erect at his end of the line, sights the mark on the forward rod with his clinometer, records the angle, and notes the allowance per chain to be made, or he lays his rod upon the ground or the incline, and places his clinometer upon it, and so ascertains the angle of inclination." Of course a table of natural secants is necessary to make the proper allowance per chain. For ordinary surveys all inclines under 4° may be neglected: this angle only makes 100·244, links, or about $\frac{1}{4}$ link per chain. The remarks on offsets, obstructions, and the method of ranging past buildings, &c., contain little that is new. The examples given of the field book showing the offsets are worth careful study by the student, especially the remarks on taking offsets to fences where there are two on the same side of chain line (p. 10). A diagram of the main lines, showing the base-line of principal triangles, and numbering each in rotation, is essential, as shown in the field-book of Yeldon Farm. Some of these lines form the backbone of the survey; others are subsidiary or tie-lines, others are proof-lines. It is necessary also to show, by arrows on the lines, the direction they are chained, numbering them consecutively. The rules for arranging the lines of a survey are succinctly put: the importance of a good main line as a "backbone" upon which the triangles are built, these latter to embrace, as far as possible, the fences and other objects; interior lines, which will serve to pick up the detail. One good rule is that no offset should exceed a chain in length. The remarks on fences and boundaries are useful; also those on making notes at the commencement and termination of survey lines. Thus, instead of writing "Line 12 commencing from 940 on line 1," it is only necessary to write "Line $12^{\frac{940}{1}}$" at commencement, and a similar form at the closing of a line. The plus or minus sign is used to show if a line does not close upon a registered station, but goes beyond it, or falls short of it. Thus, if the station is 1240, and there are, say, 15 links beyond it, $\begin{array}{r}1240\\+15\\\hline 1255\\\hline 2\end{array}$ may be placed at end; or, if short of station, the minus sign should be put before the number of links short. This will give a concise and full record of how the closing measurement has been arrived at. The remarks on plotting, scales used, laying down lines in plan, how to find true north, calculation of areas, &c., explain a number of useful points. Very often a surveyor is in doubt as to the scale he should plot his survey to; but the list of scales given for different purposes will quickly solve his doubt. Thus for small estates $\frac{1}{792}$ or one chain to one inch, for working surveys two chains to an inch, drainage schemes 200ft. to the inch, are commonly used. A description and diagram of the computing scale are given, and will be found of service. Another means of finding areas is by using Amsler's Planimeter, which is also explained. Methods of linear measurement with a steel tape where great accuracy is required, and the correction of error in steel tapes, corrections for temperature, and other points are explained. The next chapter (11) explains the optical principles involved in the construction of the instruments used by the surveyor. We consider this a most valuable addition to a treatise on surveying; those books published on the use of instruments being chiefly descriptions of the instrument, without going into principles. In descriptions of the adjustment of instruments like the theodolite too much is taken for granted, and the student is left in the dark as to some of those adjustments.

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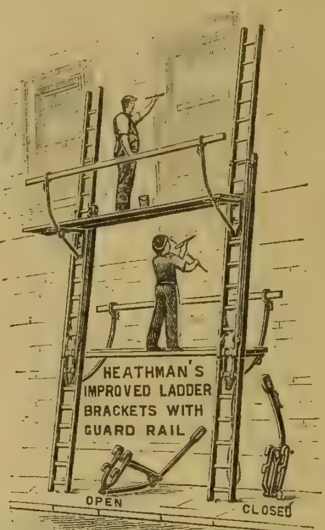
* A Treatise on Surveying. Compiled by REGINALD E. MIDDLETON, M.Inst.C.E., and OSBERT CHADWICK, M.Inst.C.E. In Two Parts. London: E. and F. N. Spon, Strand.

Traverse surveying and a form of field-book for traverse survey forms *another* chapter. As some of our readers may not know, traverse surveying is determining the bearings of a line or route or boundary by means of a compass, just as the mariner determines the path traversed by the ship on the ocean. Instead of taking magnetic directions of the several lines and inclinations to each other, the instrument is used to determine these inclinations, in relation to some line of direction fixed north and south. It is defined to be a method of surveying "by which each survey point is determined by one angular and one linear measurement," instead of by two or more linear measurements, as in chain surveying. But this system of angular and linear measurements, unless very exactly taken, as in a polygon, when plotted will not "close." All plotters know the difficulty, and the accuracy of angles must be tested by a formula that "the sum of the exterior angles of a polygon, diminished by four right angles, is equal to twice as many right angles as the figure has sides," or if the interior angles are taken, "added to four right angles" must be substituted for "diminished, &c." But in large surveys another method of recording the directions of the lines is used, more accurate and less troublesome; it is the plotting by co-ordinates from a central line or meridian. As these ordinates are a succession of perpendiculars from the meridian, laid off by a cross staff to the corners of the field or boundary, their distances apart successively measured on the meridian, and at right angles thereto, it is easy to understand how each point can be plotted off. Each point of the survey can be plotted independently by laying off two measurements, one along the meridian and one perpendicularly thereto, by which the point is fixed, or in other words each point is fixed by the meridional distance, and the perpendicular to the point, or co-ordinates of the point. Full definitions and explanations are given of these, the difference of latitude or "northings" or "southings" as they are called, and the "eastings" and "westings" as the departures are called perpendicular to the meridian. A good example is given of the manner of surveying an irregular polygon, and the angles, the systems of rotation, the "whole circle" and "four-quadrant" system, measuring bearings and other details are described. The advantages of the "direct bearing method" are shown; while computation from including angles is liable to a summation of error. An example is given of a traverse survey. Much may be said for traverse surveying. Of course this system supposes a knowledge of trigonometry or at least the relations of sine and cosine. Several checks to this system are given, such as that if any figure be traversed such as a polygonal field or boundary the sum of the "northings" will be, or ought to be, equal to the sum of the "southings," and the "eastings" to the "westings." A form of field book shows the sketch diagram of lines, the manner of recording the observed angles of each point, distances, &c, for main and subsidiary traverse. The manner of or detailing buildings, plotting, &c., will be found of service to the young surveyor. Another chapter discusses "Minor Triangulation," a method less complete than that of primary triangulation. The most powerful instruments are used in surveys of this kind, as the points are often from 20 to 100 miles apart, and, of course, the sphericity of the earth is taken into account; but we stop here. The treatise is very complete and thorough, and brings up to date all the latest methods of surveying. It is well illustrated by plans and diagrams.

A NEW LADDER BRACKET.

THERE is nothing like precaution, and increased security gives the employer greater peace of mind. Mr. Heathman, the patentee of the telescopic ladders in Endell-street, London, W.C., has improved his folding ladder bracket by lengthening the arm, and finishing off with a socket, to which is attached a jamming thumbscrew to secure a piece of quartering which can be run through the socket to form a guard-rail for the workers. These brackets adjust at all angles, either at front or back of the ladders, and they are wide enough to receive two scaffold boards.



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THE BRICK TRADE.

WHEN we wrote on the 3rd inst. advising the public to be careful about investing in brick companies, however flourishing their prospects might appear on paper, we did not think there would so soon be need to note our advice.

The prospectus of the Woolpit Brick Co. has been published. Its prospects *on paper* are certainly flourishing. On a capital of £80,000 in ordinary shares and £20,000 in 5 per cent. debentures, or a total of £100,000, it is estimated that a *net* annual profit of £25,000 per annum will be earned—*i.e.*, 25 per cent. A tempting prospect certainly. One is inclined to ask, Why does not the owner keep it himself?

When, however, one comes to look into its true history, the wonder ceases. The Woolpit Brickworks were either started, taken over, or influenced by the Imperial Property Investment Co.—a company registered in 1875 and wound up in 1894. A reference to the reports of the meetings of this company will reveal the fact that the Woolpit Brickworks were regarded as an incubus; certainly not as a source of profit. It may safely be stated that they were one of the troubles of the Imperial Property Investment Co., which culminated in its being wound up in 1894.

As a consequence, the works came into the market. We have before us the catalogue of the machinery and brick plant at the Woolpit Brick and Tile Works, to be sold by Mr. E. Jackson at the works, Woolpit, in April, 1896, and on the back of the catalogue is a notice that the freehold estate of about 145 acres—the same area, be it observed, as stated in the prospectus—known as the Woolpit Brick Works, would be offered for sale at the Great White Horse Hotel, Ipswich, on April 7, 1896. We have also before us an extract from the *East Anglian Times*, in which it is reported that the freehold estate was disposed of at the sale, and that the purchase price was £3,200. Is this property, which was bought for £3,200, the same which the syndicate or the vendors propose to sell to the company for £80,000?

In 1898 a prospectus was issued. It is headed "Rough Draft—Private." One can only suppose the effort to float the concern then made was not successful, for we have now the fresh prospectus issued to the public last week.

There are some interesting points of difference between the "Rough Draft—Private" prospectus and the public one.

In the private prospectus the capital is..	£125,000
In the public one	100,000

Apparently from 1898 to 1899 the vendor's estimation of the property he is so anxious to dispose of to the public has depreciated £25,000. Will it go on depreciating at the same rate every year?

The directors, auditors, solicitors, secretary, and offices in the 1898 "private" prospectus are not to be found in the 1899 public one, and while the brokers in 1898 were to be at London, Glasgow, and Belfast, now they are to be found in London and Newcastle-on-Tyne.

In the 1898 "private" prospectus we find the managing director is to be Thomas Parker, Esq., of Woolpit, who reported that £435,000 was the value of the freehold owned by the company. Was this the freehold bought for £3,200? He is described as a gentleman of large and varied experience in brickmaking, not only in England but in the United States and Canada. He was willing to enter into a contract to serve the company either upon salary or to manufacture and place on rail at Elmswell all bricks at a cost of 10s. per thousand. He stated that by expending £5,000 or £6,000 upon plant an output of 30,000,000 bricks per year could be produced. In the new prospectus £20,000 is wanted! It would be very interesting to know what has become of Mr. Thos. Parker, and why his offer to make and put on rail at 10s. per thousand was not accepted.

In the place of Mr. Parker, mentioned in the "Private" Prospectus, 1898, we find in the Public Prospectus, 1899, Mr. Alex. Swinney and Mr. Chas. D. Lavington as joint managing directors. Where one managing director was thought necessary, the company now thinks there must be two. Is Mr. Lavington a builder, and the gentleman who bought the property for £3,200? Mr. Swinney is described as "the well-known expert."

Mr. Robert Brown, the managing director of the Tyrone Colliery Sanitary Pipe and Brick Co., Dungannon, may be familiar with the difficult Suffolk brick clay. Suffolk has a very long record in the history of brickmaking, and there are plenty of Suffolk brick manufacturers who have been in the trade the whole of their lives, and their fathers before them, who could have given a report upon which the public might confidently rely.

Mr. Swinney is stated in the prospectus to be one of the directors of the Heaton Brick Co., at Newcastle-on-Tyne, but it is not stated that he also travels for the firm of Swinney Bros., who are manufacturers of brickfield machinery. The directors say they have made provisional arrangements for the acquisition of machinery. It would be interesting to know whether it is with Messrs. Swinney Bros. Short particulars of the buildings and plant are given. Mr. Swinney estimates their value at £19,325. Now we venture to say that the outside cost of such buildings and plant would be nearer £5,000 than the £19,325 mentioned in the prospectus.

Mr. Swinney considers the value of the clay bed to be £97,500! Mr. Parker in the 1898 "private" prospectus puts it at £435,000! and if this is the property offered for sale by Mr. E. Jackson, it was actually bought for £3,200.

Mr. Swinney further estimates the profits at £25,000 per annum. Now, we are perfectly certain that no wire-cut brick was ever yet made at a cost of 10s. per 1,000. It requires nearly that sum to make and burn alone. As for making by hand red and white Suffolk bricks at 16s. per 1,000, it is simply absurd. But the important point is, What is to be done with the forty millions of bricks when made? Where is the market, and how are the bricks to be got there? London is probably the only place where the bricks could be absorbed.

The prospectus does not distinguish between the quantities of red and white facing bricks and common bricks. From our experience, we should say the outside quantity of best red and white Suffolk facings used in London and supplied from *all parts* of Suffolk would be five millions per annum, and there is no demand for more. With regard to the common bricks we also note that the rate from Elmswell to London is 4s. 2d. per ton or over 10s. per 1,000. This compares with 3s., the cost of carriage from Kent by water, or 5s. 6d. to 7s. 6d. by water from Harwich or Aldeburgh.

The vendor states that he acquired the property 2½ years ago; but no result of his trading is given, and no certificate from any firm of accountants appears in the prospectus.

	£	s.	d.
The vendor is to be paid in cash ...	£5,000	0	0
By the issue of mortgage debentures at 5 per cent.	20,000	0	0
	25,000	0	0
In ordinary shares	26,666	0	0
And the balance in cash or shares at the option of the directors	28,334	0	0
	£80,000	0	0

The cash and debentures, amounting to £25,000, are certainly a handsome return alone on the original purchase, and when to that the vendor adds the chance of another £55,000, supposing the company to be floated, we shall congratulate him on his good fortune. We do not know whether the capital has been subscribed, or if the directors will go to allotment; but we are afraid that any investors who have put their money into this undertaking on the faith of the hopes held out in the prospectus will be disappointed.

OBITUARY.

We regret to hear of the death of Mr. Charles Gordon Killmister, of Bushey, Herts, formerly a well-known member of the Architectural Association. Mr. Killmister, who died on Monday week, the 13th inst., was for nearly twenty years a member of the A.A., and took a prominent part in the dramatic and lyrical entertainments, while on the summer excursions his genial manners and *bonhomie* made him a welcome member of the party. He formerly practised his profession in Barton-street, Dean's-yard, but prolonged ill health and mental affliction had necessitated his complete retirement some years since. The interment took place at Presbury parish churchyard, Cheshire.

CHIPS.

The new organ in the nave of Norwich Cathedral is to be formally opened on Tuesday, December 12.

The unveiling of a tablet to the memory of the late Rev. Thomas Millar (1856-98), St. Paul's Parish Church, Leith, took place last week. The tablet is of white marble, and is erected in the vestibule of the church, opposite the main entrance. In the centre of the tablet is a medallion by Mr. R. S. Stevenson, R.S.A., of Edinburgh.

Messrs. Cope and Stewardson, of Philadelphia, have received the first premium in the competition for the new building for Washington University, St. Louis.

M. Ferdinand Humbert has finished his mural decorative pictures in the Panthéon—eight panels, illustrating by incidents Faith, Patriotism, the Family Tie, and Charity, including the return of fishermen by moonlight, thanking God for their safety and good fortune; a family meeting in the country at sunset; and the departure for the army of a young man during snow. The panels left unfinished by M. Puvis de Chavannes have been completed by M. Cazin.

The improvements effected on the River Weaver, at a cost of £70,000, are nearly complete, and the electrical swingbridge of Northwich is about to be swung over the river for the first time. This and the sister bridge have cost £25,000, and are the first bridges in the kingdom to be worked by electricity. Vessels of 400 tons burden can now navigate the river direct to Liverpool or Manchester.

The tramways committee of the Wolverhampton Corporation propose to sanction an experiment for constructing a tramway along the Wednesfield-road to Heath Town on electrical lines. The work is to be carried out according to an invention of Mr. T. H. Parker, electrician, by what is called the surface contact system instead of the overhead system of wires. The cost of constructing the road for the system along the route of three-quarters of a mile is estimated at £3,000.

A fresco has been dedicated at St. Matthias, Stoke Newington. It was executed by Messrs. Davidson and Bell, and depicts Our Lord coming to His vineyard, and it is in the south aisle.

Mr. Sandford Fawcett held an inquiry on behalf of the Local Government Board at Leicester, last week, touching applications by the corporation to borrow £33,100 for the construction of a wholesale market, £13,308 for street improvement purposes, £5,640 for sewerage and storm-water drainage, and £326 for the purchase of land for a branch fire-station. The money for street improvement is mostly required in connection with the plan for widening High-street, which is being carried out at a cost of over £100,000, to meet the increased traffic. There was no opposition to any of the applications.

PROFESSIONAL AND TRADE SOCIETIES.

Architectural Association: Discussion Section.—At the last meeting, held on Friday, November 17, Mr. Robert Williams, F.R.I.B.A., read a paper on "Tenement Houses for the Working Classes," dealing with the subject both from an historical and idealistic point of view. The methods of the London County Council and the results of their recent competition were severely criticised, and the rents charged for the tenements were considered too high. A good discussion followed the reading of the paper, which was ably summed up by Mr. T. Blashill.

The Architectural Association of Ireland.—On Tuesday night a meeting of the Architectural Association of Ireland was held in the Grosvenor Hotel. Mr. G. Sheridan, President of the Association, occupied the chair. Mr. Anthony Scott read a paper on "Round Towers of Ireland," in the course of which he said that the question of the round towers was one worthy of the attention of the antiquarian and the scholar. To say that these towers were the conquerors of time was to express a fallacy. At present there were standing about half of those of which history gave a record. The object for which they were designed and erected appeared to be the only question requiring further elucidation than that which had obtained up to the present time. Having referred to the researches of various students of antiquities, he pointed to what had been discovered of vandalism in the destruction of ancient Irish manuscripts, and attributed to this destruction much of the mystery and uncertainty which hangs around these towers. If they were erected at a period much earlier than Christianity they would bear distinguishing features not to be found in the works of modern times. But whatever the period of their probable erection, there could hardly be any doubt but that they were a type of a structure or structures still older. He mentioned a number of theories put forward by different authorities, and said it might be that the intercourse of the old monastic orders in this country with those on the Continent gave rise to the erection of circular buildings for religious purposes. With regard to the idea that the round towers were built by the Danes, he said if that were correct it might be expected that in the districts where they had their strongest footholds most of the towers would be found. That, however, was not the case, and he thought it was abundantly clear that the Danes had nothing to do with the erection of the towers. It might be admitted that the architecture of the Middle Ages was designed and constructed to meet the requirements of lawless times, and it was reasonable to suppose that the ecclesiastics had to look to their security and that of their effects, and in that way these tall circular buildings may have appeared. The concluding portion of the paper was devoted to detailed references to the architectural features of some of the principal towers to be found throughout the country. A long discussion followed the conclusion of the paper, the general opinion being that the towers were of Pagan origin, and were adopted by the early Christians for use in their religion, and were afterwards rebuilt by them. A vote of thanks to Mr. Scott for his paper was passed unanimously.

Northern Architectural Association.—The opening meeting of the 40th session of the Northern Architectural Association was held on Nov. 15 in the Art Gallery, Newcastle-on-Tyne. In the absence of the president (Mr. William Glover), through indisposition, the chair was occupied by Mr. Joseph Oswald. The President's inaugural address was read by the hon. secretary, Mr. Arthur B. Plummer. He mentioned that among the buildings in Newcastle just completed or nearing completion are the Asylum, by Mr. Dyson; the Young Men's Christian Association premises, by Mr. Taylor; the County Hotel, by Mr. Graham; the Wholesale Co-operative Stores, by Messrs. Oliver, Leeson, and Wood; and amongst the works now in progress the extensive block of buildings in Collingwood-street, also by Messrs. Oliver, Leeson, and Wood; offices for the Newcastle Breweries Company in the Haymarket, by Messrs. S. Oswald and Son. He hoped that before the close of the century the contemplated scheme for an art gallery worthy of that city will be carried out. They would soon have an infirmary erected worthy of the city, and exceedingly gratifying to them was the fact that Mr. Lister Newcombe had secured the award and the commission to carry out the work. During the last 30 years there had been no period equal to the last two or three years in developing estates within the three-miles radius of Newcastle, and the enormous number of houses that had been erected and occupied during that period; there had been about 400 acres laid out, plans passed for 3,000 houses, and about 3,600 houses had been erected, of which very few remain unlet. Coming more home to the Association work, he exceedingly regretted that the three schemes he was anxious to carry out had not been more liberally dealt with—namely, a home for the Association, a fund to secure a good library, and prizes for the students. For the former they had had a few promises. The difficulty appeared to be in not having a definite scheme to lay before friends. An association with members and associates alone numbering over 100 ought to succeed. The library and prizes did not appear to create much sympathy, although they were great auxiliaries in stimulating and training students in the great work in which they will be engaged. Many remarked "they should have sufficient interest in their work without being influenced by the prospect of gaining a prize"; but the offer of a prize not only stimulated an effort to secure, but, when secured, placed the successful student above his compeers, and thus, to use a commercial phrase, was an advertisement he could make use of in the future by stating that he gained a prize for such and such work. Then, again, the library he considered most important. The majority were better imitators than originators; therefore they should place before their students the highest works in the art, so that they could study the works and thoughts of others. He remembered thirty years ago meeting some of the students of that association who were now some of their successful architects, and who informed him that it was a rule with them to read the professional papers. He would strongly advise students to do the same, for thus many valuable suggestions were secured and carefully worked out drawings analysed. This would all tend to help on the education in the art they loved. His old master's remark was, "If you are doing anything you don't understand in construction or design, do not fail to ask for it to be explained." Students did well to remember this advice, and use every opportunity of studying the structural part of their work. At the last examination they were obliged to borrow a model. This difficulty will be removed. Feeling anxious to get the best and most suitable models to help the students, he called upon D. Brucciani and Co., of Russell-street, Covent Garden, and had selected the following works:—Lysicrates Scroll, Athens; Capital from Stone Church, Kent; Moulding Boss from St. Stephen's, Westminster; Gothic Capital from Temple Church; Acanthus Leaf from St. Eustache, Paris; small Acanthus Leaf from the Temple of Jupiter Stator; Pilaster from Notre Dame; Panel from San Nicholi, near Venice; Spandrel with Paters from Poets' Corner; four Caps Louis XII. Pilasters; which he had pleasure in presenting to the association for the use of the students. The Chairman presented books to Mr. R. P. S. Twizell, student in the senior section, and Mr. H. A. Wilson, student in the junior section of the design classes in connection with the sketching club, for successful work during the year.

Three Towns Architects.—The inauguration of the fourth session of the Three Towns branch of the Devon and Exeter Architectural Society took place on Wednesday week at the School of Art, Princess-square, Plymouth. Amongst those present were Mr. Charles King, F.R.I.B.A., president of the parent society; Mr. Henry Geo. Luff, A.R.I.B.A., the newly-appointed chairman of the branch, and Messrs. W. H. May, M.S.A., A. S. Parker, A.R.I.B.A., L. H. Dwelley, R. A. Mill, W. N. Richards, and B. Priestley Shires, A.R.I.B.A., hon. secretary and treasurer of the branch. Mr. Luff, chairman, delivered his opening address. It is very gratifying, he said, to know that so many members of the profession have joined our ranks, but it would be much more so if every remaining *bonâ-fide* architect living amongst us would do likewise; then there may be a better chance of our influence as a body carrying more weight on all questions affecting our professional position. As to the question of registration, I hope that it may soon become a matter of law. Personally, I am sorry that the Institute has opposed the Bill so far, considering how successful the examinations instituted by that body have proved for some years past, and it appears to me especially hard upon those men who have passed the ordeal of those examinations that on their starting a practice they should have to compete with irresponsible people who have never had so much as one day's professional education. As soon as the particulars of the competition for the Plymouth Institution in George-street were issued, your committee was at once called together to discuss the conditions, when it was thought necessary to suggest certain alterations to the same, and I am pleased to say that most of what appeared to us as essential points for alteration were promptly acceded to by the institution committee. I understand that a member of our society has been successful in gaining this competition. Mr. King, in proposing a vote of thanks to Mr. Luff for his able address, said the question of registration of architects was in the hands of the architects themselves, and should be pressed forward at every available opportunity. Mr. Parker seconded, and Mr. W. H. May, in supporting, hoped that all provincial architectural societies would band themselves together and bring about as speedily as possible the desired end of registration of architects. Mr. Luff, in thanking them for their kindly appreciation of his services, hoped that some definite step as regards registration would soon be brought about. Mr. Edmund Sedding will address the members at their December meeting on the subject of "Cornish Granite Work."

Slate Merchants' Congress.—The seventh annual congress of the National Association of Slate Merchants and Slaters was held on Wednesday, at Liverpool. Mr. Clement Brady, president of the association, in the chair; and delegates were present representing many districts of England and Wales. The Lord Mayor welcomed the members of the association to Liverpool, and afterwards various matters affecting the slate trade were discussed. The president, in his address, stated that the association was increasing its membership, and now included about three-fourths of the slate trade of England. The hope was expressed that an effort would be made to federate all national associations of the building trade employers into one organisation.

* * *

At Tring, the old cottage-like market-house is being replaced by a new one, with corn exchange above. The buildings are of timber and plaster work, with tiled roofs and a belfry. Over a market-place 40ft. by 20ft. and 12ft. deep is a corn exchange carried on oak posts. This upper story, approached by an oak staircase, is timber-framed, and Elizabethan in style. Mr. Huckvale, of Tring, was the architect, and the cost has been £2,400.

Loweswater Church has been fitted with the latest improved "small tube" hot water heating apparatus by John King, Limited, engineers, Liverpool, employing their special economical coil heater.

A new infirmary and laundry are about to be added to the workhouse buildings at Cheadle. The architect is Mr. J. T. Snape, of Newcastle-under-Lyme, and the estimated outlay is £6,400.

The Earl of Derby laid the memorial-stone in connection with the rebuilding of St. Peter's Church, Bury, Lancashire, on Saturday, and contributed £1,000 towards the restoration funds. Mr. Medland Taylor, of Manchester, is the architect.

In consequence of the incomplete nature of the water-colour sketches of "St. Andrew" and "St. Patrick" left by the late Mr. Albert Moore, the president of the Royal Academy (Sir Edward Poynter) has undertaken, at the request of Mr. Akers-Douglas, to prepare fresh cartoons for reproduction in mosaic in the two remaining vacant panels in the Central Hall of the Palace of Westminster. The delay, which is thus inevitable, will render it impossible for the work to be completed, as was originally hoped, before the reassembling of Parliament in 1900.

Foundation-stones of a new Wesleyan Chapel were laid at Seaton Burn on Saturday. The architect is Mr. Stuart M. Mould, of Pilgrim-street, Newcastle-on-Tyne. The design is a free treatment of Early English. The building is seated for 270 worshippers, including schoolroom, which is made to cut off from the church by a partition. There are two vestries and a kitchen and heating-chamber under. The contractor is Mr. Amos Gray, of Wideopen, while Messrs. Dinning and Cooke are contractors for the heating, and the School Furnishing Company for the seating.

Mr. S. W. Lathom, architect, has been elected surveyor to the Kinsbridge feoffees in the place of Mr. J. E. Adams, deceased.

Building Intelligence.

Omagh.—The opening ceremony in connection with the new County Tyrone Infirmary at Omagh took place on the 16th inst. It stands on an elevated site just outside the town. The ground floor consists of a porch and entrance hall leading to the central corridor, on the north of which are placed the kitchen, matron's store, staircase, male, female, and nurses' dining-rooms, ward kitchens, and sanitary blocks. On the south side are the dispensary, board and doctor's room, and a large ward for twelve beds at each end. The general arrangement of the first floor is the same, and it contains an operating-room, with operation ward attached, private and children's wards, and matron's room, in addition to two large wards. At the top of the building are the bedrooms and bathroom in the projecting wings. The kitchen, scullery, and cook's stores are placed centrally near to the staircase. The hospital was erected from the plans of Mr. C. A. Owen, architect, of 29, Molesworth-street, Dublin, and the contractor was Mr. Joseph Colhoun, of Derry.

Glasgow.—Formerly the policy of the Baths and Washhouses Committee of Glasgow Corporation was to erect baths on a large scale, with extensive public washhouses attached. It has now been decided to provide smaller and more numerous establishments. In accordance with this idea washhouses have been equipped in the St. Rollox and Hutchesontown districts, and others have been planned. On Tuesday a third establishment, situated in Stobcross-street, was formally opened. This washhouse is built on ground which in ordinary course would have been utilised as the courtyard for Improvement Trust tenements erected on the street front. By making a concrete flat roof over the washhouse the courtyard space is preserved, while the corporation make double use of the ground. There are fifty-six wash-stalls in the establishment, the equipment of each stall including steam-drying apparatus. The wringing is done by water-driven hydro-extractors. The washhouse, which has cost about £6,000, has been constructed under the superintendence of Mr. M'Donald, city engineer.

Lancashire Asylums.—Important proposals for enlarging and improving these institutions are to be brought before the Lancashire Asylums Board at their next meeting. They include: £1,337 for erecting, fitting-up, and furnishing a laboratory and museum, for pathology and bacteriology at Lancaster Asylum; £4,400 for erecting additional wards to the Female Hospital at Lancaster, and for fencing; £3,500 for the proposed extension of the boiler house and boilers at the annexe at Rainhill; £900 for heating the female side of the annexe at Rainhill; £6,000 for altering and relaying the drains and treating the sewage at Whittingham: £7,000 for new farm buildings at Winwick Asylum; and £4,200 for the extension of the railway siding at Winwick.

Weston-super-Mare.—In the place of the Wesleyan Chapel, in Regent-street, a new building is being erected in the Station-road, and the ceremony of stone-laying took place on Monday. The church will provide accommodation on the ground and gallery floors for about 900 persons. The style is Decorated Gothic, with traceried windows of Bath stone, filled with leaded lights. The front of the church faces Station-road, and at the north-west corner will be a tower, with spire rising to a height of 120ft. The building will consist of nave, transept, chancel, minister's vestry, and organ chamber on the ground-floor, and a gallery on three sides of the church. The interior woodwork of pews, gallery, and waggon-headed roof will be pitch-pine varnished. The total cost of the building will be about £5,600. The architect is Mr. W. J. Morley, F.R.I.B.A., of Bradford, whose design was selected in competition, and the contractor is Mr. William Gibson, of Exeter.

* * *

The Lancaster Town Council have unanimously approved the report of the special committee appointed to consider a tramway scheme for the borough, recommending that powers be asked for in a Parliamentary Bill to introduce electric tramways on the overhead trolley system in the borough, the estimated cost being £70,000. The principal streets in the town will all be comprised in the scheme, besides the suburbs and Williamson Park; in fact, there will be a network of tramways.

Engineering Notes.

The New City Subway.—The important subway beneath the crossing between the Mansion House, the Bank of England, and the Royal Exchange is approaching completion. Forming an irregular oval, the subway is approached by seven independent staircases—two from the pavement in front of the Royal Exchange, one from the footpath in Lombard-street, opposite the premises of the Globe Insurance Company, one in Mansion House-place, one in Walbrook, one at the corner of Queen Victoria-street, and one at the corner of Princes-street, in front of the Union Bank. Three of these staircases are in duplicate, one flight for going down and the other for coming up. The principal entrances to the subway opposite the Royal Exchange are 10ft. wide. The subway, 15ft. wide and 10ft. high, runs round a large central hall, in which will be placed the booking-offices of the Central London Railway. Five shafts, lined with cast-iron plates, rise to the booking-hall from the platforms of the Bank Station. These shafts, 60ft. deep, are to be fitted with lifts supplied by the Sprague Elevator Co., of New York. The smallest will carry 50 persons and the largest 100, and all will be worked by steel ropes passing at the bottom round a drum driven by electricity. A steel trough roof covers the subway, and laid on the steelwork is a bed of concrete 2ft. thick, with a layer of asphalte for the surface pavement. In the centre the roof rests on steel girders and columns, while at the side it is maintained by brick walls bedded in concrete. The walls of the subway, like those of the approach staircases and the tunnel leading to the City and Waterloo Railway, are lined with white tiles, and incandescent electric lamps are suspended from the centre of the roof. The undertaking has been completed without serious interruption of the street traffic, notwithstanding the fact that the whole of the extensive area affected has had to be excavated to a considerable depth; and a dense network of pipes, tubes, and cables had to be dealt with and reconstructed in a lower subway. Below all was a sewer of the London County Council, 8ft. wide and 7ft. high. This large brick drain could not be diverted, and the engineers decided to allow it to run between two of the shafts in which the Central London Railway lifts will work. The position of all other obstacles has been changed, and every pipe, tube, and cable intersecting the site is now carried in the lower subway. The City and South London Railway will soon open its new Bank station in Lombard-street, built from Mr. Sidney R. J. Smith's designs, and it is intended eventually to connect by passages the three electric lines which will converge below the subway—the Central London, the Waterloo and City, and the City and South London. The subway has been designed and carried out under the superintendence of Mr. Basil Mott, of the engineering firm with which the names of the late Sir John Fowler and Sir Benjamin Baker are associated.

Sunderland.—The North Eastern Railwa Company will seek powers next session for th erection, in collaboration with the Sunderlan Corporation, of a new railway and passenger bridge across the river Wear. The scheme includes the construction of a high-level lattice-girder bridge, and the lines to connect it to the existing railways on the north and south banks of the Wear. Starting from the Hylton, Southwick, and Monkwearmouth line about 230 yards east of the culvert carrying Alyton Dene burn under that line, it goes, in the first place, to the east side of Wear-street, north of Crown-road, Southwick. Thence "railway No. 2"—the bridge section—takes the scheme from Southwick across the Wear to Havannah-street, about 30 yards west of Charles-street; and a third section joins that just named to the Penshaw branch of the North-Eastern about 200 yards north-west of Millfield Station. Widenings of the Penshaw branch in Ford parish and east of Pallion Station are also needed. The length of line and bridge will be about 1½ miles. The bridge itself will have four spans—one of 300ft., and three of about 180ft. each; and then there will be archways of the usual type afterwards. The railway will be borne on the top of the bridge, the roadway underneath. The cost of the railways and bridge may be roughly put at about £400,000. There will be two sets of lines on the bridge. The plans are by Mr. C. A. Harrison, engineer to the North-Eastern Railway.

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ILLUSTRATIONS.

PLUMSTEAD MUNICIPAL BUILDINGS AND PUBLIC LIBRARY.—COTTAGES AT GIFFNOCK AND HOUSTON CROSSLEY.—PRESBYTERIAN CHURCH AT CUSHENDALL.—PULPIT, ETC., IN CONGREGATIONAL CHURCH, EXETER.—MIDLOTHIAN COUNTY BUILDINGS, EDINBURGH.

Our Illustrations.

PLUMSTEAD MUNICIPAL BUILDINGS AND PUBLIC LIBRARY.

LAST week we illustrated all of the three premiated designs for this comprehensive range of buildings, and we gave their authors' descriptions of the various schemes. To-day we complete the matter by publishing the elevations of the first and second prize designs. Both of these, we think, look better in geometric elevation than in perspective; and, although they differ so much in the ideals adopted, it is very interesting to contrast and compare Mr. A. Brumwell Thomas's façade with the picturesque composition submitted by Messrs. Hall, Cooper, and Davis. The plans appeared last week.

COTTAGES AT GIFFNOCK AND HOUSTON.

THE cottages at Giffnock are built of red sandstone on ground floor with brick and rough cast over. This will give a contrast in colour. The cottages at Houston, for the South-Western Property Co., Ltd., are built entirely of brick and rough cast. In and around Glasgow there is a strong prejudice against brick being used in the external walls of a house; but, owing to the price of stone being so high at present, builders and others are asking for a substitute. One only requires to visit the suburbs to find what a lack of colour and sameness there is amongst the houses. It is to be hoped that brickwork will soon find its true position in domestic architecture in Scotland. The architects are Messrs. Watson and Salmond, St. Vincent-street, Glasgow.

CONGREGATIONAL CHURCH FURNITURE, EXETER.

As mentioned in our issue of Oct. 30, this building was recently opened at Exeter. We give this week sketches of the Pulpit, Reading Desk, and Communion Table, all of which are Perpendicular in style, and were executed by Messrs. Harry Hems and Sons, of Exeter, from the designs of the architect, Mr. Harbottle Reed, of the same city.

MIDLOTHIAN COUNTY BUILDINGS, EDINBURGH: FIRST PREMIATED DESIGN.

IT will be remembered that the committee in charge of the recent competition for this important work declined to confirm the award made by the referee, Mr. W. W. Robertson, of H.M. Board of Works, who was appointed as the assessor before the designs had been prepared. We have already published the design which was selected by the council after Messrs. Honeyman and Keppie, of Glasgow, had been consulted as to its suitability. That design was placed fourth by Mr. Robertson. It bore the mark of "Rab," and its author, Mr. Macintyre Henry, kindly lent us his drawings, which will be found illustrated in the BUILDING NEWS for Nov. 10. To-day we give the plans and view of the first premiated design. Its motto was "A Moi," and its authors were Messrs. J. N. Scott and A. Lorne Campbell. These architects arrange the chief entrance to their building on the west to Melbourne-place, as this is undoubtedly the most important frontage, having neither the disadvantage of the congested traffic at the High-street front, nor the awkward incline of the roadway of that to Parliament-square, where, however, a subsidiary entrance is located, leading to the grand hall. Entering by the principal doorway from Melbourne-place, the inquiry office is conveniently situated at the upper end of the ample vestibule, through which the grand hall is reached. The hall is lofty and well lighted, and from it ready access is obtained to the various departments. To the left upon entering is situated, in close proximity to the street, as required for the convenience of the public, the department of the collector of rates, consisting of a public office, private room, and storage accommodation. Adjoining is the suite of rooms for the use of the medical officer. To the right, access is obtained by means of a spacious corridor to the departments of the chief of police and the justice of the peace clerk, as also to the general court-room accommodation, with which both of these departments are closely associated. Returning to the grand hall, the first floor is reached by means of a handsome bifurcated staircase situated immediately opposite the main entrance, and upon this floor are placed the council chamber and its adjuncts. The landing is spacious, and the public entrance to the council chamber, which is provided with an arrangement of double doors for the exclusion of noise, is a central and unmistakable feature. On the left of the landing is an entrance to the southern wing of the main building, which is upon this floor entirely occupied by the various rooms devoted to the work of the council and the convenience of its members, who are by this arrangement entirely cut off from the ordinary traffic of the building. On the right is the department of the county clerk, conveniently situated in relation to the council chamber. The southern wing upon this floor is devoted to the departments of the road surveyor and sanitary inspector. The north wing is occupied by the house of the caretaker. In the basement accommodation is provided for the inspector of weights and measures, there being an entire absence of vibration, while a ready access is obtained both from Parliament-square and the grand hall. Upon this floor also are situated the strong rooms provided for the various departments. In order to insure the better lighting and ventilation of the strong room corridors, fixed steel grills are placed at the open ends, that contiguous to the quarters occupied by the resident police affording an excellent means of surveillance. In order to reach these strong rooms a private staircase is provided for official use. The heating chamber, with ample coal-cellar accommodation attached, is also situated upon this floor, and a coal-hoist is provided by means of which the coal may be delivered upon each floor in an inconspicuous position. Ample lavatory accommodation is provided throughout the entire building. The police department is confined to the lower building at the southern extremity of the site. As previously indicated, the entrance for the general public is from Melbourne-place, and gives access to a public corridor, which runs the whole width of the building, lighted by a large window at its further extremity, and also by means of a domed light placed at the junction formed by the corridor of the main building, which it also assists to light. From this corridor the public has access to the court-room, and the witnesses to a subsidiary corridor reserved for them, and off which the male and female witnesses' rooms enter. A private entrance for the officiating justice is provided from Melbourne-place, by means of which the room reserved for him is reached. This room has direct access to the Bench, and is provided with convenient lavatory accommodation. The court-room itself is situated in the quietest portion of the building, is lofty, and well-lighted by means of a large ceiling-light, which will give a diffused and equal illumination. The resident sergeant of police is provided with house accommodation over the front part of the building. Entrance is obtained to this floor by means of a doorway from the passage off Parliament-square, the width of which is somewhat increased. On the left of the entrance is the charge office, which in turn communicates directly with the cell corridors, from which a door communicates almost directly with the stair to the dock. On the right is provided a room for the detective officers. To the front and near the entrance is the muster-room, and adjoining it is the heating chamber of this department. The southern portion of the basement of the main building is occupied by the quarters of the resident constables and the clothing store. Lavatory accommodation is also provided upon this floor for the use of the constables and such of the public as may be in attendance upon the court. There are two entirely separate heating systems in connection with the building, one for the main block and one for that portion of the buildings reserved for police purposes. The ventilation will be by means of extraction, shafts being led from the various departments to an electrically driven fan placed in the roof. Fresh-air inlets will also be provided, placed in such positions that the air may travel through the radiators. In considering the elevations, one style only would, it was thought, be suitable for a building in this position—namely, the Later Renaissance, the key-note of which is struck by the Signet Library and other adjoining buildings, and it is in this style that the design has been carried out. A primary consideration also was as to whether the existing portico should be rebuilt or not, and the decision arrived at was that, excellent as it is in itself, its re-erection would undoubtedly hamper the designing of satisfactory elevations, as, on account of its immense proportions, the fenestration and other details would require to be designed on a similar scale, with the result that sufficient lighting for the great variety of apartments required could not be obtained without producing a building altogether out of scale with its surroundings. The grand hall has a plaster ceiling divided into sections by means of massive beams, each section being treated with flat groining. The walls are partly panelled in wood and treated with pilasters supporting the beam ends, while the free pillars at each side of the grand staircase are of polished stone. The external walls will be of polished stone backed by rubble, while the floors throughout the building will be of fireproof construction, those in the principal public apartments being treated in oak, while the grand hall and principal corridors will be laid with mosaic or other such paving material. The staircases throughout will be of stone, and a combination of iron and wood will be used in the roof construction, the corner turrets being supported by means of strong concrete vaulting, thus avoiding the necessity of complicated beam construction. The estimated cost has not reached us.

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CHIPS.

Mr. Robt. Clamp, A.R.I.B.A., of Woking, has taken into partnership Mr. J. B. Drower, late of Nottingham, and the practice will in future be carried on by them at their new offices, Victoria Chambers, Woking, and also at Fleet, Hants, under the style or firm of R. Clamp and J. B. Drower, architects.

Lord Glenesk, chairman of the Chelsea Hospital for Women, Fulham-road, held a reception at that hospital on Tuesday, in order that visitors might inspect the alterations and improvements which have recently been carried out. To meet modern requirements at the hospital, alterations and improvements, consisting of an enlarged operation theatre and new sterilising department, an electric-light installation, an electric lift, a hot-water service, and the repainting of the hospital, have now been carried out at a cost of £3,000. The work has been carried out under the direction of Mr. William Emerson, P.R.I.B.A., a member of the council of the hospital, whose services as honorary architect were acknowledged by Lord Glenesk in the course of his address.

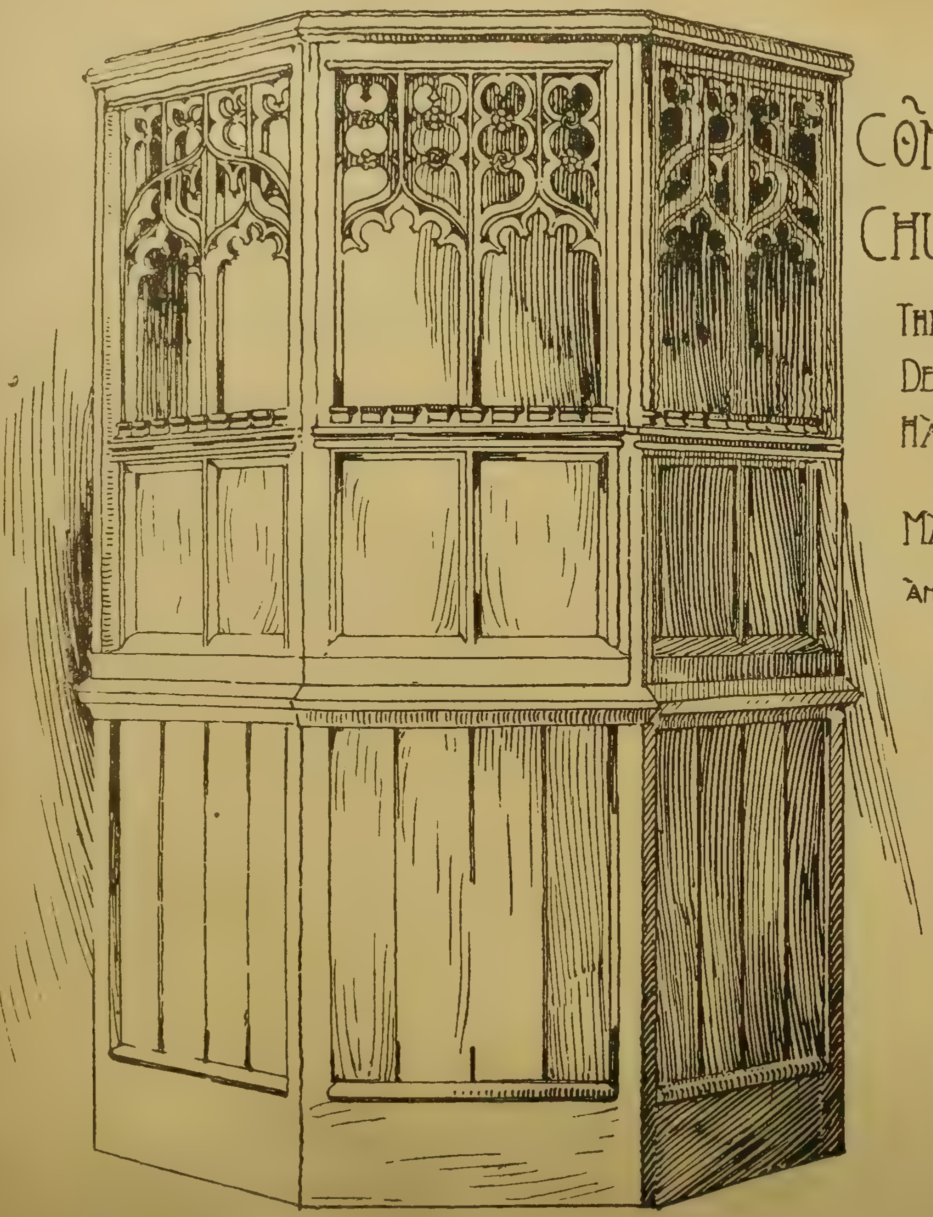
The new branch school of art (in connection with the Birmingham Municipal School of Art), erected on the Moseley-road, was formally opened on Saturday. The building, which will provide accommodation for 300 students at one time, has been both planned and finished with the view to its practical usefulness, and no money has been lavished on decoration. The total cost of the school is about £6,500.

There has been received by the Insanitary Property and Artisans' Dwellings Committee of the Liverpool Corporation a letter from the assistant secretary of the Local Government Board inclosing the formal sanction of the board to the borrowing by the city council of £40,000 for the purposes of the Liverpool Sanitary Amendment Act, 1864, and section 79 of the Liverpool Improvement Act, 1882.

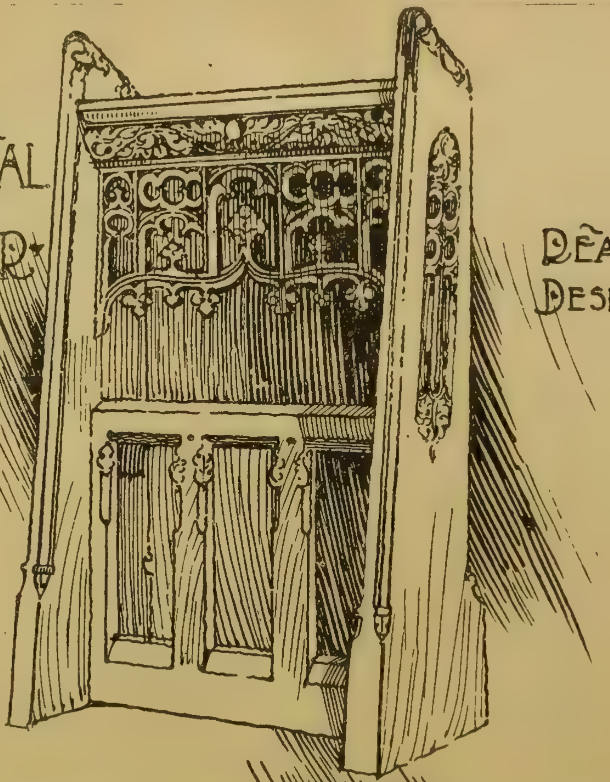
CONGREGATIONAL CHURCH • EXETER •

THE FITTINGS • • •
DESIGNED BY MR
HARBOTTLE REED

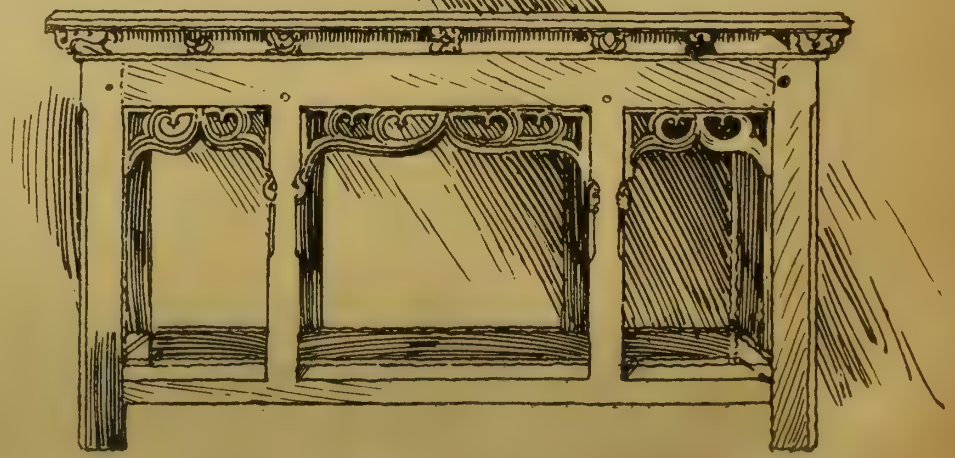
MADE BY MESSRS HEMS
AND SONS • • •



• THE PULPIT •

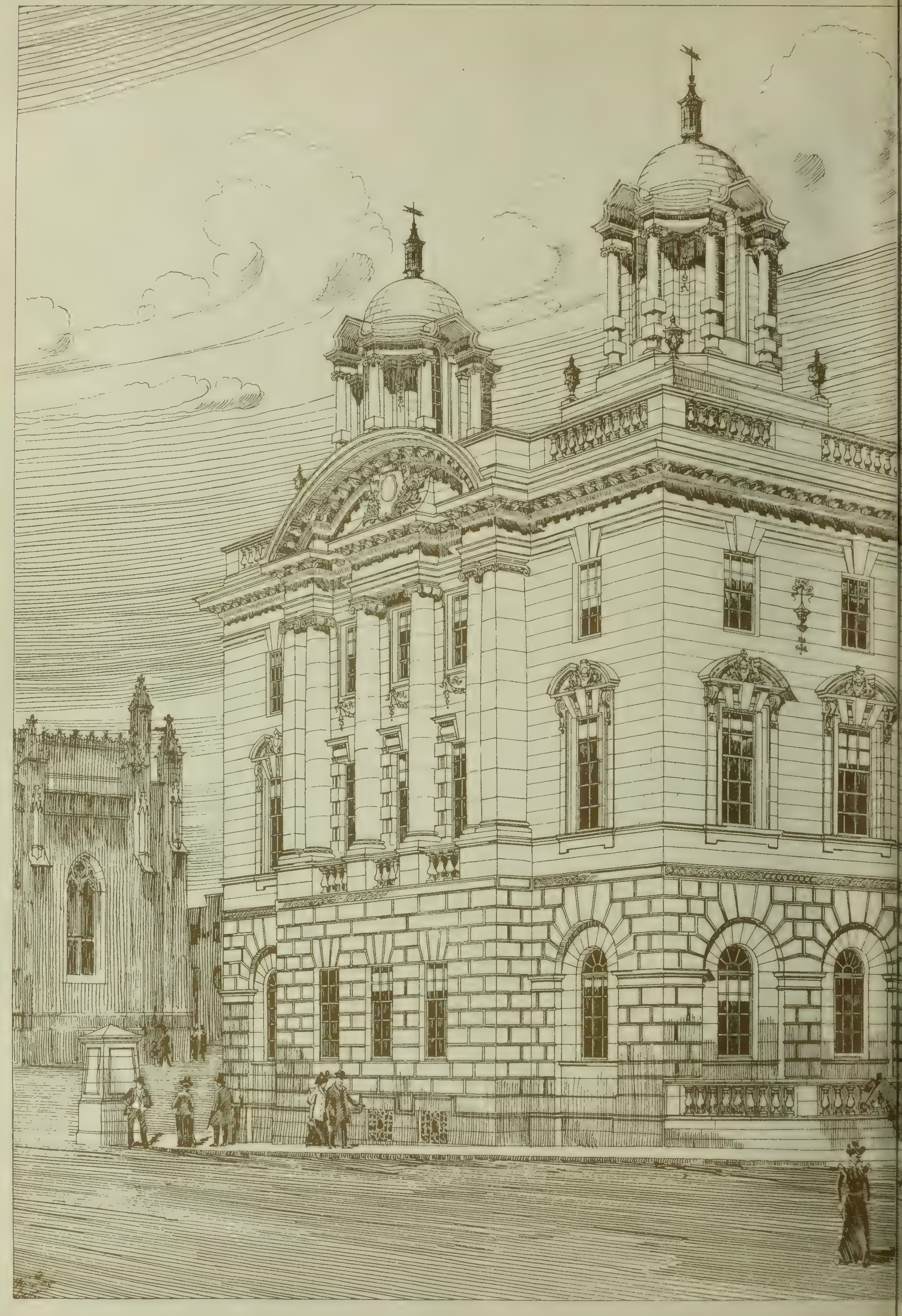


READING DESK • • •



• COMMUNION TABLE •

Walter J. Wells del.



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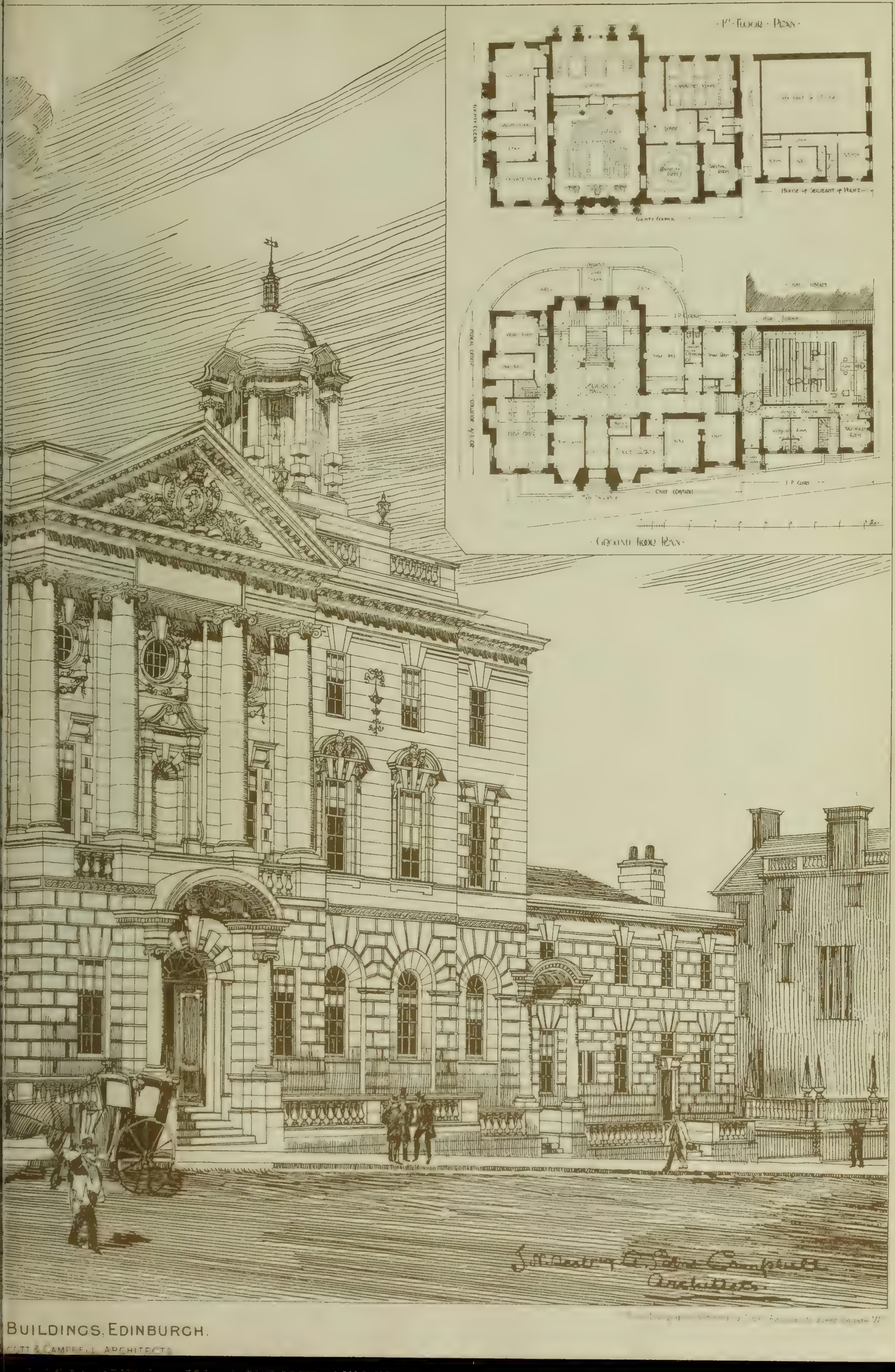
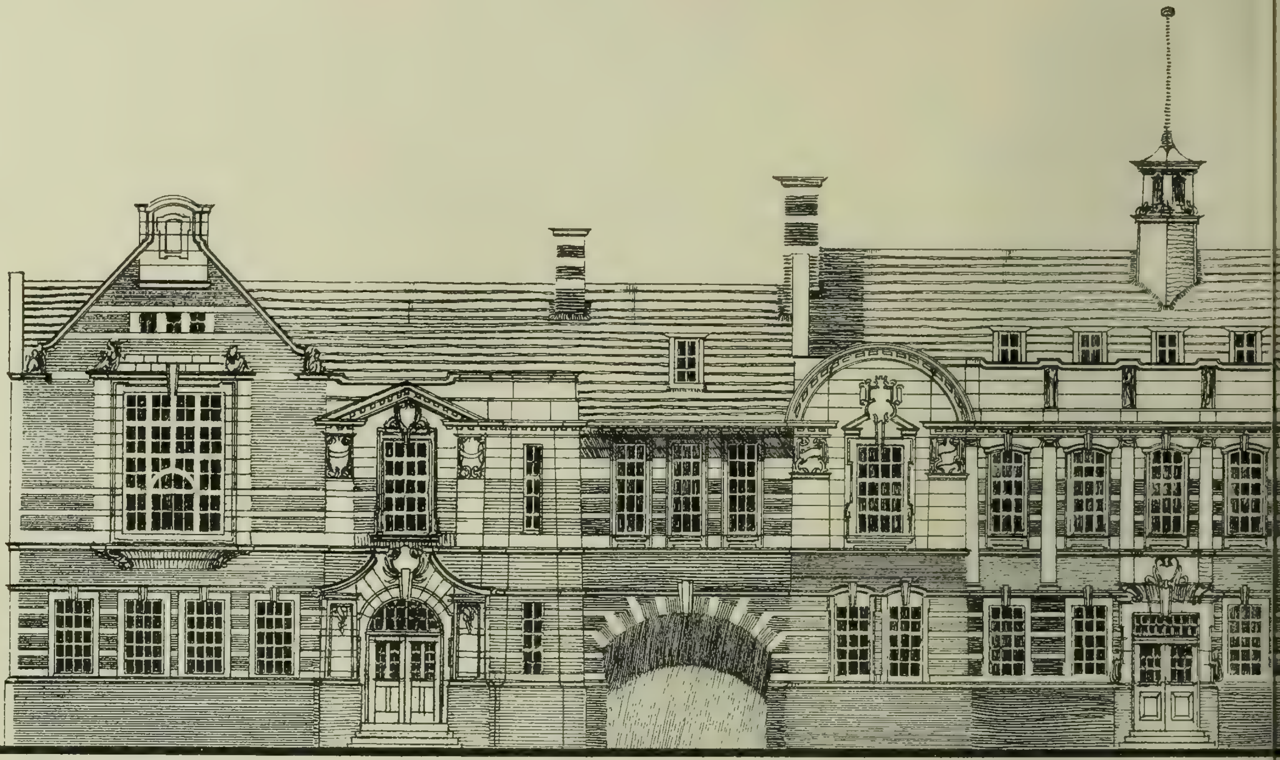


R BUILDINGS, EDINBURGH.

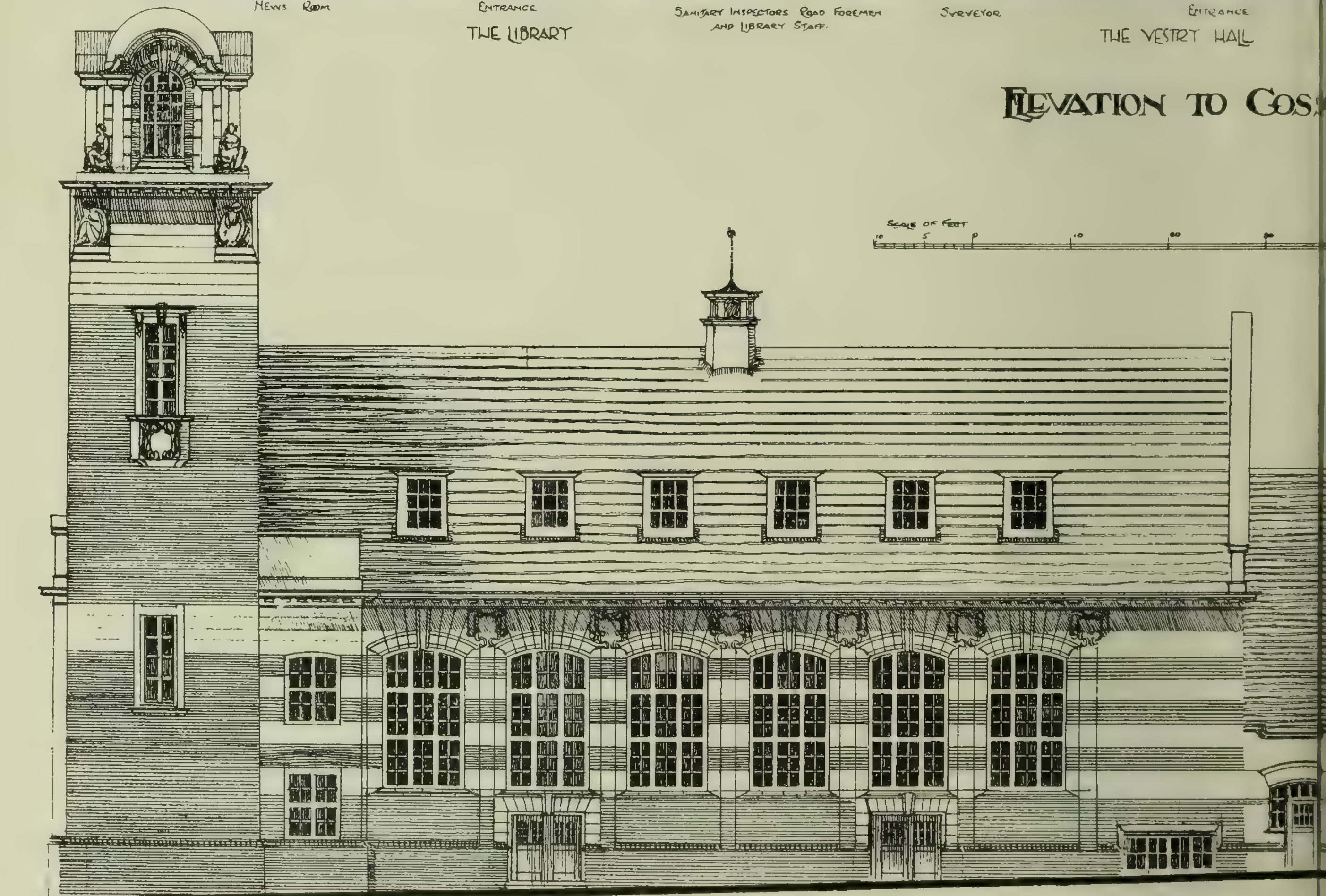
COTT & CAMPBELL ARCHITECTS

PUBLIC LIBRARY AND MUNICIPAL BUILDINGS, PLUMSTEAD.

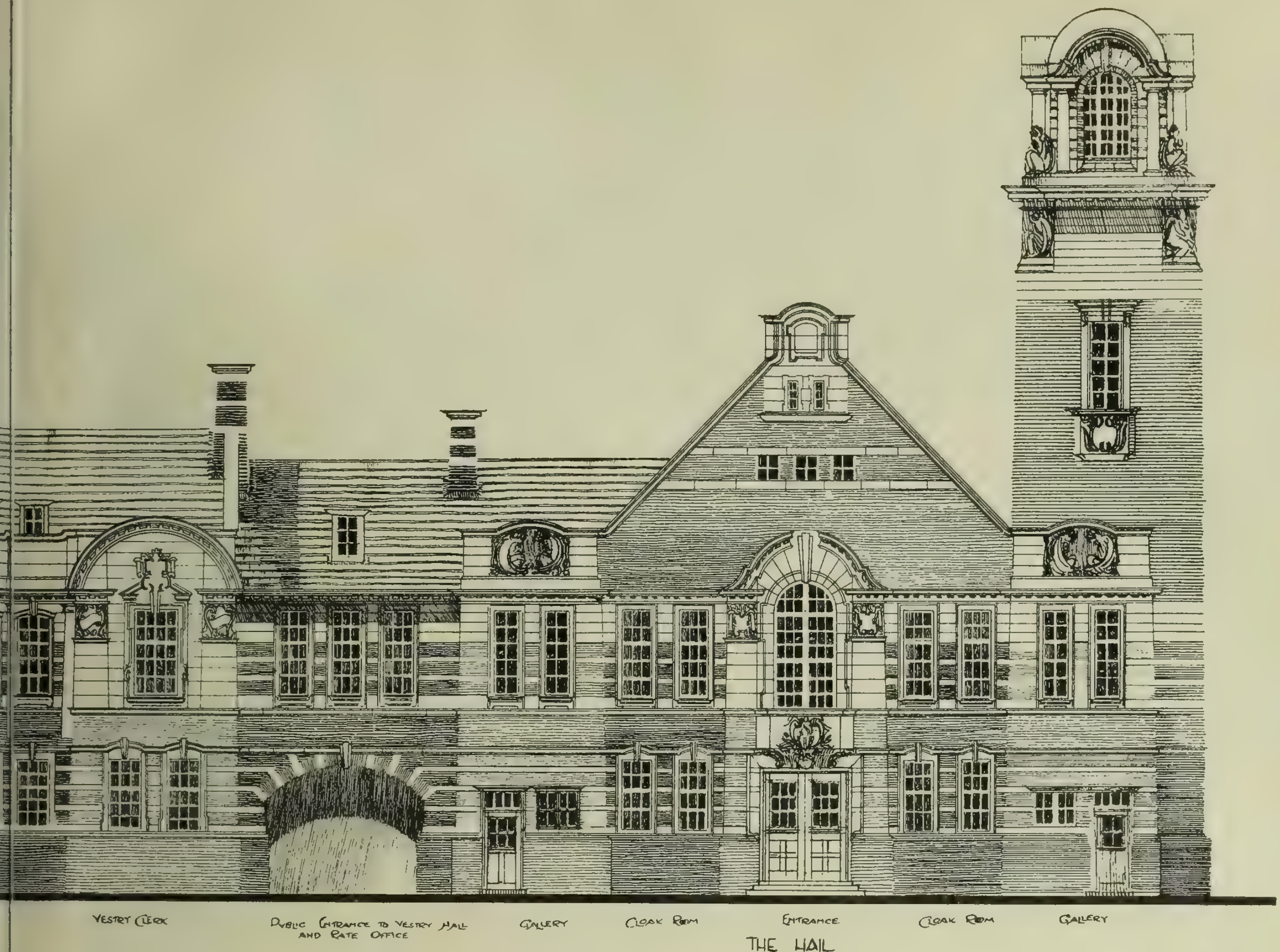
SECOND PREMIATED DESIGN, HALL COOPER & DAVIS, ARCHITECTS



ELEVATION TO GOS



ELEVATION TO PARK ROAD



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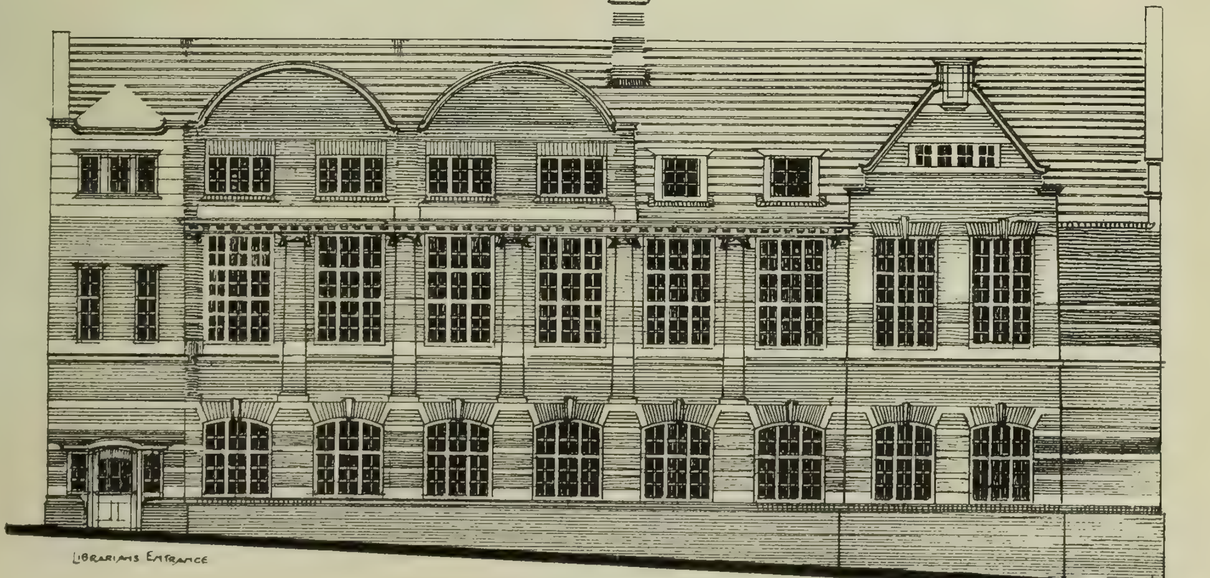
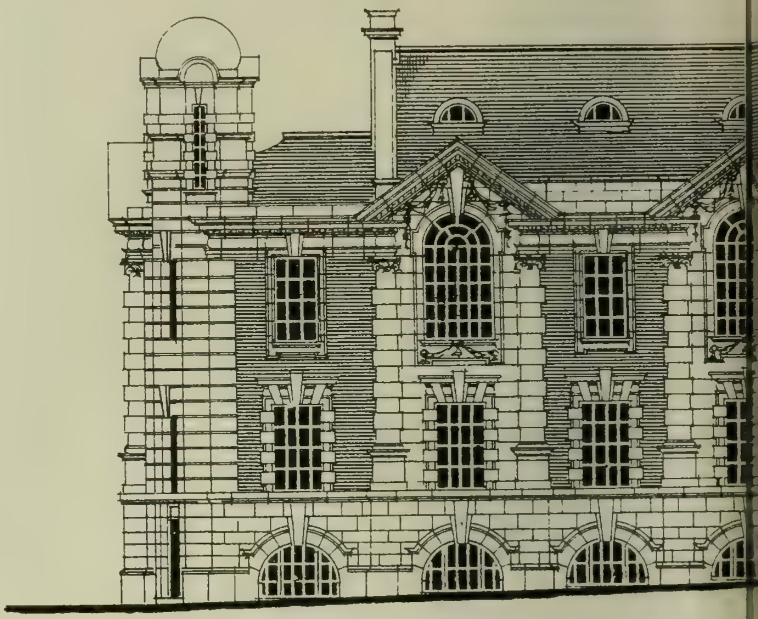


ELEVATION TO ANCONA ROAD

Photo Lithographed & Printed by James Akerman, 6 Queen Square, W.C.

PUBLIC LIBRARY AND MUNICIPAL BUILDINGS, PLUMSTEAD.



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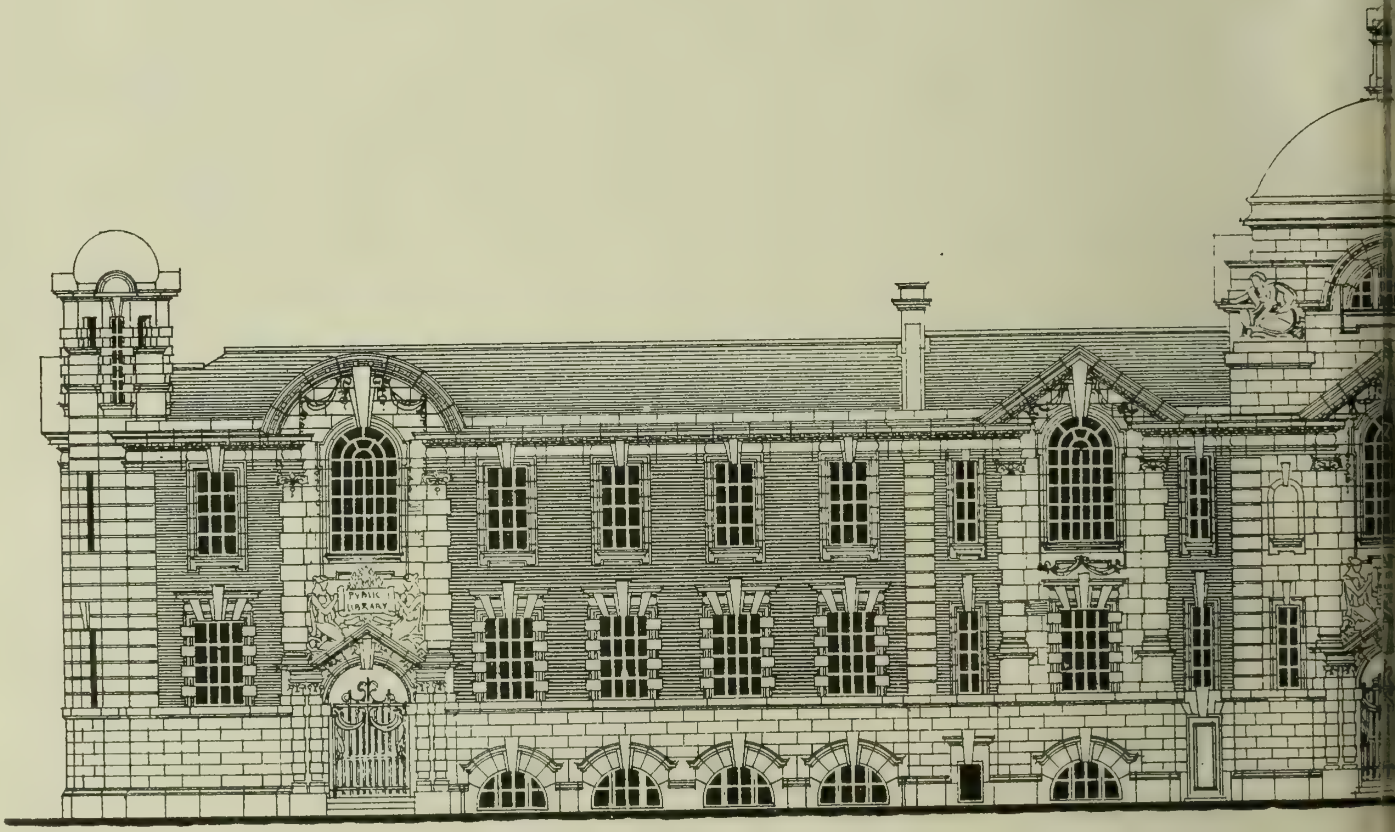
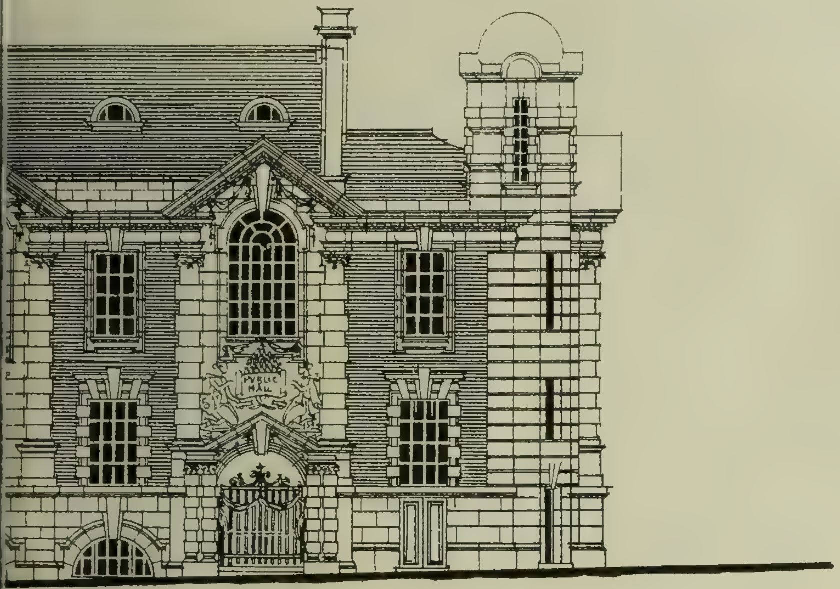


ELEVATION TO

SELECTED DESIGN, A. BRUMWELL THOMAS, ARCHITECT.



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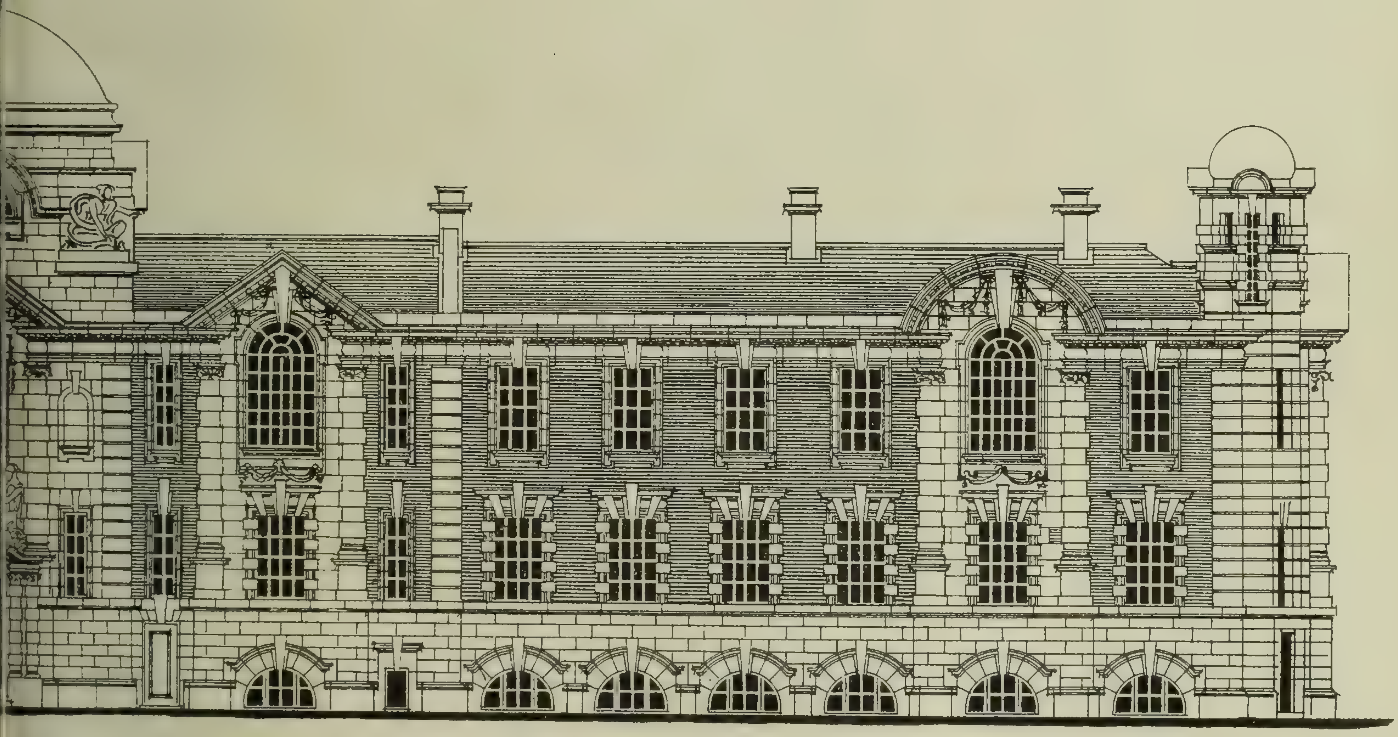
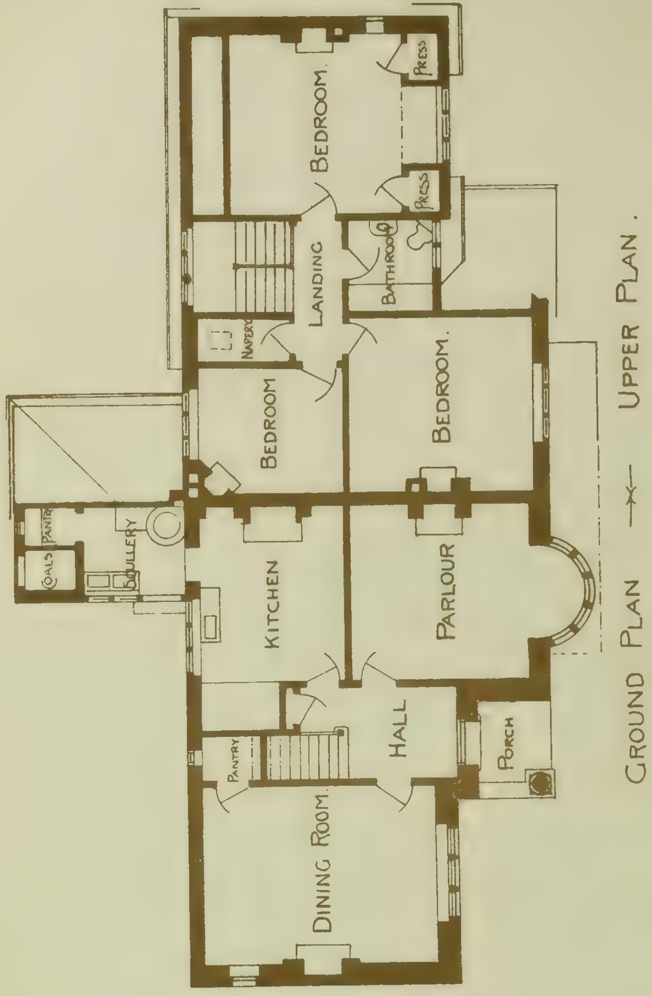
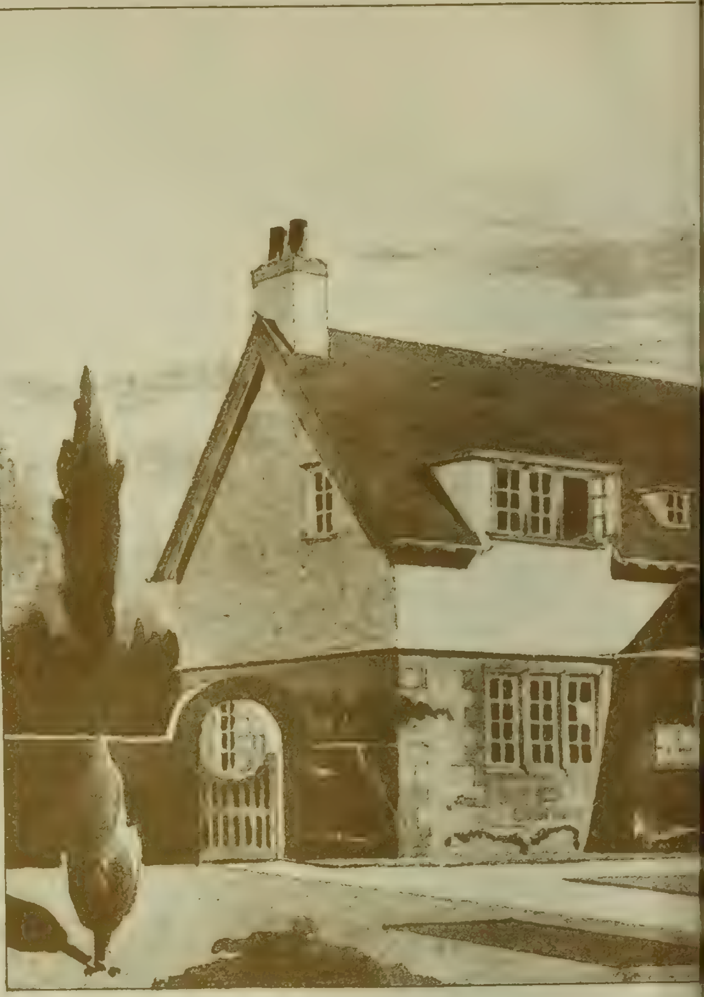


SSAGE ROAD.

Photo-Lithographed & Printed by James Akerman 6 Queen Square, W.





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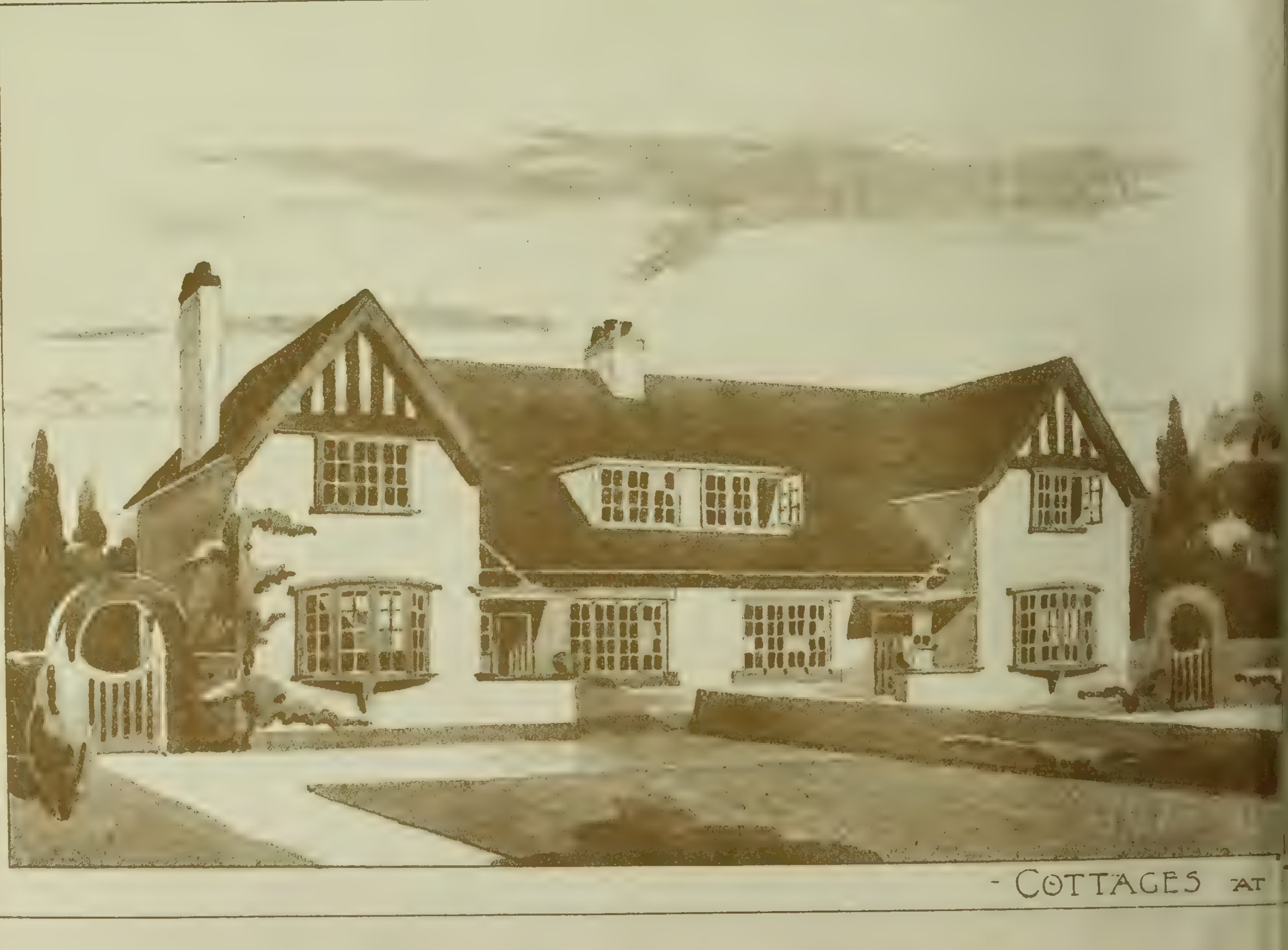

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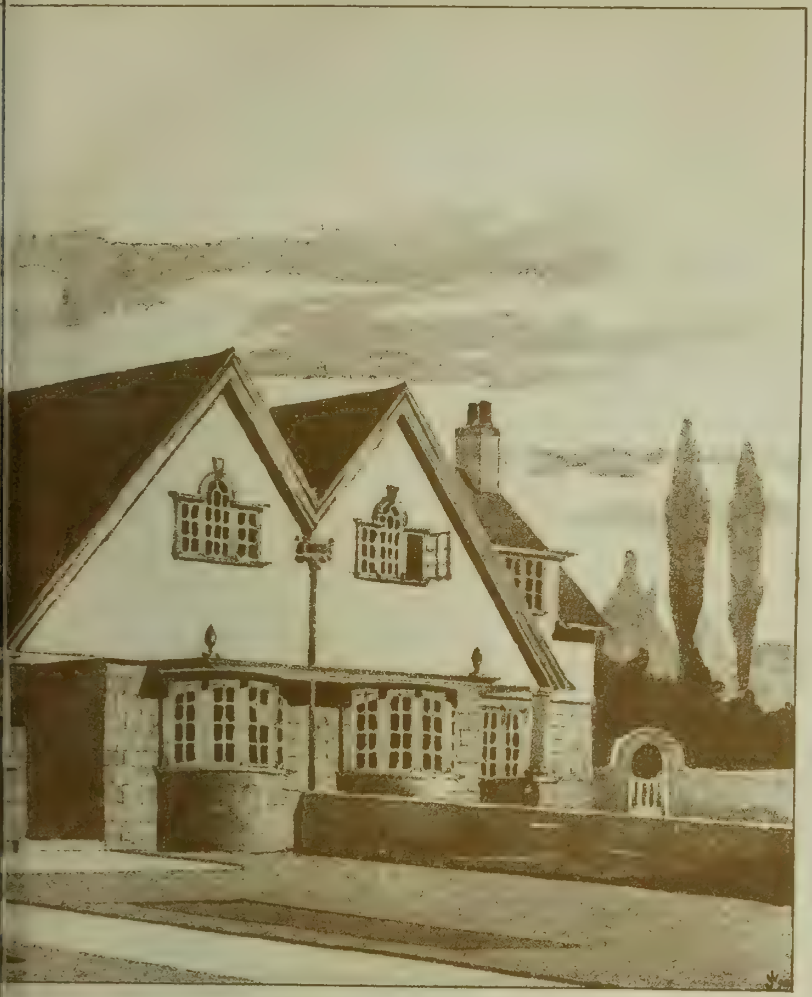
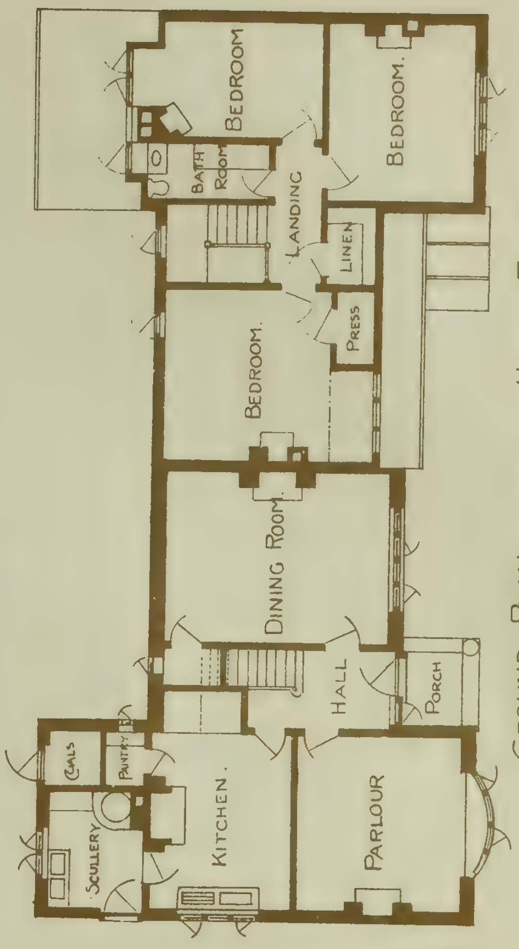
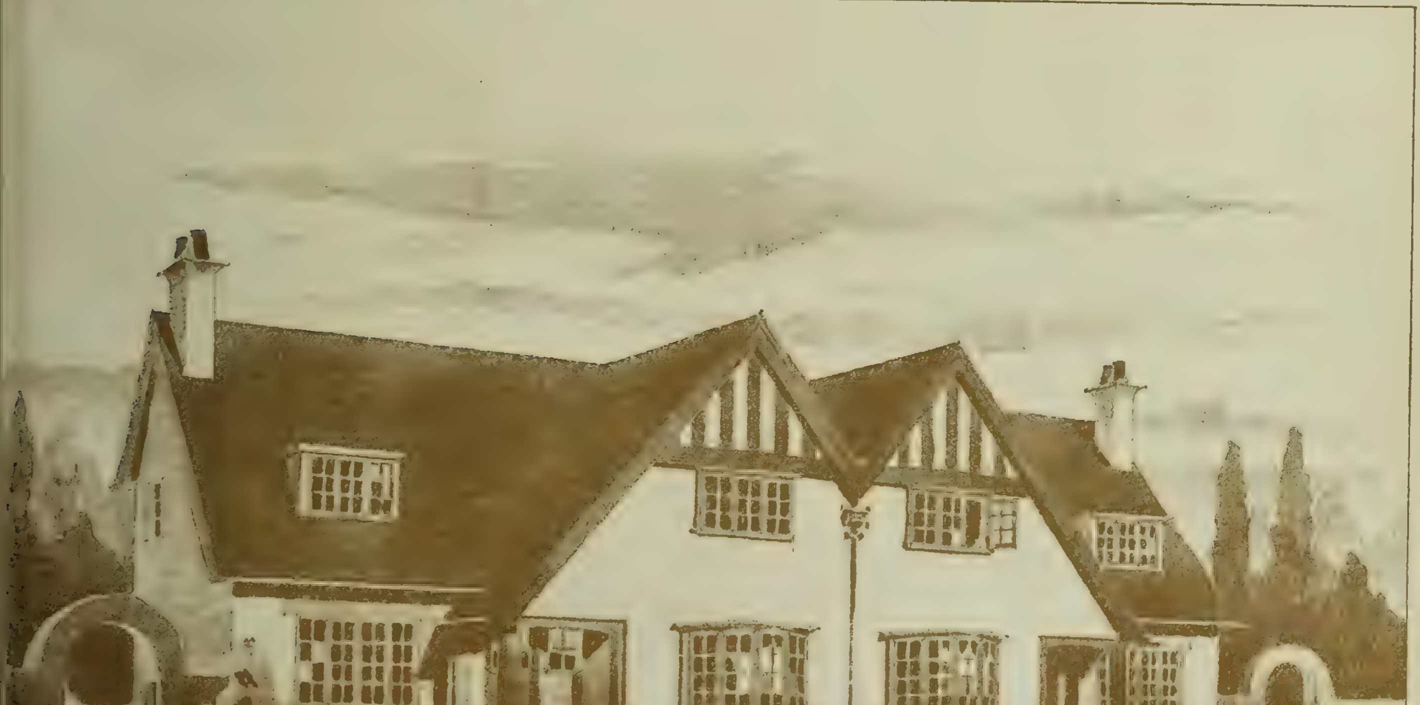


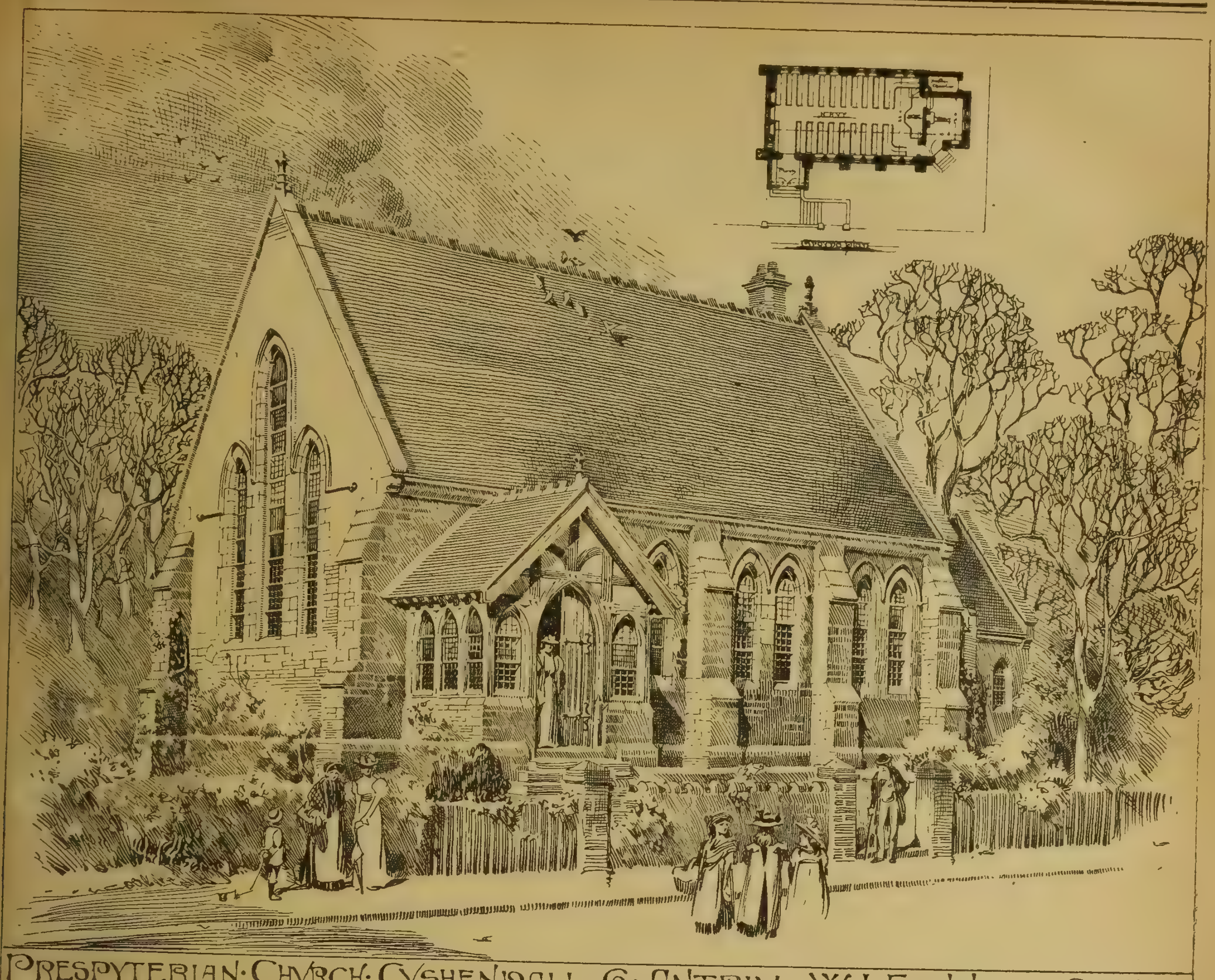


WATSON AND SALMOND ARCHTS ·



STON CROSSLEY·

"PHOTO-TINT," by James Akerman, 6, Queen Square, London, W.C.



PRESBYTERIAN· CHVRCH· CVSHENDALL· Co· ANTRIM · W· J· FENNELL· ARCHT·

PRESBYTERIAN CHURCH, CUSHENDALL.

THIS church is now in course of erection, the foundation-stone having been laid in September by the Rev. Dr. Taylor, Moderator of the General Assembly. The walls are rock-faced ashlar, and the dressings chiselled of local sandstone. The work is being carried out by Mr. Hugh McCann, builder, of Ballymena, from the designs of Mr. William J. Fennell, architect, of Belfast.

CHIPS.

The members of Aberdeen District Lunacy Board on Saturday visited the lands of Rainnieshill and Kingseat, Newmachar, measuring altogether about 1,700 acres, purchased recently for about £33,000, it being proposed to erect on this site a new asylum for the lunatic poor under the charge of the board.

The Local Government Board have approved a scheme of the London County Council for providing accommodation on the Chapel-grove and Eastnor-place area, in the parish of St. Pancras, for at least 460 persons of the labouring class.

A Local Government Board inquiry was conducted on Tuesday at Morecambe by Colonel Durnford into the application by the Urban Council to borrow £25,390 for the extension of the electric light installation, £1,794 for purchasing land for the same, and £918 for the widening of the promenade and sea-wall at the West End beyond the Midland Hotel.

The cottage hospital at Penrith, opened last week by Lady Brougham and Vaux, has been built from designs by Messrs. G. Watson and Sons, of Penrith.

The Whitefield Memorial Church in Tottenham Court-road was opened on the 14th inst. It is stone and red brick. Late Perpendicular in style, the main façade, of red brick and stone, being flanked by dwarf towers. Mr. Rowland Plumbe is the architect of the church, which seats 1,150 worshippers.

WALLS, PARTITIONS, AND FLOORS.

MESSRS. B. WARD AND CO., of Great George-street, Westminster, S.W., have issued a new catalogue of their patented specialities in stable grooved paving, stable drainage, patent fireproof staircases, fireproof ventilated floors and partitions, steel-webbed floors, wood-block and other floors, &c. The catalogue is full of illustrations. Ward's patent grooved and channelled granite concrete stable paving is an excellent floor for stalls and gangways of stables and loose-boxes. The grooves are V-shaped. A 4in. bed of clean, dry broken bricks only is necessary. The grooved granite concrete paving is made with several arrangements of grooves, and in grey, red, or buff, and for gangways of stables and cow-houses, stable yards, &c., is admirable. The material is impervious, and therefore is thoroughly sanitary; for liquid manure cannot permeate it. The list of stables and dairies where it has been used is a sufficient recommendation. The appliances for drainage are simple, and are easily cleansed, and all liquids run direct into an interceptor. Urine traps are avoided by this plan. Messrs. Ward's patent steel-webbed and solid concrete floors are excellent; the girders are wholly incased in the concrete, and coke-breeze fillets are used for fixing the boarded floor. A strong steel webbing is put in the concrete, adding material resistance and saving joists. The incased girders can be moulded below the ceilings, and form a good finish. The patent fireproof floors are soundproof and ventilated; the patent cellular gypsum or concrete slabs protect the lower flanges of beams, and are open as ventilating conduits, and the soffits form a level ceiling. The system is well adapted for hospital and other floors, as the modes of applying are illustrated by sections. The slabs are made in thin thicknesses to suit head-room, and the system is one of the best we have seen. Another section deals with Ward's hollow fireproof partitions, made of hollow blocks or slabs 2ft. by 1ft. wide. These are perforated, stiffened by iron rods. The Ward patent concrete slabs (dovetailed), made hollow, render walls quite damp-proof, and can be fixed with mastic to any brick wall. The artificial stone staircases show circular and rectangular arrangements. The steps are cast in concrete and constructed in the manner of stone *in situ*, and the treads can be grooved and the soffits moulded. The cost is said to be 15 to 20 per cent. less than stone. The patent self-keyed wood-block floors are made in various patterns in deal, Baltic fir, pitch-pine, oak, teak, jarrah, &c., each block 12in. by 2in., slightly keyed together. Among other things, we notice the concrete stonework in the shape of copings, cornices, window dressings, &c., mosaic and marble floors, &c. The catalogue shows in short many economical developments of concrete, steel, and iron, and other materials for building, and should find a place in every architect's and builder's office.

The Kelso District Committee of the Roxburgh County Council have engaged Mr. Harry W. Taylor, A.M.I.C.E., of Newcastle-on-Tyne and London, to prepare a scheme of sewerage and sewage disposal for Morebattle.

By invitation of the president and council of the Royal Society of British Artists, Dr. J. S. Phené, F.S.A., will at 4 p.m. to-morrow (Saturday) lecture on "The Rise, Progress, and Decay of the Art of Painting in Ancient Greece." Visitors to the galleries in Suffolk-street will be invited to remain to the lecture.

The Kensington Vestry have agreed to take up a loan of £25,000, which is the second instalment of a loan of £108,166 from the London County Council, for the electric-lighting works in the parish.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to THE STRAND NEWSPAPER COMPANY, LIMITED.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is ONE SHILLING FOR TWENTY-FOUR WORDS, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

"BUILDING NEWS" DIRECTORY, 1900.

All entries for the above for 1900 *must* reach us by December 1. The charge is £1 per annum prepaid for each entry. Very little space is available for 1900, and no present entries can be continued, or space for fresh ones guaranteed, which are not remitted for by December 1.

It is particularly requested that this notice may be heeded by readers interested. *It will not appear again.* Last year considerable disappointment was experienced by many who omitted to send their instructions in time. The space at the disposal of the "Directory" is strictly limited, and it is impossible to accept entries for the ensuing year after December 1.

RECEIVED.—R. P. C. Co.—E. H. S. and Bro.—J. A.—V. W. C.—J. H. and F.—P. L. and Co.—Estimator.—P. P.—Philip Holmesfield.—The Wrong Way Up.—Tile.—Treasurer.—M.D., G. C. E.

SURPRISED.—Not a bad selection, we think.

SHOP FRONT.—Francis and Co., Gray's Inn-road. The other people have slipped back a bit behind the times, we fancy.

T. T.—The "Moorish Mosaic" you mention is made by G. Woolliscroft and Son, Hanley, Staff.

UNDECIDED.—Tile-hanging would certainly be best. The ordinary "half-timber work" of Mr. Buggins is, to our thinking, detestable.

CASEMENTS.—In bronze and steel as well as iron. Try the Crittall Manufacturing Co., Ltd., Braintree. They turn out remarkably good work at very reasonable figures.

MEASURE AND VALUE.—The point is really hardly worth raising, because it is not a question of general practice. All three can always guard against loss or misunderstanding when making the contract.

Correspondence.

COMMISSIONS TO ARCHITECTS.

To the Editor of the BUILDING NEWS.

SIR,—I have received the inclosed circular, which, I think, needs no comment from me, except that I need hardly tell you that all communications from the firm to me will in future be pitched in the waste-paper basket.—I am, &c.,

21, Havelock-road, Hastings, W. COOPER.
and 2, Claremont-road, Seaford, Nov. 16.

To Mr. W. COOPER, Hastings.

SIR,—We venture to approach you with reference to that department of our manufactures which comes directly in touch with architects and builders.

Being manufacturers on a very extensive scale, and patentees of some very well-known articles, we are naturally in a position to quote favourably. It is our intention to allow architects a handsome commission on all specifications of our productions. These include our patent solid steel case locks and latches, the Vulcan vacuum chimney tops, Vulcan ventilators, and builder's ware generally. An illustrated sheet of the Vulcan chimney we have pleasure in inclosing, and any samples required we shall be only too pleased to submit.

We may add we are in a position to execute all orders promptly, and at the same time give the necessary attention required to insure satisfaction. Your favourable consideration will oblige yours faithfully,

(For S. J. and E. FELLOWS, Limited),
WALTER A. CORKER, Managing Director.
Vulcan Works, Wolverhampton.

CHIPS.

Thirty-two applications have been received for the appointment of engineer to the Birmingham Tame and Rea District Drainage Board, vacant by the death of Mr. Knight. A sub-committee, having considered the whole of the applications, has reduced the number to five.

A bronze memorial tablet to the late Dr. Robert Wallace, M.P., will shortly be placed in Old Greyfriars Church, Edinburgh, of which he was minister from 1868 to 1876, during which year he quitted the clerical profession.

A Local Government Board inquiry was held at the Municipal Offices, Southampton, on Wednesday, by Mr. W. O. E. Meade-King, M.I.C.E., relative to the application of the Southampton Corporation for sanction to borrow £32,000 required for the purchase of lands included in the new scheme confirmed by the Southampton (Housing of Working Classes) Order, 1895, and also £6,822 required for the purposes of water supply.

The Bishop of Llandaff last week dedicated the new organ in St. Catherine's Church, Cardiff. The instrument is a three-manual one, of 46 stops, and has been built by Messrs. Harrison and Harrison, of Durham.

The foundation-stones of a new Wesleyan school-chapel were laid last week at Ushaw Moor, Co. Durham. The sitting accommodation of the building will be for 300 persons. The building is of Gothic design, and built of white pressed bricks, the gift of Messrs. Pease and Partners. The contractor is Mr. Jas. Robson, Waterhouses, and the architect Mr. J. W. Taylor, F.R.I.B.A., Grainger-street, Newcastle-on-Tyne.

The Herts County Museum, in Hatfield-road, St. Alban's, was formally opened by the Countess Cowper on Wednesday week. It is built of red brickwork with red tiles, contains a lecture-room 36ft. by 34ft. on the ground floor, with exhibition gallery above. Mr. A. S. Flower, F.S.A., was the architect. The outlay has been £1,750.

Mr. Herbert H. Law, Local Government Board inspector, held an inquiry, on Friday, at the Withington Urban District Council Offices, into an application of the council to borrow £86,455 for the purposes of sewerage and sewage disposal, and £907 for the purposes of street improvements.

The supply was somewhat short at the London Mart last week, but business was of a satisfactory character, the better class of properties finding ready purchasers. A block of leasehold flats in Marylebone found a buyer for £8,000. The total for the week amounted to £81,375.

A box-making and printing factory, added to the works of Messrs. Page, in St. Stephen's Back-street, Norwich, was opened by a house-warming to the workmen in the employ of the builder, Mr. T. H. Yelfe, Thorpe Station Works, in that city. The architect was Mr. J. Inglis Goldie, A.R.I.B.A.

A London City church is about to be demolished and put up again on the numbered-stone system. This is St. Bartholomew's, Moor-lane, and it has already been once pulled down and rebuilt in this way. Originally it was St. Bartholomew-by-the-Exchange, but rather more than fifty years ago it was removed to make way for the Sun Fire Office. It was carefully re-erected in a new parish in Moor-lane. Now the population has fallen off so considerably that St. Bartholomew, Moor-lane, is to be united with St. Giles, Cripplegate, and the church is to be removed to the suburbs. St. Bartholomew's will then, in less than sixty years, have stood upon three separate sites.

Alterations are being made at Culross Hall, Great Northern Railway, King's Cross Station, and special attention has been given to the ventilation, which will be carried out on the Boyle system.

Intercommunication.

QUESTIONS.

[11370.]—**The Quick and the Dead Fence.**—A has bought a piece of ground, bounded on one side by an old public road, and on another by garden ground, which did not belong to the vendor, both boundaries being fenced with quick hedge. Did not an old law require any person fencing with quick to plant the sets so many feet within his own boundary? Assuming that both hedges belong to A, the question arises, should he, the new owner, wish to replace the existing quick with an iron or wood fence, how much beyond the centre of the hedges could he take in? Was not this question settled by local authority after passing the Enclosure Act?—HAMPSHIRE.

[11371.]—**Stable Paving.**—Which is considered the best paving—blue clinkers, brick, or concrete? Any information will be thankfully received.—TOM.

[11372.]—**Gas-Pipe Channels in Floors.**—How should the gas-piping be laid in a floor of concrete and iron? Is there not some way of providing for the piping by channels? Many of your practical readers will be able to advise.—J. P. T.

REPLIES.

[11363.]—**F.I.A.S.**—I observe in your issue of the 17th inst. two answers to a query which appeared in a former issue. With regard to the first, signed "D. F.," it is only necessary to remark that your correspondent does not even know what the letters mean. With regard to the second reply, marked "A.R.I.B.A.," your correspondent has the advantage of the other one by knowing the full purport of the letters, but in every other respect he is entirely and utterly awry, and one wonders when your correspondent knows the society, as he must do, why he is so awry in his other particulars. Further comment in this direction would appear to be superfluous. It is merely necessary for me to say: (1) That no one but a practising architect or surveyor can become a Fellow or Associate of the society; (2) that no one is admitted as an Associate under £2 2s.; (3) that the society numbers upwards of 300 *practising* architects and surveyors, Fellows, and Associates.—ERNEST McCOLL, secretary, the Institute of Architects and Surveyors, 50, Bedford Row, London, W.C.

[11365.] — **Underpinning.** — The method of measuring is simple, as with brickwork in cement. The underpinning should be kept separate. Include all the shoring and strutting required, and allow extra width—say, 2ft.—for working in excavation. The item should include taking up or cutting off the old footings, also the cube for concrete, and the wedging up with slates in cement. These several items should be separately taken if the underpinning is of any extent, as a special price is necessary, it being done in short lengths. For small quantities the description of items would be sufficient, as including shoring, needling, planking, extra excavation, wedging up with slates, &c.—G. H. G.

[11367.]—**Fireproof Building.**—The two small vols. by T. Potter on Concrete and Uses, of B. T. Batsford, are well worth looking at. Asphalte covers for concrete flat roofs desirable of the best sorts. Perhaps 10s. to 12s. 6d. per super. yard, exclusive of finished surface and ceiling, may be fair estimate of cost for concrete. In wood floors may be 25s. to 32s. per square, &c. See Laxton's, Spon's, or Lockwood's builders' prices.—REGENT'S PARK.

[11367.]—**Fireproof Building.**—Certainly construction in concrete, without any unnecessary timber or woodwork, could be employed for a village hospital. The woodwork fixings could be superseded by coke-breeze concrete or patent blocks; the only woodwork might be confined to the doors, cupboards, &c. A flat roof of concrete covered with a good asphalte, say the Claridge's patent asphalte, would make a good roof; but why flat? No doubt a flat roof is a mistake in this country, and it would be liable to be covered with a thick layer of snow. The construction I should recommend would be concrete with iron or steel webbing; the floors might be of concrete slabs, 3in. or 4in. thick, on iron joists at intervals. The walls would be of solid concrete, and the inner walls stiffened with iron uprights. The cost would be less, as there would be less labour in carpenter and joiners' work, and the concrete would be cheaper than brickwork if the materials were on the site, and the apparatus used simple. In this case, the cost would be probably 15 to 20 per cent. less than brick and timber construction. The inside walls could be covered with one coat of cement or plaster. Your latter query is easily answered. The builder and the architect have a prejudice against cement. It is one of our insular prejudices that take a long time to overcome.—G. H. G.

[11369.]—**Rusting of Water-Pipes.**—Coat with black shiny varnish, or mix cotton-seed or linseed-oil 1lb., coal-tar 1lb., and sulphur 1lb.; heat separately and mix thoroughly, and heat to 300° Fahr. for about one hour, when it becomes pasty. Heat metal when applied.—REGENT'S PARK.

A fire-brigade station is being built in Lower Buckingham-street, North Dublin, by the corporation. The facing materials are red Port Marnock bricks, and the contractors are Messrs. J. Pemberton and Sons, Charlemont-street, Dublin.

A private meeting of the Wolverhampton Board of Guardians was held on Tuesday to consider what steps should be taken owing to Mr. Barlow, of Nottingham, having withdrawn his accepted tender to erect the new workhouse. After some discussion, it was decided to accept the next lowest tender, that of Messrs. Fish and Sons, subject to a clause being inserted in the agreement that nothing should compel the guardians to erect the imbecile block, board-room, &c. It is believed that this will effect a saving of about £17,500.

COMPETITIONS.

Huddersfield.—At the meeting on Monday of the Board of Guardians a report was submitted by the Children's Homes Committee, stating that, after obtaing assistance from the Local Government Board's architect, Mr. P. Gordon Smith, and Mr. H. G. Kennedy, the inspector for the district, they decided to invite the leading architects of the town to send in competitive pencil sketches for two homes, (1) detached, and (2) semi-detached. Fourteen sets of plans were sent in by six Huddersfield firms for consideration, under mottoes, and strictly anonymous. The committee unanimously decided that, in their opinion, the scheme marked "Block A" was the best of those sent in, and they desired the author of that scheme to prepare plans for submission to the Board. These plans had now been supplied, and the estimate of cost considered, and the committee unanimously recommended that the plans, prepared by Mr. J. W. Cocking for two homes at Outlane, at an estimated cost of £1,847, be adopted and forwarded to the Local Government Board for approval. After some discussion the report was adopted by the Board.

Linslade.—In the open competition for schemes of water supply and sewerage for the district of Linslade, Buckinghamshire, the schemes submitted by Messrs. Sands and Walker, civil engineers, Nottingham, have been selected and unanimously adopted by the council, and application is to be at once made to the Local Government Board for sanction to the necessary loans for carrying out the works.

CHIPS.

The partnership heretofore subsisting between S. Horton and H. M. Brown, of Wednesbury, architects and surveyors, under the style of Horton and Brown, has been dissolved.

The Dean and Chapter of Canterbury have just received from a lady, whose name is not made public, a costly gift, consisting of an exact copy of the robes worn by Thomas à Becket now deposited at the Cathedral of Sens. They are of scarlet, and interwoven with gold and silver, and decorated with pearls and other precious stones. They comprise cope, chasuble, stole, &c., and make a very magnificent and interesting collection.

The Sketch Club, composed of members of the thirteen art schools in London, held an interesting gathering at South Kensington Museum on Saturday night. The schools are accustomed to compete annually for an award of honour given for sketches on stated subjects. "Music," "Summer Heat," and "Watching," were suggested for this year's productions, of which some hundreds figured on the walls. The judges, Messrs. Frampton, A.R A., S. J. Solomon, A.R.A., and David Murray, A.R A., decided in favour of the South Kensington School, whilst warmly commending Lambeth.

The second annual exhibition of the Arts and Crafts Society of Ireland was opened on Monday in the Royal University Buildings, Dublin, by the Earl of Mayo.

The Education Department has approved of the local examinations held by the examinations board of the National Union of Teachers as qualifying successful candidates to sit for the diploma of sanitary inspector. Holders of the diploma, the examinations for which are under the supervision of the sanitary inspectors' examination board, are eligible for appointment as sanitary inspectors under e Public Health Act, London, 1891.

A new organ, built by Messrs. Abbott and Smith, Leeds, at a cost of £400, was dedicated in the Priory Church, Old Malton, on Friday, by the Dean of York.

Winksley Church, near Ripon, after being closed five weeks for repairs and redecoration, has been reopened for Divine service. New leaded lights have been inserted, and the church redecorated throughout, the work having been carried out by Messrs. Broadbank and Son, of Harrogate.

Messrs. Head and Wrightson, of Thornaby-on-Tees, have received an order for the supply of a large quantity of bridge work to the South African Field Force to renew or repair the structures destroyed by the Boers. The stipulation is that the bridges have to be shipped by the end of the year, and the firm obtained the order in consequence of their having undertaken to deliver the bridges in a shorter time than any other competitor. The firm are engaged on a similar order for the Natal Government.

Colonel A. C. Smith, R.E., held an inquiry at Colwyn Bay on the 16th inst., on behalf of the Local Government Board touching an application by the urban district council to borrow £5,120 for purposes of electric lighting and £550 for street mprovements.

LEGAL INTELLIGENCE.

Laying Out Streets without Sanction.—Armstrong v. London County Council.—This case, heard in the Queen's Bench Division on Friday before the Lord Chief Justice, Mr. Justice Bigham, and Mr. Justice Darling, was stated by justices of London upon convicting the appellant on an information laid by the respondents charging him with commencing to form and lay out a street for carriage traffic without first having obtained the sanction of the council contrary to section 7 of the London Building Act, 1854. The appellant is the owner of a piece of land called the Cleveland Estate, containing upwards of three acres, adjoining the Grove, in the parish of St. Pancras. The land is bounded on one side by the Grove, a public carriage-way, and on the opposite side by Parliament Hill, a public park. On the remaining sides it is bounded by land owned privately. In July, 1898, the appellant commenced to build on the land in accordance with plans deposited with the district surveyor. He proposed to pull down some old buildings and erect 20 new buildings or blocks of flats, each block containing eight flats, of which 16 blocks were to be erected in the form of a quadrangle with an ornamental garden in the centre. The approach to the quadrangle was to be by means of a carriage-way from the Grove running round the garden, and bounded as to the part between the Grove and the garden by two more of the blocks on either side. Each block would have a separate entrance to the carriage-way, the approach from the Grove would be 40ft. in width, and the total length of it would be 600ft. The carriage-way was formed and sewered in all respects in the way in which the carriage-way of an ordinary street would be formed and sewered. The appellant did not intend to dedicate any right-of-way for the use of the public over the land; but he intended to erect gates at the entrance, and to keep a porter there, and the carriage-way was intended for the use only of the tenants of the flats and persons visiting them with or without carriages. Prior to the commencement of the buildings an application was made to the Council for their sanction. The plans did not show any gates at the junction with the Grove, but showed a through communication with a footway upon Parliament Hill. The sanction of the Council was refused on the ground that the proposed street would not afford direct communication between two streets formed and laid out for carriage traffic. The justices convicted the appellant, and ordered him to pay a fine of 20s. and five guineas costs. Section 7 of the London Building Act, 1894, provides that "before any person commences to form or lay out any street, whether intended to be used for carriage traffic or for foot traffic only," such persons shall make an application, accompanied by plans, to the Council for their sanction to the formation or laying out of such street. Section 9 provides that the Council may refuse such application where the proposed street "will not afford direct communication between two streets, such two streets being (where it is intended to form or lay out such street for carriage traffic) streets formed and laid out for carriage traffic." Mr. Macmorran, Q C., for the appellant, contended that the conviction was wrong. The carriage-way was not a street within the meaning of section 7, nor was it laid out for carriage traffic. It might be a street for certain purposes, but it was not a street within the section, because it was not intended for public carriage traffic. Public traffic was what was contemplated by the section, not private traffic. A carriage-way to a private house was obviously not intended to be touched by the section. It could make no difference when, as here, there were several private houses, the carriage-way being intended for their use only. This view was contrary to "Daw v. L.C.C.," but it was consistent with "Metropolitan Board of Works v. Nathan" and "Wood v. L C.C." (the Artillery Mansions case). He also cited "Reg. v. Fulford" and "L.C.C. v. Davis." Mr. Avory, for the respondents, said that there was evidence that this carriage-way was a street, and, that being so, the magistrates' finding was conclusive ("Maude v. Baildon"). The fact that the carriage-way was not open to the public, but closed by a gate, did not prevent its being a street. It might be a street, though closed to the public (see "Vestry of St. Mary, Islington, v. Barrett"). The section included a street laid out for any sort of carriage traffic, public or private, assuming that the carriage-way was a street in other respects. The arguments being concluded, the Court reserved its judgment.

Damages Recovered from Builders for Withdrawing a Tender.—Croshaw v. Pritchard and Renwick.—In the Queen's Bench Division, on Monday, Mr. Justice Bigham tried this action to recover damages for breach of contract. The plaintiff was the owner of certain freehold premises in Bermondsey, and the defendants were builders. In August of the present year the plaintiff was desirous of having certain building work done on his premises, and on August 22 the following letter was written by the plaintiff's architects to the defendants:—"Our client, Mr. Croshaw, of No. 116, Fenchurch-street, the freeholder of premises in the occupation of Messrs. Roberts, Adlard, and Co., as above, is about to make additions to the property, and we should be glad to know whether you would be willing to give us a tender in competition for the work. No quantities will be supplied, and our client does not bind himself to accept the lowest or any tender." Subsequently the specification was sent to the defendants, and on September 14 the defendants wrote to the plaintiff the following letter, which was headed "Estimate":—"Our estimate to carry out the sundry alterations to the above premises according to the drawings and specification amounts to the sum of £1,230." On the next day the plaintiff wrote that he accepted the defendants' "offer to execute for the sum of £1,230" the work in question. At a later date the defendants wrote that they had made an error in their figures, and that under the circumstances they must withdraw their estimate. The plaintiff had the work done by another builder at a price higher than that given by the defendants, and he now brought this action to recover the difference in price as damages for breach of contract. The question was whether there was a complete contract binding on the defendants. Their contention was that their letter of September 14 was not a binding tender; that the word "estimate" was advisedly used by them in order to avoid a final and binding agreement, which would have resulted from the use of words such as "we offer to execute the work." Evidence was given by several builders to show that this distinction is always observed in the trade. The cases of "Lewis v. Brass" and "Harvey v. Facey" (1893) were referred to. Mr. Justice Bigham said that the plaintiff's letter of August 22 was an invitation to the defendants to send in a tender in competition for the work. That meant that they were to state the price at which they would do the work, and the specification was sent in order that they might have the necessary materials upon which to tender. Then, on Sept. 14, the defendants sent the letter headed "Estimate," and the question was whether that letter was an offer to do the work at the price mentioned. His Lordship was clearly of opinion that it was. It had been suggested that there was some custom or well-known understanding that a letter in this form was not to be treated as an offer. There was no such custom, and, if there was, it was contrary to law. Both plaintiff and defendants, in his Lordship's opinion, intended these letters to constitute a complete contract. It was said that there was no complete contract, because in the specification there was a blank left as to the time within which the work was to be completed. In the ordinary course a subsequent agreement would be come to as to the time; but if there was no subsequent agreement, then the work would have to be done in a reasonable time. But the absence of any such subsequent agreement would not have the effect of setting aside the already existing contract. The question for decision did not, in fact, depend upon any supposed custom of the trade, but on the language of the letters which had passed between the two parties. The defendants had made a mistake, and they must abide by the consequences of it. There would be judgment for the plaintiff for £250, with costs.

Quis Custodiet Custodes?—At Worship-street Police-court, on Monday, Mr. Henry Ward, civil engineer, of 110, Cannon-street, City, a member of the London County Council, and ex-chairman of the Works Committee, was summoned for contravening the Metropolis Local Management Act by erecting a building in Slater-street, Bethnal Green, without having given notice. The defendant did not appear, and Mr. Margetts, for the Bethnal Green Vestry, said it was impossible that the defendant should not know that it was an infraction of the law to do what he had done—digging out the foundations and erecting a building in the place named—when, as a Chairman of the Works Committee of the London County Council, he made the by-laws which regulated such matters. Evidence was given by Chief Sanitary-Inspector Foot as to discovering the building in course of erection, the roof being then on; and Mr. Barrett, surveyor, proved that no notice of the work had been given. A foreman who came forward said he was responsible. Mr. Corser said defendant was responsible, and did not attend. He was, therefore, fined 40s. and two guineas costs.

Workman's Compensation Act.—A New Point.—At Southwark County-court, on Monday, his Honour Judge Addison, Q C., gave judgment in an important case under the Workmen's Compensation Act on a point which has never before been raised. The applicant was a painter named Pearse, and the respondents were the London and South-Western Railway Company. In May applicant was employed with other men putting the finishing touches to Hampton Court Railway Station, which had been reconstructed by Messrs. Perry and Co., his employers. He was knocked down by an engine, and his right foot was cut off. His Honour came to the conclusion that the work on which the applicant was engaged at the time of the accident "was merely auxiliary and incidental to, and was no part of, or process in, the trade or business carried on" by a railway company, which was merely the carriage of passengers and goods. Consequently, he was obliged to find against the applicant; but, as a matter of law, he would give him every facility to enable him to appeal. Mr. Acland, who represented the respondents, said this was the first case out of over 1,000 under the Act which the company had contested, but they felt bound to get a decision on this point, which was raised for the first time, because it was so far-reaching.

SEQUEL TO SPECULATIVE BUILDING AT FAZACKERLEY.—At the Ormskirk County-court, on Tuesday, before his Honour Judge Collier, Peter Balmer, quarry owner, Aughton, sought to recover £14 from E. Watson Eldridge, architect, Liverpool; W. Thomas, Melling; and H. Parker Edge, Fazackerley, builders, for stone supplied for the erection of certain villas at Fazackerley, in which the plaintiff alleged the parties had a joint interest. Mr. R. R. Glover appeared for the plaintiff. After the case for the plaintiff had been given, the defendant Eldridge said he acknowledged sole liability for the debt, while Mr. Tetlow submitted that there was no case to answer in respect of his client, Mr. Thomas. His Honour held the same opinion, and said that on the evidence he could not find that anyone besides Eldridge was liable. As to means, the latter said he had lost close upon £1,000 in this building speculation at Fazackerley, and he was now worth nothing; he had neither house nor furniture, and he had closed his office in Dale-street. He hoped to get a situation in an architect's office. His Honour gave judgment against Eldridge for the full amount, payment at £2 a month, and allowed Thomas's costs.

THE WAKEFIELD ARBITRATIONS.—The Wakefield City Council have been informed that the award in the arbitration between the Corporation and Lawton's Trustees had been received. The property in question, which is required for street improvements, included the six shops in Market-place and Cross-square, occupied by Messrs. Job and Carr, Gill, Lake, Matterson, Wallis, and Wharton, and the claim amounted to £9,900, and the Corporation's valuation was between £5,000 and £6,000. The award is for £8,016 16s., and the Corporation also has the costs to pay. There are still two other awards be made.

IN RE T. H. CUCKSON, OF SHEFFIELD.—The public examination of Thomas Herbert Cuckson, builder and contractor, 44, Bradley-street, Sheffield, took place on the 17th inst. at Sheffield. The liabilities are £3.235 13s. 10d., and assets estimated at £694. Debtor said he commenced business nine years ago with about £60 capital. He went into partnership with his brother, J. E. Cuckson, and about five years since he made an arrangement with his creditors, paying 6s. 8d. in the pound. His liabilities at that time were about £1,500, and his father undertook to find the money. He had been carrying on since that time with the assistance of his father, and he now owed him something like £1,300. His father had no security for this money. The Official Receiver: As a matter of fact, in consequence of this liability your father has had to file his petition?—Yes. The Official Receiver adjourned the examination to the 7th December.

HOUSE AGENTS' COMMISSION. — An important point to landlords and tenants was decided at the Lambeth County-court on Friday. Messrs. Cane and Co., estate agents, Peckham Rye, sued Newman Maurice, a theatre manager, to recover £2 commission for letting a house. The defendant contended that, as the agreement was 5 per cent. on the rental, no money was due, as no rent had been paid. The tenant had run away. Plaintiffs argued that the commission was due, as the person they recommended was accepted as a tenant. Judge Emden described the point as an important and a novel one. It was the first time the point had been raised before him. Plaintiffs said they had previously let the same house, but made no claim, as the tenant had turned out unsatisfactorily. Judge Emden held that there was a certain responsibility resting upon agents to recommend reasonable tenants. The fact that the two successive persons recommended by the plaintiffs proved unsatisfactory was against their claim. He would non-suit Messrs. Cane, and hoped the decision would render agents more careful in recommending persons as tenants.

AN UNDISCHARGED BANKRUPT AND HIS CREDITORS.—At Birmingham, on Tuesday, James Henry Akerman, of 21, Wilson-street, off Finsbury-square, London, was charged under the Bankruptcy Acts with obtaining credit for several large amounts from Birmingham firms without disclosing the fact that he was an undischarged bankrupt. Mr. Frayling, solicitor to the Public Prosecutor, appeared in support of the charge, which was that defendant obtained credit to the extent of £300 on September 6, 1898, from Messrs. B. Whitehouse and Sons; for £60 7s. 6d. on October 5, from the Griffin Foundry Company; and £24 on October 11, from George Brindley, without informing them he was an undischarged bankrupt. Mr. Frayling said Akerman's petition was filed on July 14, 1898. In May, 1898, the defendant rented a house at 7, Vicarage-road, Edgbaston, and on July 7 he went to Mr. Ernest Wigley, architect, Colmore-row, Birmingham, and got an estimate for repairs to the property. Messrs. Whitehouse obtained the contract for the repairs, amounting to £310, on September 6, 1898, after defendant had been adjudicated a bankrupt. On September 14 defendant, Messrs. Whitehouse, and Mr. Ernest Wigley went to the Griffin Iron Foundry, in Stephenson-street, and chose £60 worth of grates, stoves, and chimneypieces. Credit in each case was obtained. John Benjamin Whitehouse, a member of the firm of B. Whitehouse and Sons, builders and contractors, 110, Monument-road, stated that it was not until December 17 that defendant informed him that he was a bankrupt, and even then he did not say that he was undischarged. Defendant was committed for trial to the Quarter Sessions, bail being allowed in the sum of £25, and two sureties of £50. It was stated by a detective-sergeant that Akerman had only a week since completed a sentence of four months' imprisonment for fraud in London.

CHIPS.

Mr. Kitchen, son of the Dean of Durham, has just been appointed chief architect to the Local Government Board, in the place of Mr. Percival Gordon Smith, F.R.I.B.A., who has resigned after a service of 40 years in the Government offices.

At Wigan, on Friday, Mr. E. P. Burd, Local Government Board inspector, held an inquiry into an application for sanction to the borrowing of £17,000 for the extension of the gasworks undertaking, and also for sanction to the borrowing of £2,200 for the provision of a bowling-green, recreation-grounds, and the culverting of the brook in Mesnes Park. There was no opposition to the proposals.

The Hants County Council have resolved to purchase Park Prewett Farm, in the parish of Sherborne St. John, as a site for the erection of a new lunatic asylum, at the price of £9,000. They have decided to appoint Mr. George T. Hine, F.R.I.B.A., of Westminster, as architect for the building, and have instructed him to prepare preliminary plans and estimates.

A large new church clock has just been erected at Dittisham, Devonshire, which strikes the hours and shows time upon one large dial. It is fitted with all the latest improvements, and generally to the designs of Lord Grimthorpe. Messrs. John Smith and Sons, Midland Clock Works, Derby, carried out the work, and they are also restoring the clock of the neighbouring church of Coombe Raleigh.

The death is announced of Mr. Peter Inglis, clerk of works on the Buccleuch Estate at Dalkeith. Mr. Inglis, who was a native of Bonnyrigg, had been about twenty-three years in the employment of the Duke of Buccleuch.

The Pauncefort-Duncombe Memorial Concert-Hall and Reading-Rooms at Great Brickhill were formally opened by Lord Cottesloe last week. The concert-hall is 48ft. by 20ft., and is seated for 180 persons; and the reading-room is placed on the opposite side of entrance. Residences are provided for a village nurse and for the caretaker. Mr. Thomas Yirrell, of Bletchley and Leighton Buzzard, was the builder.

The Swansea Board of Guardians have decided to extend the workhouse, at an estimated cost of £12,000.

A thanksgiving service for the restoration of the parish church was held at Turkdean, Northleach, last week, to mark the completion (so far as it is likely to be carried at present) of the work. The first portion, which was done in 1897, consisted of a large amount of underpinning of walls, and rebuilding in two or three places, together with new roofs throughout. The second stage has been done this year—namely, the reflooring of nave and chancel with wood blocks (coloured tiles being laid within the altar rails), a fresh arrangement of the seats, and other improvements. The architect who has carried out the restoration is Mr. C. Ll. R. Tudor.

The Camberwell Palace of Varieties on Denmark Hill was opened on Monday. The building will accommodate an audience of no fewer 3,000 people, seating accommodation being provided for 2,400. The ground floor has been so divided as to permit the arrangement of three distinct sets of seats—orchestra stalls, pit stalls, and pit. The grand circle is on the first tier, and on the second tier are the gallery seats. The proscenium opening has a width of 21ft., the depth being 34ft. The decorations of the interior are of Moorish design. The balconies are erected on the cantilever principle, thus rendering the erection of pillars unnecessary. Mr. Woodrow is the architect. The outlay has been £26,000.

Our Office Table.

IN view of the issues of certain brickmaking companies which have been offered since the publication of our article on p. 576, we repeat our caution to investors and consumers to be very careful. In one prospectus, at any rate, promised returns are based on prices that are simply delusive. We wish it were not so! There is not only slackness coming in the brick trade, but there is sure soon to be a recurrence of strikes. Even present prices will not bear present wages, and we shall be quite contented to be thought false prophets if the coming year does not inaugurate a period of labour disputes in the brick trade which will prove very embarrassing to some brickmaking companies. Meanwhile, our advice is, to all concerned, to have nothing to do just now with the starting of new brickworks or the floating of brickmaking companies where the figures will not bear the strictest investigation, and where the certain drop in prices that is coming is not taken fully into account.

AT the meeting, on Tuesday, of the London County Council, Mr. Shaw Lefevre, Chairman of the Improvements Committee, said that the committee were going to consider at their next meeting whether they should not at once start pulling down some of the houses on the south side of Holywell-street, for the improvement of the Strand, as their valuer had recommended. The committee were anxious that the widening of the Strand should be proceeded with as rapidly as possible, for there was no doubt a great public desire that no further delay should take place in this improvement. On the recommendation of the Highways Committee, it was agreed to seek powers in the London County Tramways Bill, to be promoted in Parliament next session, for the reconstruction for electrical traction of the portions of the Council's tramways between Westminster Bridge-road and Tooting, and between Blackfriars Bridge and the tramways junction near the Horns public-house at Kennington. The estimated cost of the reconstruction of these lines is about £251,000. Mr. Waterlow, Chairman of the Housing Committee, replying to questions, said they had done nothing towards obtaining powers for the purchase of land outside the county for rehousing purposes.

THE London County Council proposes to make an experiment in the housing of working-men on the lines of Lord Rosebery's scheme for drafting population out of London. The land which has been bought lies on the further side of Tooting Common, within a few hundred yards of the ground of the Tooting Bec Golf Club, from which, however, it is separated by a belt of wood and pasture. A start is to be made with 1,200 houses, to be let, probably, at 4s. or 5s. a week. The ground has been bought for £1,400 an acre—a comparatively low price for the district.

THE last of the series of lectures on sanitary building construction arranged under the auspices of the Carpenters' Company was delivered on Thursday in last week at the hall, London-wall, by Mr. James Bartlett, a member of the council of the Society of Architects, and the demonstrator at King's College. The subject was "Setting-out Work and By-laws," and Mr. Bartlett gave a comprehensive interpretation of what was meant by the phrase "drawing to scale." By way of illustration, he exhibited a number of old surveys of the City of London dated 1557, and compared them with modern plans. The former included the Tower of London, old London Bridge, and several of the ancient city churches. In the old surveys, he explained, the houses were shown in isometrical elevation, as against the well-known block-plan of the Ordnance Survey of the present day. The one, while interesting and artistic from the antiquarian point of view, was of no real use for reference and measurement as compared with the present Ordnance Survey. One of the most interesting features about these mediæval drawings consisted of the various signs employed and set forth with architectural minuteness. These made them at once quaintly picturesque. In the course of the lecture Mr. Bartlett imparted much valuable information of a purely technical nature as to the colouring of work, and the setting out of plans preparatory to actual building operations.

A SPECIAL committee of the Aberdeen Town Council met the local architects and builders in the Town House in that city the other day, in response to their request that they should confer together respecting the clauses in the Corporation Bill affecting the construction of buildings generally. Dean of Guild Walker presided. Mr. R. G. Wilson, architect, represented the Architects' Association, and Mr. John Morgan, builder, appeared on behalf of the Builders' Association. The conference considered the various clauses in which the interests of the building trades were concerned, and discussed propositions for amending details. It was arranged at the end of the proceedings that the architects and builders should submit their views in writing on the subject within a week, indicating the alterations they considered should be made in the Bill. This representation will be discussed by the Town Council Committee, and the opinions of the builders given effect to if possible. At the close thanks were offered the town council for the manner in which they had received the deputation of architects and builders. In reply, Dean of Guild Walker remarked that they were grateful for the assistance of practical men in these matters, and said the whole object of the town council was to make the Bill as perfect as they possibly could.

The Master of the Worshipful Company of Clothworkers of the City of London, Mr. A. C. Cronin, has recently presented to the Textile Museum of the Yorkshire College two interesting specimens of Japanese textile craftsmanship. The fabrics are 2ft. 3in. long by 2ft. wide, and are illustrative of the qualities of design, colour, and artistic treatment peculiar to the Japanese. The perspective drawing, as well as the rich and delicate foliage of the trees, are excellently done. Like many examples of Eastern work, the operations of the loom have been combined with those of the artists' brush in the attainment of the natural representation of the subject. From a technical standpoint, one of the most interesting features of these choice fabrics is the development of the trees in fine velvets, which, when coloured, give the soft, dense qualities which are observed in the foliage of Scotch firs. The ground of the texture is loop pile, what is technically called "terry," whilst all figured parts are cut or velvet pile. These two effects form exactly that kind of contrast which appropriately accentuates the foliage and other decorative parts. The loop pile also forms a surface on which the shading and colouring may be effectively brought out.

Under the presidency of Sir George Birdwood, Mr. D. E Hutchins, Conservator of Forests at Cape Town, read a paper on National Forestry before the Society of Arts on Wednesday evening. Mr. Hutchins urged that the need for a general reforesting of England and Wales was essential if the British Isles were to be restored to their former beauty and productiveness. A quarter of a century spent in the administration of National forestry estates in India and the Colonies enabled him to say with confidence that the great want of England was, at the end of the nineteenth century, national forestry. He strongly advocated the establishment of a State system. The amount of wood imported into this country for the purposes of the country showed an expenditure of eighteen millions sterling, which was in proper conditions producible in Britain itself. Apart from the loss involved in sending so much money abroad there was the fact that the re-establishment of the forest industry would arrest the decline of the rural populations. The advantages of a comprehensive system of forestry would also give employment to capital now languishing with Consols at 2 per cent.; it would arrest the fall in the value of land in Great Britain caused by the substitution of a new fuel, and would tend to the abatement of the smoke nuisance in towns. When he studied in the forest schools of Europe a quarter of a century ago natural forestry in England was not a paying concern. To-day the country could borrow at 2 per cent., and the million a year which, he urged, should be spent—out of public money—on forests would return a profit to the State of at least 3 per cent. Sir J. Fayrer and Dr. Schlick joined in the discussion, and both urged the adoption of a system of natural forestry at home as a means of averting the timber famine which was within measurable distance at the present moment.

The wall-paper combination, which includes some of the most important manufacturers of the country, has practically settled with its customers the terms which are to govern its new arrangements, and it is evident that prices will generally rule much higher than those now existing. Manufacturers' clearance stocks, which were largely bought by Jewish dealers, and retailed at prices often less than one-third of the original market value, are no longer to be sold in this manner, and it is intended to keep a tight hand on the sale of the foreign-made papers of France and Japan.

The civil engineers are busy at Chicago designing a steel-framed palace for the Crown Prince of Japan that is warranted to resist earthquakes. A message was received in that city some time ago from Japan, asking whether it was possible to construct a building of sufficient strength and immobility to resist earthquake shocks. Several Chicago engineers drew up plans that would cost 3,000,000dol. to follow out, and these were submitted and were accepted. Work has been begun on the structure, and it will be shipped to Tokio in sections, to be erected there. The palace will be practically constructed entirely of steel like a huge box, so that it cannot fall unless there should be a convulsion of sufficient force to turn it over on one side bodily. When it became known in Japan that the Crown Prince had ordered the earthquake-proof palace several other contracts were given out for similar structures, all of which will be designed and shipped from Chicago.

MEETINGS FOR THE ENSUING WEEK.

Monday.—Surveyor's Institution. "Party Walls Under the London Building Act, 1894," by P. E. Pilditch, F.S.I. 8 p.m.
Society of Arts. "Art Enamelling upon Metals," Cantor Lecture No. 2, by H. Hardinge Cunynghame. 8 p.m.

Tuesday.—Institution of Civil Engineers. Discussion on "The Waterloo and City Railway and its Electrical Equipment." 8 p.m.

Wednesday.—Society of Arts. "The Great Seals of England," by Allan Wyon. 8 p.m.

Friday.—Architectural Association.—Discussion Section.

CHIPS.

The Breton landscape painter, Van Dargent, died in Paris on Wednesday, aged 75 years.

The Improvements Committee of the London County Council decided at their meeting on Wednesday, on the motion of Mr. Howell Williams, to recommend the council to allot a site on the new street from Holborn to the Strand to the Gladstone Memorial Committee for the erection of the National statue to Mr. Gladstone.

The Local Government Board has given formal consent to the borrowing by the Willesden District Council of £50,000 for the purchase of the Dollis Hill Estate, which it is proposed to convert into a public park. The Middlesex and London County Councils, the Hampstead Vestry, and the Hendon District Council are contributing £17,500 of the purchase-money, leaving Willesden a net sum of £32,500 to raise.

A stained-glass window has just been placed in St. Edmund's Church, Marske, Richmond, by way of memorial to the late Rev. T. W. Robson, M.A., who was rector of the parish for 23 years. The work is from the studio of Messrs. Powell Brothers, of Park-square, Leeds. Stained glass has also been inserted by the same firm into one of the aisle windows of the church of St. Helen and Holy Cross, Sheriff Hutton, Yorks, to the memory of the late Mrs. Jane Pearson.

A receiving order has been made in the case of Osborne and Franks, of Witherington-road, Highbury, N., builders.

An inquiry was held in the Guildhall, Ludlow, on Friday, before Colonel Marsh, Local Government Board inspector, into an application by the town council for permission to borrow £8,500 for the purposes of sewerage and sewage disposal, from plans by Messrs. Pollard and Taylor, C.E.'s, London.

The Upton-on-Severn Rural District Council having applied to the Local Government Board for power to borrow £2,550 for sewerage works at Pole Elm and Callow Elm, Powick, an inquiry was held on Friday by Colonel Marsh, one of the inspectors of the Board. A previous application to the Board had been refused on account of the unsuitability of the site of the outfall. A new site had been obtained, which Lord Beauchamp had consented to lease for twenty-one years. The inspector pointed out that unless a longer lease could be obtained the loan would have to be repaid within that time. The council are under obligation to abate a nuisance arising from the discharge of the drainage of the convent into a ditch within twelve months, and the temporary measures adopted are costing £80 per annum. The present scheme had been prepared, and was placed before the inspector by Mr. Marten, C.E., of Birmingham.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	„	9 0 0
Wrought-Iron Girder Plates	8 15 0	„	9 15 0
Bar Iron, good Staffs	8 7 6	„	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	„	17 5 0
Do., Welsh	5 15 0	„	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	„	8 5 0
Best Snedshill	10 0 0	„	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£14 10 0	...	£15 0 0
Best ditto	15 0 0	...	15 5 0

	Per ton.		Per ton.
Cast-Iron Columns	£9 0 0	to	£9 15 0
Cast-Iron Stanchions	9 0 0	„	9 15 0
Rolled-Iron Fencing Wire	8 5 0	„	9 5 0
Rolled-Steel Fencing Wire	8 5 0	„	9 5 0
„ „ „ Galvanised.	12 0 0	„	13 0 0
Cast-Iron Sash Weights	5 17 6	„	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	„	11 0 0
Cut Floor Brads	9 15 0	„	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18/3	per cwt.

Cast-Iron Socket Pipes—			
3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	„	7 0 0
7in. to 24in. (all sizes)	6 15 0	„	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	62½ p.c.
Water-Tubes	57½ „
Steam-Tubes	56½ „
Galvanised Gas-Tubes	50 „
Galvanised Water-Tubes	45 „
Galvanised Steam-Tubes	40 „

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£33 0 0	to	£34 0 0
Do., Vieille Montagne	34 10 0	„	35 15 0
Sheet Lead, 3lb. per sq. ft. super.	18 10 0	„	18 12 6
Pig Lead, in 1cwt. pigs	17 0 0	„	17 10 0
Lead Shot, in 28lb. bags	20 10 0	„	21 10 0
Copper Sheets, sheathing and rods	95 15 0	„	96 0 0
Copper, British Cake and Ingot	79 10 0	„	80 10 0
Tin, Straits	128 0 0	„	129 0 0
Do., English Ingots	133 0 0	„	134 0 0
Spelter, Silesian	20 12 6	„	20 15 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
„ Bangkok	„ ...	11 10 0	„	15 10 0
Quebec Pine, yellow	„ ...	5 5 0	„	7 0 0
„ Oak	„ ...	4 10 0	„	6 10 0
„ Birch	„ ...	2 15 0	„	4 15 0
„ Elm	„ ...	5 0 0	„	5 10 0
„ Ash	„ ...	4 5 0	„	5 0 0
Dantsic and Memel Oak	„ ...	2 10 0	„	4 10 0
Fir	„ ...	3 0 0	„	4 0 0
Wainscot, Riga p. log	„ ...	3 10 0	„	5 15 0
Lath, Dantsic, p.f.	„ ...	4 10 0	„	5 10 0
St. Petersburg	„ ...	4 0 0	„	6 10 0
Greenheart	„ ...	7 15 0	„	8 0 0
Box	„ ...	7 0 0	„	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	„	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	„	0 0 7½
„ Honduras	„ ...	0 0 4½	„	0 0 6
„ Mexican	„ ...	0 0 3½	„	0 0 4
„ African	„ ...	0 0 3½	„	0 0 5
Cedar, Cuba	„ ...	0 0 4	„	0 0 4½
„ Honduras	„ ...	0 0 3½	„	0 0 3½
Satinwood	„ ...	0 0 10	„	0 1 9
Walnut, Italian	„ ...	0 0 8	„	0 0 7½
„ American	„ ...	0 2 3	„	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£20 0 0	to	£27 0 0
„ 2nd	15 0 0	„	17 10 0
„ 3rd	9 0 0	„	11 0 0
Canada Spruce, 1st	9 0 0	„	11 10 0
„ 2nd and 3rd	7 10 0	„	9 0 0
New Brunswick	7 0 0	„	8 10 0
Riga	9 0 0	„	10 0 0
St. Petersburg	10 10 0	„	17 0 0
Swedish	10 10 0	„	17 10 0
Finland	9 10 0	„	11 0 0
White Sea	12 5 0	„	18 5 0
Battens, all sorts	5 0 0	„	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 10 0	„	£0 15 0
2nd ditto	0 9 0	„	0 11 0
Other qualities	0 4 6	„	0 9 6
Staves, per standard M :—			
U.S. ditto	£35 0 0	„	£42 10 0
Memel, cr. pipe	210 0 0	„	220 0 0
Memel, brack	180 0 0	„	190 0 0

OILS.

Linseed	per tun	£22 5 0	to	£22 10 0
Rapeseed, English pale	„ ...	23 15 0	„	24 0 0
Do., brown	„ ...	22 5 0	„	22 10 0
Cottonseed, refined	„ ...	17 15 0	„	18 15 0
Olive, Spanish	„ ...	33 10 0	„	34 10 0
Seal, pale	„ ...	20 0 0	„	21 0 0
Cocoanut, Cochin	„ ...	29 10 0	„	29 15 0
Do., Ceylon	„ ...	25 0 0	„	25 5 0
Palm, Lagos	„ ...	25 10 0	„	23 10 0
Oleine	„ ...	18 15 0	„	19 15 0
Lubricating U.S.	per gal.	0 6 8	„	0 7 6
Petroleum, refined	„ ...	0 0 6½	„	0 0 6½
Tar, Stockholm	per barrel	1 6 6	„	1 6 6
Do., Archangel	„ ...	0 19 0	„	1 0 0
Turpentine, American	per tun	32 10 0	„	33 0 0

LIST OF COMPETITIONS OPEN.

Rye Harbour—Sewerage Scheme (population 375)	£25 (merged), £10	Theodore J. Smith, Clerk, Flushing House, Rye	Nov. 25
St. Agnes—Water Scheme for Supplying Wheal Rose, Skinner's Bottom, and Blackwater from Mevagissey Watering	£25 (merged)	John Angwin, Clerk. St. Agnes, Cornwall	,, 30
Nassau, Bahamas—Public Market	£40, £10, £5	The Civil Engineer, Nassau, Bahamas, via New York	,, 30
Bury, Lancs—Infectious Diseases Hospital, Bolton-road (limit £12,500; Assessor)	£100, £50, £25	The Borough Engineer, Corporation Offices, Bank-street, Bury	Dec. 1
Ilford—Church (limit £4,000)	£20, £15, £10	J. Lamb, 20, Belmont-road, Ilford, Essex	,, 12
Lymm—Council Offices, Whitbarrow-lane (£2,800)	£25 (merged). £15	W. Mullard, Clerk, Council Offices, Lymm	,, 15
Dunoon—East Bay Improvement	£100, £50, £25	J. Valrose Clery, Town Clerk, Dunoon	Jan. 31
Belfast—Assembly Hall and Central Offices	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast	Mar. 12

LIST OF TENDERS OPEN.

BUILDINGS.

Barry—Additions to Intermediate School	Glamorgan County Council	T. Mansel Franklen, Clerk, Westgate-street, Cardiff	Nov. 25
Lostwithiel—Two Villas		J. Green, Lostwithiel	,, 25
Great Houghton—Store and Two Houses	Barnsley British Co-op. Society	A. B. Linford, Architect, Carlton Villa, Wombwell	,, 25
Swindon—Stables, &c., Lethbridge-road		W. H. Read, M.S.A., Corn Exchange, Swindon	,, 25
Bodmin—Additions to Infants' School	School Board	William J. Jenkins, M.S.I., Bodmin	,, 25
Grangemouth—Hall, Kerse-road		G. Deas Page, Architect, Old Glebe Chambers, Falkirk	,, 25
Plymouth—Destructor Buildings, Prince Rock	Corporation	James Paton, Borough Engineer, Plymouth	,, 25
Batley—Two Houses, Clerk Green-street		P. Spencer and Son, Architects, Batley Carr	,, 25
Cardiff—Repairs to Chimneys at Workhouse	Guardians	Arthur J. Harris, Clerk, Queen's Chambers, Cardiff	,, 25
Elgin—Villas		Charles C. Doig, Architect, Elgin	,, 25
Leeds—Heating-House, &c., East End Park	Corporation	The City Engineer's Office, Municipal Buildings, Leeds	,, 25
Blackburn—Gasworks Buildings, Greenbank	Gas Committee	Samuel R. Ogden, Eng., Municipal Offices, Victoria-st., Blackburn	,, 25
Whitehaven—Witnesses' Room at Police Station		George Dale Oliver, F.R.I.B.A., County Architect, Carlisle	,, 25
Edinburgh—Additions to North Canongate School	School Board	Robert Wilson, Architect, 3, Queen-street, Edinburgh	,, 25
York—Screen and Partition, Museum-street	Guardians	Penty and Penty, Architects, Lendal Chambers, York	,, 25
Bryn—Church		Frank B. Smith, Architect, Port Talbot	,, 25
Felixstowe—Stripping and Retiling Roof of Town Hall	Felixstowe and Walton U.D.C.	Geo. S. Horton, Surveyor, Town Hall, Felixstowe	,, 27
Broughton Moor—Public Hall and Twenty Cottages	Flimby Colliery Co.	Donald and Tate, Architects, 14, John-street, Workington	,, 27
Cirencester—Science and Art Classrooms		Waller and Son, Architects, 17, College-green, Gloucester	,, 27
East Ham—Caretaker's Residence at Plashet-lane Schools	School Board	R. L. Curtis, Architect, 120, London Wall, Moorgate-street, E.C.	,, 27
Otley—Seventeen Houses, Jennett's-crescent	Leeds Industrial Co-op. Society	Fairbank and Wall, Architects, 3, Manor-square, Otley	,, 27
Ilkley—Alterations at Royal Hotel		T. C. Hope and Son. Architects, 23, Bank-street. Bradford	,, 27
Stranorlar—Alterations at Workhouse Infirmary	Guardians	E. Toye, Architect, Victoria Chambers, Strand, Londonderry	,, 27
Aberdare—Rebuilding Eagle Inn, Commercial-street	A. S. Pleace	T. Roderick, Architect, Clifton-street, Aberdare	,, 27
Elland—Fourteen-Chambered Brick Kiln	D. Sharratt and Sons	Sharp and Waller, Architects, 32, Bradford-road, Brighouse	,, 27
Brynmawr—Synagogue		Isaac Isaacs, Pawnbroker, Bailey-street, Brynmawr, Wales	,, 28
Hornsey, N.—Repairs at Board Schools	School Board	Stanley Hodson, Clerk, Board's Office, Highgate, N.	,, 28
Blackpool—Electricity Works and Workshops	Corporation	Robert C. Quin, M.I.E.E., M.I.Mech.E., Blackpool	,, 28
Cupar—Villa and Eight Houses, West End	Mrs. Williamson	Wm. Birrell, Architect, Crossgate, Cupar	,, 28
Heytesbury—National Schools		W. H. Hardick, Architect, High-street, Warminster	,, 28
Brighton—Alterations, &c., School Board Offices	Brighton and Preston School Board	T. Simpson and Son, Surveyors, 16, Ship-street, Brighton	,, 28
Ardee—Repairs to Labourers' Cottages	Rural District Council	Louis Turley, C.E., 17, Laurence-street, Drogheda	,, 28
Gateshead—Additions to Higher Grade School, Durham-road	School Board	Oliver, Leeson, and Wood, Architects, Mosley-street, Newcastle	,, 29
Pontefract—Two Villas, Beechwood-avenue		William Hurst, Architect, Pontefract	,, 29
Lanchester—Laundry at Workhouse	Guardians	G. T. Wilson, Durham-road, Blackhill, Co. Durham	,, 29
Cardiff—St. Stephen's Church, West Bute-street		E. M. Bruce-Vaughan, F.R.I.B.A., Cardiff	,, 29
Kidderminster—Abutments, &c., for Two Bridges, Castle-road.	Town Council	Arthur Comber, Borough Engineer, Town Hall, Kidderminster	,, 29
Carleton—School		Swire Hartley, Poulton-road, Carleton	,, 30
Eastbourne—Laboratory at Rear of Town Hall	Lighting Committee	Wm. Chapman Field, Borough Architect, Town Hall, Eastbourne	,, 30
Baildon—Lodge		S. Jackson and Son, Architects, Tanfield Chambers, Bradford	,, 30
Rotherham—Turkish and Slipper-Baths	Corporation	J. Platts, Architect, Rotherham	,, 30
Penzance—Dry for China Clay		Robert Godfrey, C.E., Penzance	,, 30
Halifax—Public Hall	Pellon Ward Liberal Club	J. F. Walsh & G. Nicholas, Archts, L. & Y. Bank Chmbers, Halifax	,, 30
Rothes—South Wing, &c., at Station Hotel		Sutherland and Jamieson, 51, High-street, Elgin	,, 30
Gedney—Grove-end School	School Board	R. H. Holmes Hand, Architect, Spalding	,, 30
Braunton—House		Ellis, Son, and Bowden, Surveyors, Bedford Chambers, Exeter	,, 30
Barry—Small-pox Hospital	Urban District Council	J. C. Pardoe, A.M.I.C.E., Surveyor, Holton-road, Barry, Glam.	,, 30
Wakefield—Additions to Cathedral Church		Claude Leatham, Wakefield	Dec. 1
Chard—Stoves, Greenhouses, Pits, &c., Snowdon Hill House	A. D. Paul	Arthur W. Yeomans, M.S.A., Architect, Chard, Somerset	,, 1
Egremont—Alterations to Four Houses		James Kinney, Little Mill Farm, Egremont	,, 1
Alresford—Vagrant Wards and Laundry at Workhouse	Guardians	W. H. Hunt, Architect, Alresford	,, 1
Idle—Fourteen-Chamber Continuous Brick Kiln	Blake Hill Quarry Co.	W. J. Beall, Surveyor, 23, Bank-street, Bradford	,, 1
Leeds—Factory, Hudson-road		Percy Robinson, Architect, 72, Albion-street, Leeds	,, 1
Maryport—Mineral Water Manufactory	Brewery Co., Ltd.	C. Eaglesfield, Architect, Maryport	,, 1
Keighley—Warehouse, &c.	W. Summerscales and Sons, Ltd.	W. and J. B. Bailey, Architects, 1, Scott-street, Keighley	,, 1
Otterbourne—Workmen's Cottages, Malms Estate		Colson, Farrow, and Nisbet, Architects, 45, Jewry-st., Manchester	,, 1
Peebles—School at Kingslands	School Board	R. Wilson, Architect, 3, Queen-street, Edinburgh	,, 2
Canterbury—Cricket Pavilion	Kent County Cricket Club	W. J. Jennings, Architect, 4, St. Margaret-street, Canterbury	,, 2
Bossington—Two Cottages	W. H. Deverell	Thomas Stopher, Architect, 57, High-street, Winchester	,, 2
Woolston—Infants' School, Ludlow-road	School Board	Mitchell, Son, & Gutteridge, Archts., 9, Portland-st., Southampton	,, 2
Preston—Cottages (118) on Swansea Estate, Water-lane		Garlick and Sykes, 32, Winckley-square, Preston	,, 2
Ebbw Vale—Alterations and Extension of Cottage Hospital	Workmen's Doctor's Fund Com.	Landsdowne & Griggs, Archts., Met. Bank Chmbrs, Newport, Mon.	,, 2
Swindon—Hospital Buildings	Swindon & District Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	,, 2
Lynton—National Schoolroom	Building Committee	Arnold Thorne, 16, Cross-street, Barnstaple	,, 2
Bexley Heath—Infants' School, &c.	School Board	John Ladds, Archt., 7, Doughty-st., Mecklenburgh-square, W.C.	,, 4
Whitechapel, E.—Electricity Supply Station, Osborn-street	District Board of Works	M. W. Jameson, Engineer, 15, Great Alie-street, Whitechapel, E.	,, 4
Exmouth—Two Villas, Salterton-road		Ernest E. Ellis, Architect, Exmouth	,, 4
Ilford—Retort-House Roof, &c.	Gas Company	John Denny, Secretary, Gas Company, Ilford	,, 4
Horsham—School, Victory-road	School Board	William Buck, Architect, North-street, Horsham	,, 4
West Hartlepool—Stables, &c.	Corporation	H. T. Neilson, West Hartlepool	,, 4
Norwich—Additions to Hospital, Bowthorpe-road		A. E. Collins, M.I.C.E., City Engineer, Guildhall, Norwich	,, 5
Cowes—Police Station	Isle of Wight County Council	Francis Newman, County Surveyor, St. Thomas's-street, Ryde	,, 5
Fleetwood—Public Shelter	Urban District Council	E. Frobisher, A.M.I.C.E., Surveyor's Office, Town Hall, Fleetwood	,, 5
Bekesbourne—Additions to Sanatorium	Bridge Rural District Council	W. J. Jennings, Architect, 4, St. Margaret's-street, Canterbury	,, 6
Cardiff—New Operating-Room at Infirmary		Edwin Seward, F.R.I.B.A., Architect, Cardiff	,, 6
Sheffield—Stables, &c., Charlotte-street	Highways Committee	Charles F. Wike, C.E., City Surveyor, Town Hall, Sheffield	,, 6
Keswick—Two Villas, Chesnut-hill	G. P. Abraham	Thos. Hodgin, 27, Station-road, Keswick	,, 7
Carrickfergus—Schools and Hall	Select Vestry of St. Nicholas	Samuel B. Close, Architect, Donegall-square Buildings, Belfast	,, 7
Settle—Alterations to Town Hall Buildings		Henry Ross, Architect, Cannon-street, Accrington	,, 11
Wavertree—Cottage Home School (400), Olive Mount	Liverpool Select Vestry	Edmund Kirby, Architect, 5, Cook-street, Liverpool	,, 11
Lochgelly—Block of Twenty Two-Storey Tenements	Co-operative Society	John Murray, Architect, 233, High-street, Kirkcaldy	,, 11
Sligo—Works and Repairs at County Infirmary		W. T. Vernon, Secretary, Courthouse, Sligo	,, 12
South Kensington—Foundations, &c., Victoria & Albert Museum	H.M. Commissioners of Works	Sir John Taylor, K.C.B., H.M. Office of Works, Storey's Gate, S.W.	,, 15
South Kensington—Foundations, &c., Royal College of Science.	H.M. Commissioners of Works	Sir John Taylor, K.C.B., H.M. Office of Works, Storey's Gate, S.W.	,, 15
Shirebrook—Lock-Up	Standing Joint Committee	J. Somes Story, County Surveyor, St. Mary's-gate, Derby	,, 16
Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Langham and Osborne, Architects, 70, High-street, Ramsgate	,, 18
Fleetwood—Board Schools (730)	School Board	Walter H. Haworth, Architect, 15, Mawdsley-street, Bolton	,, 18
Birkenhead—Wing to Science and Art School	Corporation	C. Brownridge, A.M.I.C.E., Boro' Engineer, Town Hall, Birkenhead	,, 19
Swindon—Additional Hospital Buildings	Swindon and Dis. Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	Jan. 6
Belfast—Villa at Helen's Bay		J. W. Whiteford, C.E., 28, Waring-street, Belfast	—
Armley—Houses and Shop, Hall-lane	Craven and Gilby	J. M. Fawcett and Son, Architects, Basinghall-street, Leeds	—
Keighley—Working-Men's Club		Geo. H. Knowles, Architect, Burlington Chambers, Keighley	—
Caerwys—Manager's House	Denbighshire Portland Cement Co.	The Company's Offices, 66, Watergate-street, Chester	—
Hirst—Shop, &c.		J. Walton Taylor, F.R.I.B.A., Newcastle-on-Tyne	—
Blackwell—Forty Coke Ovens and Chimney	Colliery Co.	The Secretary, Blackwell Colliery Co., near Alfreton	—
Leeds—Thirteen Houses, Ivy House Estate, York-road		W. S. Braithwaite, Architect, 6, South Parade, Leeds	—
Hull—Turning Mill, Dansom-lane	R. Canty	T. Brownlow Thompson, Architect, 15, Parliament-street, Hull	—
Ashton-under-Lyne—Pair of Semi-detached Villas		Thomas D. Lindley, Architect, Market-avenue, Ashton-under-Lyne	—
Colchester—Hotel	Charrington, Nicholl, and Co.	J. W. Start, F.S.I., Architect, Colchester	—
Scunthorpe—Wesleyan Sunday Schools		John M. Dossor, A.R.I.B.A., Architect, 2, Manor-street, Hull	—
Treborth, near Bangor—House	H. C. Vincent	Richard Hall, Architect, Bangor	—
Bradford—Shops and Warehouses, Sunbridge-road		Empsall and Clarkson, Architects, 7, Exchange, Bradford	—

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BLATANT BUILDINGS.

ARCHITECTURAL practice is just now fraught with much that is mischievous. Under the title of "professional" a great deal is done that is distinctly pandering to the tastes, prejudices, and commercial spirit of the day. We hear occasionally of illicit dealings with tradesmen who have accepted commissions for orders, and other prevaricating and shuffling tactics between members of the profession and those engaged in large contracts; but there are other perhaps less shabby proceedings which have grown and multiplied in this age of competition that are certainly *infra dig.*, and are worth notice. There is the temptation to make a building a huge advertisement for the architect—to do pettifogging things, some of them rather trivial and paltry, which can only create amusement, or perhaps contempt, in the eyes of the public. They may no doubt be considered by many as mere devices of competition which every tradesman and professional man adopts; but they are harmful, inasmuch as they arouse a feeling of resentment amongst those who have to pay. We do not say the young practitioner, when he wins his first competition, is not perfectly justified in making the best of it, by taking advantage of opportunities that are thrown in his way; but when he endeavours to create opportunities and to go out of his way to turn them into account or profit, then he is rather exceeding the bounds of discretion and playing down to a low level. Amongst the many ways by which architectural practice can be made to play rather low there are some more serious than amusing. We shall deal chiefly with the more serious cases. Competition furnishes us with many instances of architects taking advantage of the ignorance or prejudices of a committee to obtain the popular bid. Fine and smart perspectives, exaggerated scale, profuseness or obtrusive ornament which the author knows cannot possibly be executed for the sum allowed, are methods that have been resorted to to win competition unfairly to others who have scrupulously carried out the instructions. These tactics are still resorted to wherever a free hand is given. The extravagances of competition are no doubt fewer than formerly. The framing of instructions with the assistance of an assessor leaves little room for tricks of drawing, yet there are still opportunities open to the competitor. He can put all his display on one front, while treating his other elevations in the plainest and most naked manner; introduce a tower or a dome which cannot be built for the money to be expended, as we saw in some of the designs for the Plumstead Municipal Buildings; give larger areas to some of his departments by reducing the area for light, favour a powerful official by placing his offices in a conspicuous position. More reprehensible are underestimating the scheme, submitting tenders from a builder quite inadequate to carry out the building, or disclosing the author's plans to certain members of the committee. But there are other more permanent forms of blandishment in buildings.

The architect is not always satisfied with those quiet unostentatious modes of working which his great predecessors followed. There is a strong love of obtrusiveness. If the building is in a street, a great display must be made in the front. Upon it are lavished stone carving, exuberant details, no matter how starved in appearance the flank elevation may be, or how the interior has to suffer. There is a flippant, commercial spirit in all this. Not one in a hundred will see the interior, and therefore the design must be attractive externally. If we compare this with the old method of working, what do we find? Quiet and unostentatious work by designer and craftsmen. The building is more thorough, every effort has been staked on a good plan and interior, the architect works from within outwards, instead of only caring for the exterior, and leaving the interior to work out as it may. Often the old building is plain to a fault outside, as in most of the buildings of sixty years ago. Whether of brick or stone, the old street house or mansion was well built, the stone was in deep beds, well bonded and cramped, the backing of brick was solid, the carpenter and joiner's work was by no means scamped, as we may see for ourselves. The trades were not, as now, separated by an impassable gulf. The carpenter framed massively; the joiner actually executed the work, not merely fixed it; the plastering was often artistic. We cannot pretend to say that the average modern buildings in our streets are equal to them in these respects: they are rather painfully flimsy and weak; everything looks thin and superficial, as if there was no structural backbone behind. The tendency of the "shop" is everywhere present. The stone-carver must exhibit his pretensions and existence — his name is blazoned on a board fixed to the scaffolding; those who supply the electric lighting fittings, who carry out the lifts or the decorations follow suit. It is announced that the electric lighting is done by Messrs. Arc and Co., the decorations by Messrs. Flash and Crimp. There is a blatant manner in all this which the public takes cognisance of. The whole building looks like an advertisement for certain firms. Can we imagine the old builders and crafts doing anything so blatant as to announce severally, "I am the sculptor and carver," "I design the decorations," "We supply all the gas and electric-light fittings," "We ventilate," &c.? But we live in a different age, and these things are done by individuals and firms who have expended large capitals in their businesses, and have become experts, and if they did not keep their names before the public they would be lost sight of altogether. The architect, of course, has no voice in the matter; these several branches of the work are usually sublet to firms. They all do their best to insure success, the architect's scheme is carried out as nearly as it can be, and under his control, though, unhappily, he is obliged to accede to a great many requests which are inconsistent with each other, or to allow each firm to do the best they can. We cannot wonder if there is competition between these several firms, if each wants to make the greatest impression, and the whole concert is therefore out of tune. The architect, of course, gets the credit or blame of the performance for not exercising control, the public are indifferent; money has been spent, and an impression made.

The modern interior exhibits with equal distinctness the motives of the designer. His own work in the shape of details of joinery, plaster-work, &c., is wanting in fitness, aim, and coherency; there is a moulding on a skirting that is repeated higher up in a pilaster capital, showing that it is machine-made and "planted" in substitution for a specially-designed moulding; the same is seen on the top of a mahogany screen as a capping; the panel mouldings are repeated *ad nauseam*, and so on. But the architect prides himself upon having exhibited in his interior a number of "new" things in the shape of so-called "improved" or "artistic" lock furniture, a new process of veneering or a carved wood imitation, or perhaps an improved ceiling and wall decoration—some of these atrocious in design or positively *outré*. This exhibition of a number of distinct trades is a distinguishing mark of modern work, and often becomes mere advertising. The modern hotel, or the new *suite* of offices, or the shop, betrays how little sympathy there is in such design with all that is genuine and sincere in architecture. Smith and Jones, the commercial decorators, are as obtrusive as the manufacturers of iron and brass work and "art furniture." All is "per specification" or quantities, instead of design based on material and actuated by motives.

Extravagant and blatant detail is one of the characteristic features of buildings of the class we are considering. The commercial block, the modern hotel, and even our public offices have caught the spirit. The extravagant elevation is obtrusive by inviting invidious comparison with plainer building; it defies that sense of good taste and feeling, which we value in moderation in personal dress. The over-elaborate façade asserts and obtrudes itself in defiance of the principles of harmony, and precisely as it exceeds the limits of discreet adornment it becomes blatant and defiant. The superfluous carved front is one of the modes of this extravagance. Carving becomes offensive when it exceeds the limits imposed by the conditions of the building. Can we imagine anything more offensive or trumpery than to see a quantity of carving on a small suburban dwelling, or in the front of a public house in a third-rate or smoky locality? What we can admire in the façade of a civic building, hotel, or theatre is downright offensive and ludicrous in a small vestry hall or shop. Akin to this extravagance is the over-laboured front, with its ornate detail, pilasters, entablature, balustrade, terminals, pediment, and richly-adorned window. The good sense and moderation of the Classic Revivalist early in this century ought to teach us something. Now the most ignorant of Classic details indulges in the most fulsome display of all the ornament and adjuncts of the style; even the small, insignificant frontage is crowded with details till the smallness of their scale renders them positively ridiculous. These are a few of the blandishments and excesses met with in modern buildings, largely created by the eager rush for notoriety. We have not exhausted the many ways by which professional art often manifests itself—all due to the same spirit of making the building an advertisement, even at the sacrifice of good taste, adaptation, and moderation. They are many, and not flattering to those who pursue this policy of practising their art. No doubt it is favourable to what we may term easy methods of business. Those who follow it have a desire to save trouble, as when they use the stock patterns of the trade in such things as mouldings and fittings generally. There is also an amusing aspect of such business. One instance has been immortalised by Dickens in his character of "Pecksniff" in "Martin Chuzzlewit"—the display of fictitious drawings; and the speculative follower of the profession often finds other not very dignified ways of promoting his business.

OVERLAPPING IN BUILDING LEGISLATION.

THE difficulties experienced by architects in passing their plans, especially in London, owing to the overlapping of the jurisdiction of several authorities, are well known by all who have been engaged in building operations, and the president of the Society of Architects, Mr. Walter Emden, J.P., was justified in the remarks he made on the subject in his opening address the other night. Between the London County Council various by-laws, regulations, and the requirements of the vestries, there has been considerable complication and friction, and this condition will continue till the Legislature turn their attention to the matter, or the profession through their constituted societies press the subject before the authorities. The London Government Bill offered an excellent opportunity for improving the rules as to building by simplifying and codifying the several Acts of Parliament which affect building operations in the Metropolis. The new Act is more constructive than ameliorative; it has succeeded in dividing London into boroughs, but it has not done anything to simplify the administration of the law with regard to building. The codification of the Acts relating to local government is one of the first things that ought to be undertaken. At present we have numerous by-laws under different Acts of Parliament. These Acts were framed, one after the other, chiefly to amend and supplement previous Acts, and, in course of time, they have become numerous and complicated. The London Building Act, 1894, has superseded, wholly or in part, thirteen Acts of Parliament which affect buildings and structures in the County of London. It has vastly simplified the machinery of the old legislation, which was complicated or ambiguous. It also has amended several Acts; but the local authorities, the vestries, and district boards and local boards still retain their powers, which are often in conflict with the powers of the central authority. To take, for example, a few instances of the powers of local authorities. Builders have to give notice to them before pulling down or rebuilding; under the General Powers Act, 1890, and the Metropolis Management Act, 1855, they have power to license hoardings. With regard to drains and water supply, the vestries or district boards have equal power. Every building owner has to give notice as to the construction of any drain he may desire to make, and it has to be done to the satisfaction of the local authority. No drain can be connected with local sewers without their sanction; closets are to be constructed under the Public Health (London) Act, and the local authority can enforce any regulations, and no new house can be inhabited without their certificate. The local authority also deal with streets, with the frontage lines of buildings and projections; but, with all the safeguards, it has been found impossible to obtain uniformity of regulation or administration as to these and other matters like projections of buildings. Many things are under the control of the Council, others are not; and so we have repeated conflicts going on between these authorities and the Council. Can we expect anything like uniformity under a divided authority? Even the present London Building Act is a consolidation of the old laws, and if we compare the new with the old provisions, or those repealed, we can see at once what a complex affair the Act is, and how loopholes for escape are likely to arise. One way of simplifying the law relating to local government is to codify the Acts concerned. The London Government Act has reduced the number of conflicting authorities by placing several old vestries under one control; but beyond this it has not gone. There still remains the overlapping of one municipality with another, and the consequent labour for owners and architects who intend to build or make alterations. This labour often entails several—always two or more—sets of plans, &c., for the same building. As we have held, the local authority should have the control of all that has to do with the sanitary condition of buildings in the locality. Drains, water supply, foundations, the lines of frontage and projections, are matters which immediately concern the local authority, and they should also have powers to direct the construction of buildings—in one word, their duties should be strictly administrative and executive; while in the framing of by-laws those points of general significance, or about which questions may arise, should be in the hands of the central authority, who ought, of course, to have a general superintending authority and regulate all questions concerning the main drainage, Metropolitan improvements, dwellings for the labouring classes, the rules affecting construction and fire resistance, all sanitary questions affecting the community as a whole that are of general, and not local, import. In one word, the local authority should be vested with the administration of the law, the central authority with constructive legislation and all that concern the Metropolis as a whole. It may, perhaps, be said that any line of demarcation between the duties of the boroughs and the Council would be impossible; but there need not be any difficulty if the local acts and by-laws are amended and brought into line with each other. For this end simplification of the Acts and their codification are certainly required. Architects have a personal interest in this question, and the Society of Architects would do useful service in undertaking to promote the necessary action to bring the subject before the authorities and the Legislature, as Mr. Emden suggested the other evening. A good deal of the present vexatious overlapping of legislation is owing to the number of provisions under one head which the architect and building owner has to meet. If they were all framed on a reasonable basis depending upon the requirements of each locality, it would not be so bad; but the by-laws in operation in many of the vestries vary from one another. Look, for example, at the different provisions and regulations regarding foundations, drainage, building lines, and sanitary fittings, or, at any rate, the meanings attached to them. One locality will insist with strictness on a certain depth of concrete or line of frontage, another will be less exacting, or two adjoining parishes have different by-laws. These divergences point to the repeal or simplification of a number of provisions under certain heads by which unification would be secured, so that rules of common and general application may be observed, and those of minor importance repealed or left to the necessities of each case.

* * *

ESTIMATES.—XXXII.

MISCELLANEOUS IRONWORK, STABLE FITTINGS, AND PLUMBING.

THE pricing of plumbers' work requires a knowledge of lead used for different purposes, and the allowance to be made for laps, rolls, and drips. Lead is described according to the weight per superficial foot in pounds, and it is necessary to know the equivalent thickness of each weight. Thus: 4lb. of lead is ·068in., 5lb. of lead ·085in., 6lb. ·101in., 7lb. ·118in., 8lb. ·135in., &c. The weights per lineal yard of lead pipes required by the water companies are also necessary. The Metropolis Water Act requires for ⅜in. pipe 5lb., ½in. 6lb., for ⅝in. 7½lb., for ¾in. 9lb., 1in. 12lb., per lineal yard. The current price of English common brands is £16 to £17 per ton, and the price of English sheet lead, 6lb. per foot square, and upwards, is £18 per ton. Milled lead cut to dimensions is priced at 18s. 6d. per cwt., including labour, if laid on flats and gutters £1 2s. 6d. per cwt. A sheet of lead is 7ft., or usually 6ft. 10in. wide to from 25ft. to 30ft. in length. Flashings are usually 5in. or 6in. wide, and allowance is made for tacks and passings; 4in. for every 7ft. length, and 6in. for every angle; this allowance covers the weight of tacks. Davis's or Buchan's treatise on plumbing will give the student all information about laying lead, &c.

There are no reliable data on which to base constants for valuing plumber's work.

Lead-headed nails, wall-hooks, tacks, &c., are charged per piece, clout nails by the hundred, copper nails by the pound weight.

The flashings of gutters, &c., will include galvanised iron holdfasts or wall-hooks. These are placed at intervals to secure the turned-in edges of flashing, which go into the joints of brickwork. Then the lower edge of flashings over slate roofs are secured by lead tingles nailed to roof boarding. The width of lead required for side flashings would be from 12in. to 15in. Sometimes the lower edge of lead is dressed over a fillet of wood forming a side gutter, and the slates are laid over. The upturned edge is overhung by an apron flashing. The following weights are recommended:—

Roofs, flats, and main gutters	7lb. lead.
Hips, ridges, and small gutters	6lb. ,,
Flashings	5lb. ,,
Cisterns and sinks, bottom	7lb. ,,
,, ,, sides	6lb. ,,
Soil pipes	8lb. ,,

The joints of lead in ridges, hips, flashings should have a 4in. lap, and in roofs and valleys about 5in.; allow 9in. or 10in. for each roll in addition to length measured on flat.

MISCELLANEOUS IRONWORK.

No. 4. Cast-iron brackets as per design (see sketch 1), 20in. long and 10½in. deep, about 5lb. each, and fixing to brickwork.

These are probably for window balconies, and would cost about 10s. 6d. each. If made to a special design, add pattern, say—

	£	s.	d.
Cost of iron and casting	0	4	6
Pattern, say, 20s. per bracket	0	5	0
Fixing to brickwork, brick and cement	0	1	6
	0	11	0

Provide and fix cast-iron verandah accord-to design with No. 4 open cast-iron pilasters, brackets, cresting, railing, and gutter complete, 21ft. long, 4ft. wide.

This is a rather indefinite description. If a stock design is selected, the price may be roughly put at from 12s. to 15s. per foot run, exclusive of roof and fixing. The parts may be priced separately at, say—

	£	s.	d.
Four cast-iron pilasters, each	0	15	0
Six ornamental brackets, each	0	5	3
Railing, say, per foot	0	4	3
Casting to gutter per foot	0	1	3
Gutter, per foot	0	2	9

The above figures work out at about 13s. per foot run.

The most satisfactory plan is to obtain an estimate for verandah and fixing from a large firm like Young and Marten of Stratford.

Provide and fix four balcony panels, as per design (sketch 2), and fixing 40in. wide and 31in. high.

This pattern will cost about 4s. 6d. per foot, or 15s. each panel. Labour fixing, add, say, 2s.

No. 2. Strong cast-iron brackets, 20in. projection, let into brick wall.

Say—

	£	s.	d.
Price of bracket	0	6	6
Cutting brickwork, cement, &c.	0	1	6
Each	0	8	0

No. 1. Wrought-iron grille, hinged to entrance (see sketch 3), size 5ft. wide and 4ft. 6in. high.

A grille of this design would cost about £5 5s. (see Young and Marten's Catalogue.)

No. 3. Stable sashes, 2ft. 10in. by 3ft. wide, with flat heads 1½in. thick.

The price for sashes of this size is given at 32s. 6d.

No. 4. Cast-iron finials to hips of roofs. See W. Macfarlane and Co.'s Illustrated Catalogue for prices.

50ft run. Iron cresting to ridge to design (see Macfarlane and Co.'s price list).

STANDARDS AND BENCHES.

No. 40. Bench and back iron standards, 31in. high back, 15in. high in seat, 18in. base, to design.

These may be priced at 4s. 6d. each.

Ditto. Bench and desk standards, 22½in. high, bench 15in. high.

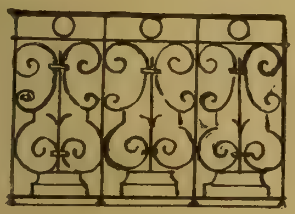
These have supports for both desk and bench, and are worth about 5s. 3d. each.

120ft. run. School seat, desk, and table combined. Seat 16in. high and 8in. broad; desk 14in. broad; table 29½in. high, complete in pitch-pine.

The price for these arrangements vary—say, 9s. to 10s. per foot.

1

2



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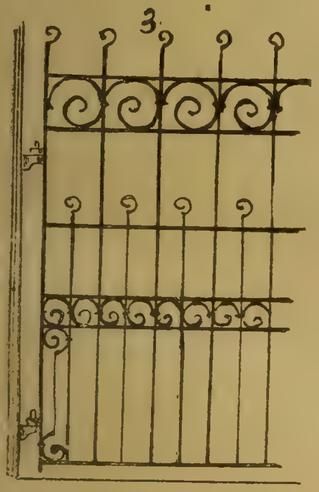


Provide and fix in school No. 10 convertible desks and seats, 7ft. 6in. long, of pitch-pine, with cast-iron standards, two to each seat, with desk 13¾in. wide, seat 9in., shelf 7in., and 28in. high, according to pattern.

We can only approximately affix a price. There are several convertible seats in the market, in which the desk can be made flat to use as a table, or a back; the seat also turns up. We may price each desk and seat at about 28s. 6d. Dual desks and seats, 3ft. 4in. long, cost about 20s. each.

(Messrs. Young and Marten supply reversible school seats, 5ft. long at 18s. and 8ft. long at 21s. each, made in pitch-pine.)

LIFTS.

Provide and fix a dinner-lift, 2ft. 1in. by 1ft. 6in., to travel 22ft.

The weight of a lift of this description would be about 60lb. The price in London would be about £1 per foot, or £22 fixed.

A double dinner-lift would cost about £25 10s.

Add to this, trimming floors, inclosing by walls or framing, &c., say, another 3s. per foot.

Obtain estimates from such firms as Messrs. R. Waygood and Co., Archd. Smith and Stevens, Battersea.

Provide and fix a hydraulic warehouse-lift, "high" pressure, height of travel 50ft., for 10cwt., &c., complete.

The price quoted in A. Smith and Stevens's list is £175, fixed in London, including boring, but exclusive of trimming floors, inclosures, &c.

A hydraulic dinner-lift, 3ft. 3in. by 2ft. 5in., size of well-hole, to lift 56lb., with total height of lift of 16ft., with deal box, would cost about £38.

	£	s.	d.
Cost of hydraulic lift	38	0	0
Fixing in London, say	10	0	0
Excavating, &c., say	2	10	0
Trimming floors and inclosing, deal, say	6	0	0
	£56	10	0

This is only an approximate estimate (see list).

STABLE FITTINGS.

No. 4. Stall-posts 4in. diameter, with halter-ring, 9ft. 6in. ramp, and iron fittings complete.

If the pattern of stall-post is plain, the price will be about £1 2s., say—

	£	s.	d.
Stall post, &c., each	1	2	0
Stall ramp, 9ft. 6in. long	0	10	0
Sill ditto, ditto	0	8	3
Fitting post to ramp	0	6	0
	2	6	3
10 per cent. profit	0	4	8
	2	10	11

Obtain estimates from the St. Pancras Iron Co., or Hayward Bros. and Eckstein, Ltd.

Providing and fixing complete four-stall divisions with 4½in. diam. stall-posts, ramps 9ft. 6in. long, to pattern; sill ditto, and fitting stall-posts to ramps for 1¾in. wood partitions.

Taking items of each:—

	£	s.	d.
Stall post, 4½in. diam.	1	5	0
Ramp, 9ft. 6in., say	0	12	6
Sill, ditto	0	10	6
Fitting stall post to ramp	0	6	0
	2	13	0
Add 10 per cent. profit	0	5	4
	2	18	4

For 1½in. board the price would be rather less.

No. 3. Cottam's stall divisions 9ft. long, stall-post 5ft. 2in. to head, 4in. diam. for 1½in. wood, cast-ramp, and sill rails complete.

The price depends chiefly on size and make of stall-post and the base. The "self-fixing" base for heel-posts is made to spread under the concrete, and is perforated, as shown in sketches 4 and 5.

No. 4. Self-fixing bases for heel-posts fixed in concrete, with bolts (see sketch 5):—

	£	s.	d.
Cost of iron base	1	0	9
Labour and concrete, say	0	5	0
Each	1	5	9

No. 2. Stall divisions 9ft. long, post 4½in. in diameter, increased to 5¼in. at bottom, with ball top, iron ring, ramped rail and sill with movable wedge, to take 1¾in. wood boarding.

If the ramp and ironwork are plain, and the wood fitted to ramp and sill, the cost would be about £2 15s. per division.

Do. with wrought-iron ventilating ramp with sheath guard-bar, do., &c, for 2in. wood:—

	£	s.	d.
The cost would be about	6	8	6
Add for 2in. wood	0	3	6
	6	12	0

Ditto if 9ft. 10in. long, 4½in. cast-iron heel-post with ring, wrought-iron ventilating ramp with sheath guard-bar and wall-plate, sill, &c., for 2in. wood.

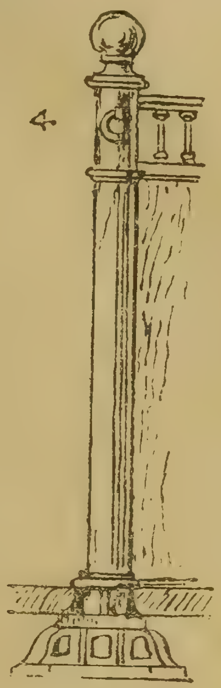
This is priced in list at £7 1s.

Provide and fix No. 5 manger sets, manger, hayrack, gruel-pot, &c., complete, 6ft. long, painted.

These may be priced at about 42s.; galvanised at 69s. per set. Obtain list of the St. Pancras Iron Works Co., Pancras-road.

No. 2 corner sets ditto, 4ft. 2in. square.

If painted, say 45s. to 50s. a set; galvanised, 72s.



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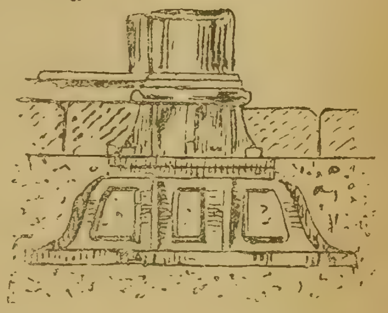


Provide and fix No. 3 extra heavy and finished "Cottam's" manger fittings for stalls 6ft. wide, with barrel-fronted top plate, manger-pot 22in. long, 13in. broad, and 9in. deep, tip-up gruel-pot 13in. square, with waste-chamber and pipe, wrought-iron hayrack 26in. long, 19in. broad, 32in. high, with cast moulded coping manger-plate, with seed-saving chamber below, fitted with brass bushings with tying apparatus.

The price given in Hayward Brothers' and Eckstein's stable fittings list is £4 6s. 9d. plain painted, and if galvanised £6 18s. 9d.

Ditto, ditto, Cottam's registered stable fittings, with barrel front, oval manger with inside lips, top-plate, rack, and manger, &c.

These are priced at from £2 10s. to £3. If galvanised, add 17s.

PLUMBER: EXTERNAL PLUMBING.

21cwt. 19qr. Milled lead and labour in flats, gutters, flashings, hips, &c.

The price of sheet-lead is now quoted at from 16s. to 18s. per cwt. Add for labour and solder about 5s. to 6s. per cwt., although it can be let for as low as 4s.

	£	s.	d.
Say cost of lead, per cwt.	0	16	0
Labour and solder	0	5	0
Waste, say	0	0	6
	1	1	6

11cwt. Milled lead cut to dimensions.

This item is not very precise. The price to be put down for this will be about 16s. per cwt., added to labour cutting.

	£	s.	d.
Say, cost of lead, per cwt.	0	16	0
Labour, cutting	0	2	6
	0	18	6

No. 2. Extra labour to cesspool, including solder.

This item is an extra on labour taken in milled lead and labour in gutters above. Put this at, say, 3s. or 4s.

7cwt. 2qr. Milled lead in gutters, hips, and flashings, including all nails, wall-hooks.

This may be priced at 22s. per cwt., including labour, &c., or—

	£	s.	d.
Cost of lead, per cwt.	0	16	0
Labour, rails, &c.	0	6	6
	1	2	6

No. 2. 4in. bore lead socket pipe, 24in. long, and joints.

This is the pipe from cesspool above taken to the R.W. pipe head. The items may be taken as follows—

	£	s.	d.
Cost of lead, about 12lb.	0	2	0
Labour and solder, say	0	5	0
Fixing to cesspool	0	2	6
Each	0	9	6

The extra for pipe on sheet lead is about 2s., or about 18s. per cwt. Cast-lead bends of this bore cost about 5s. 6d. each, and are often used, being cheaper.

15cwt. 2qr. milled lead in covering cupola. (See detail.)

We cannot accurately price an item like this without seeing the detail. If the cupola is of ogee contour, an allowance must be made for cutting, dressing, welts, clips, copper nailing, soldered angles, rolls, soldered dots, &c., say 35s. per cwt., as the labour would be quite 18s. per cwt.

No. 24. Labour bossed ends to rolls.

Price these at 6d. each.

ARTIFICIAL PRODUCTION OF ASPHALTE.

By the term "asphalte," we must not be understood to mean any rough-and-ready, haphazard mixture of coal-tar and sand or gravel, which, although it is poor economy, will answer under certain circumstances as a fairly passable, and certainly a cheap substitute for the real article, in situations in which the traffic is light, and consequently the wear and tear reduced to a minimum. Although there are three well known and well-defined and distinct varieties of asphalte—namely, the liquid, including naphtha and petroleum, the semi-fluid or viscous, termed mineral tar, and the solid and compact species named asphaltum, it is to the last we intend more particularly to refer. It is by far the most useful description, and is found in different parts of the world in infinitely larger deposits, and a great deal more widely diffused, than either of the other two kinds. The basis of all these natural mineral products, which are essentially hydrocarbons, is bitumen, which is sometimes found in a pure or free condition, but more generally in that of an intimate combination with other substances containing both organic and inorganic matter, which may consist of both animal and vegetable remains. It is important to remember this last classification, for upon it hinges the whole theory of our subject, together with the practical experiments which have been carried out, and from which some very useful results and conclusions have been arrived at, which may eventually have a very important bearing upon the whole question of asphalted public thoroughfares, both vehicular and pedestrian. Many theories have been put forward to account for the origin of bitumen; but, as a matter of fact, little or nothing is known about it. Nor is it of very much consequence. We know its composition with all that degree of minuteness which accentuates and distinguishes modern chemical investigation and analysis. In what manner to produce an artificial substitute is the great point to be ascertained; but by what precise method and in what exact period of time the process was effected in the secret and mysterious laboratory of Nature, although an interesting question, is not one of very much practical importance.

One or two of the theories advanced to account for the origin of natural bitumen may be briefly referred to. Some geologists assert that it is formed by the oxidation of native petroleum, while others attribute it to the decomposition of vegetable matter buried in the earth. A third supposition is that it proceeds from the destructive distillation of animal substances, under the combined action of heat and water, generating steam at high pressure. The truth is that the products of natural bitumen, which are, in consecutive order; naphtha, petroleum, mineral tar, and asphalte, merge into one another by almost imperceptible degrees, so that it is impossible to pronounce accurately where one ends and the other begins. The results of the actual experiments, which were recently carried out by Professor Day in the United States, are certainly in favour of the hypothesis of the natural product being formed by the destruction, under certain conditions of which we are in ignorance, of the organic remains of vegetables and animals. The experimentalist discovered that by distilling a mixture of fish and wood he succeeded in producing a species of asphalte closely allied in all respects to gilsonite. This particular variety, similar to wurtzilite, albertite, and a few others, is found in the Salt Lake district in Utah, and is a glossy solid asphaltum, the substance produced by the gradual transformation of mineral tar. The following is a short summary of the *modus operandi* employed in the artificial production of the new compound.

A mixture of herrings and pinewood was put into an iron retort, the pinewood being partly in small pieces and partly in the state of sawdust. The retort was connected with a series of condensing vessels by an iron pipe 5ft. in length, maintained at a red heat by being passed through a small furnace. Heat was then applied uniformly to the retort, and the distillation continued until the complete carbonisation of the organic matters was thoroughly accomplished. As the products of distillation disengaged themselves they passed on to the vessels placed for their reception at the end of the iron pipe, where they were rapidly condensed into a mixture of water and oleaginous ingredients. These were subsequently dried by the application of calcium chloride, and subjected a second time to distillation. At the end of the operation, there remained in the retort an exceedingly mobile liquid of very dark colour, which, when solidified by refrigeration, was transformed into a solid glittering mass, which it is impossible by mere simple inspection and examination to distinguish from the asphalte from Utah. Several repetitions of the same experiment were undertaken under precisely the same conditions and with exactly the same results. Two additional series of experiments were afterwards conducted. In the first, in which fish alone were used, and in which the whole treatment and process were identical with those employed in the other instance, a very similar substance was ultimately obtained, although with greater trouble. The third and last experiments with wood alone also produced a black shining mass, unquestionably of a bituminous character, but not so pronounced in quality as its predecessors.

Further trials, which are absolutely necessary to establish the manufactured substance upon a sound commercial basis, are in progress, and there is no doubt that a good deal more will be heard about them.

Viewing the matter from a utilitarian, as well a constructive standpoint, it certainly deserves consideration and attention. The price of asphalted roadways varies so greatly in different localities and under different circumstances, that it is impossible to arrive at any reliable average estimate. When constructed in the best manner, and with the best materials, as they always should be in large towns and cities, they are rather an expensive undertaking, as the raw material forms an important item. Any process that will yield an artificial product equal to the natural one, as that manufactured by Professor Day appears to be, and also at a less cost, will greatly enhance the future progress of asphalted thoroughfares, which, even if they cannot be pronounced general favourites, are holding their own very well in London and our large provincial towns.

T. C.

BUILDERS' BENEVOLENT INSTITUTION.

The fifty-second annual dinner of the Builders' Benevolent Institution took place on Thursday, November 23, in Carpenters' Hall, Throgmorton-avenue. Mr. A. E. Parker, of Patman and Fotheringham, Ltd. (the president), occupied the chair, supported by Messrs. J. Howard Colls, S. Young, W. Woodward, J. F. Parker, H. Bartlett, A. Lucas, B. Ellis, R. Cooper, the Master of the Carpenters' Co., Professor Roger Smith, W. Hilton Nash, A. Ritchie, C. Bussell, T. Stirling, J. T. Bolding, and others, the company numbering about 160 in all.

The President gave the toast of "Her Majesty the Queen and the Royal Family," which met with a loyal reception.

Mr. Arthur Lucas gave "The Army, Navy, and Auxiliary Forces," to which Major Brutton (the secretary) and Lieutenant Clarke replied.

The President proposed the toast of the evening, "Success to the Builders' Benevolent Institution." He said that no severe criticism could be applied to this charity, which was open to all members of the trade, provided that the applicant for relief had always held himself as an honest man. At present there were 50 pensioners on the funds, the men receiving £39 per annum, and the women £27. The committee hoped to be in a position in the coming year to elect all the applicants without putting them to the trouble of an election. Being a young man, he looked upon the position he occupied that evening as a great honour, and he hoped that there would be a generous response to his appeal for funds for this most deserving charity. The toast was received with acclamation.

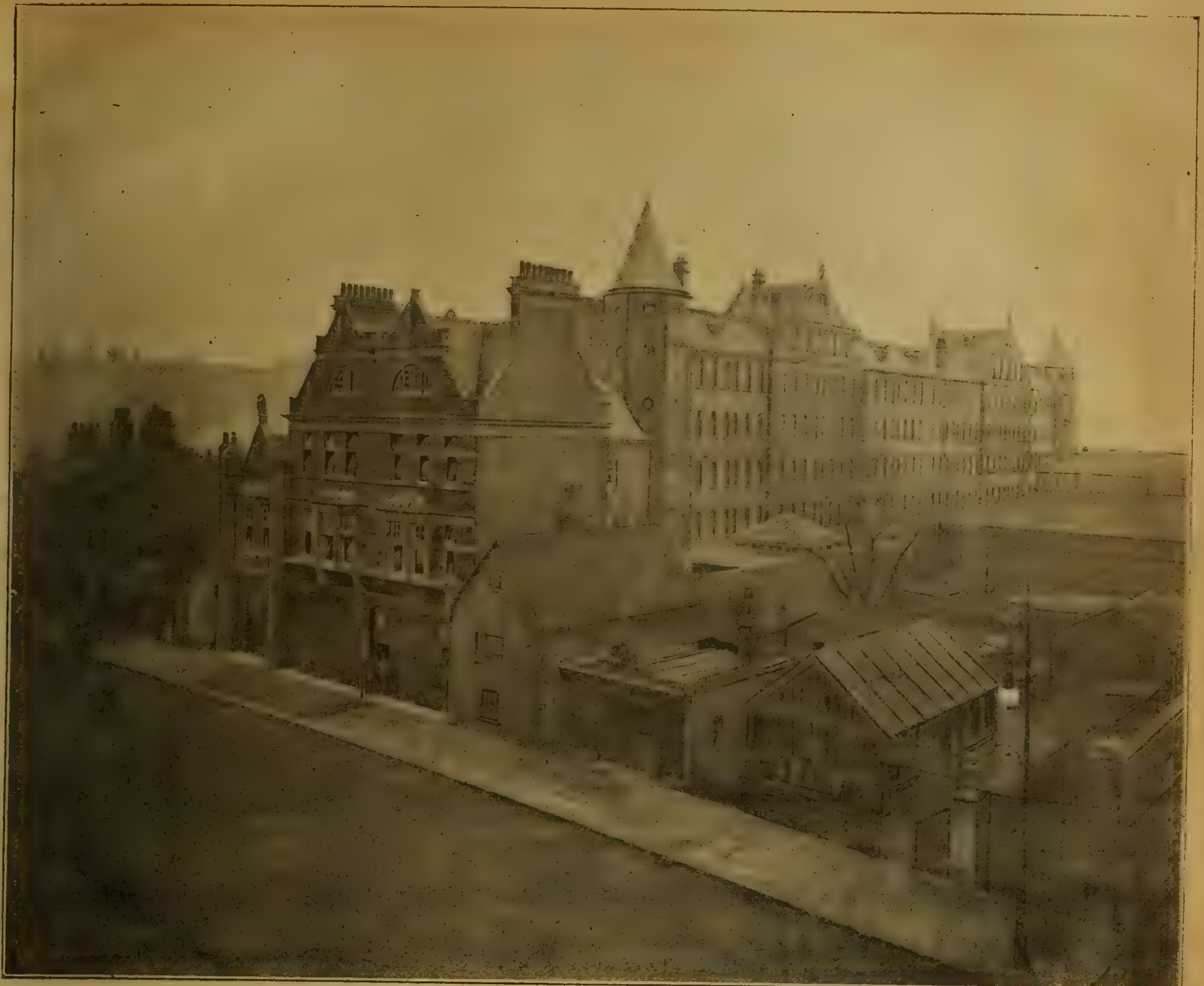
Mr. Basil Ellis gave the toast of "The Worshipful Company of Carpenters." It was a great advantage to have that historic hall for their gathering, and to be associated with a company so closely allied to the trade. The Corporation and the City companies had a great and glorious past, and there was no reason why they should not be even more powerful in the future. Mr. Arthur Jacobs (the Master), in responding, expressed the pleasure the company derived in giving the hall for such a worthy object.

Mr. J. Howard Colls proposed the health of "The President." Although Mr. Parker was a young man, he was a model president, and he took some credit for having been his *entrepreneur*. The building trade, he might add, was a somewhat precarious one, in which the percentage of losses was great and the responsibilities unending, and an institution like this was necessary for those who fell out by the way. The President, in responding, spoke of the great assistance he had received from Major Brutton, Messrs. Stirling, Bolding, Bussell, and others he could name.

Mr. R. Cooper (master of the Distillers' Co.) gave the toast of "The Architects and Surveyors." Like good soldiers they fought for the health and benefit of the community at large, and it was to them that the public looked for wholesome houses and good sanitation. Mr. W. Woodward, in replying for "The Architects," said that wherever there was friction between them and the builders, it was caused by a desire to do the best they could for all sides. Mr. Sidney Young responded for "The Surveyors," adding that the quantity surveyor could produce better effects by his pen than by his tongue. He believed, too, that they had the confidence of the London builders.

Dr. Street gave the last toast, "The Vice-Presidents, Committee, and Stewards," to which Messrs. Alexander Ritchie and J. T. Bolding suitably replied.

Major Brutton, in the course of the evening, announced subscriptions amounting to £959, of which the president's list represented £800, including his own donation of 100gs. The President



ROWTON HOUSE, HAMMERSMITH.—Harry B. Measures, *Architect.*

added latter that through the kindness of a friend the amount would be raised to £1,000.

An excellent selection of music was given, including several piano solos by Signor Tito Mattei, who attended as a guest of the president.

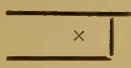
"ROWTON HOUSE," HAMMERSMITH ROAD, W.

ROWTON HOUSE, Hammersmith, which was opened yesterday, is the fourth of a series of "Poor Men's Hotels," known as "Rowton Houses," the property of Rowton Houses, Limited. The first, situated at Vauxhall, opened in 1893, has 475 cubicles; the second, at King's Cross-road, opened in 1895, has 677 cubicles; the third at Newington Butts, opened in 1897, has 805 cubicles; and the present building 800 cubicles. In addition to these, plans have been prepared for a fifth at Whitechapel, with over 800 cubicles.

The building has been erected on a site within two hundred and fifty yards of Hammersmith Station, and has its entrance frontage in Hammersmith-road.

The site consists of two parallelograms, the smaller of which forms the frontage to Hammersmith-road, and has a frontage of 65ft. by a depth of 102ft. to its junction with the larger, which has a width of 160ft. by a greatest depth of 276ft., with a total superficial area of 44,000ft.

The frontage to Hammersmith-road is occupied by the entrance to Rowton House, and three business premises forming part of the building scheme.

The main building has been set back from Rose and Crown-lane (the eastern boundary of site), a distance of 30ft., and from the western boundary, which is now occupied by new adjoining buildings, of but two stories in height, a distance of 25ft., and this, together with large inner courtyards, has procured an abundance of light and air to the building on ground and upper floors; the upper or cubicle floors are planned in this form—  with staircases at the three extremities, the inner courtyard being 60ft. wide and open to the south for access of sunlight to all cubicles and rooms.

The elevations have been erected in pressed Leicester facing bricks, relieved with Fletton bricks and dressings of pinky buff terracotta from Mr. J. C. Edwards, Ruabon. The whole of the interior walling, excepting where glazed bricks are used, is built with Fletton bricks. All brickwork throughout the building has been built in Portland cement mortar. The roofs to front elevations are covered with green slates, nailed direct upon coke-breeze concrete slabs, carried upon steel construction; all other roofs are flat, concrete and steel construction, covered with asphalte. The ground floor of site is covered with a thick bed of concrete upon which, where wooden floors are laid, are solid oak wood blocks, and to other floors cement and granite chippings. The floors are fireproof throughout, formed of concrete and steel, and the staircases and landings are in Portland cement concrete. To avoid a cavity between surface of concrete and flooring the floor-boards are nailed directly upon the concrete to cubicle floors. Especial care has been exercised in the planning and execution of all the sanitary work, both in the portion underground and the plumber's work.

The building is divided for administrative purposes into five sections. 1. Superintendent's apartment, with separate accommodation for office clerk. 2. Bed-makers. 3. Catering section, which includes sleeping accommodation for females employed in shop, kitchen and scullery. 4. Lodgers' day-rooms. 5. Lodgers' cubicles. The sections 1, 2, and 3 are planned so that there is no communication whatsoever between them and the lodgers' section 3 and 4, except by passing in view of the clerk's office at the entrance on ground floor. The architect is Mr. Harry P. Measures, of 16, Great George street, Westminster.

PARTY-WALLS UNDER THE LONDON BUILDING ACT, 1894.

AT the ordinary general meeting of the Surveyors' Institution, held last Monday evening, a paper was read by Mr. Philip E. Pilditch (Fellow) on this subject, which, as he said, affected most surveyors practising in London. The author claimed to speak with some knowledge of the matter, as having been one of the committee appointed by the Institution to consider and suggest amendments to the measure when it was known as the London Streets and Buildings Bill. It behoved surveyors especially, as the persons who had to administer the Act in many cases where important interests were at stake, to be thoroughly acquainted with its provisions, and prepared to accurately define its practical as well as its legal points. He dealt first with the definition section, and pointed out that the Act of 1894 considerably extended, by sub-section 16, the definition of a party-wall, as laid down in the Act of 1855, making the wording clearer, and bringing in an entirely new class of walls—viz., those forming part of a building, and standing to a greater extent than the projection of the footings on lands of different owners. It was formerly only necessary to decide whether a wall was a party-wall or not, to inquire whether it stood between two existing buildings with a view to separate occupancy. But now, in the case of a wall built against on one side only, the question of the ownership of the soil on which it stands might have to be considered in determining whether it was a party-wall or not. Again, it would seem that mere separate ownership, without distinct staircases and separate entrances from without would not render a floor a party structure. Under the Act all notices served by the building owner are to be upon the "adjoining owner." Under the Act of 1855 "such one of the owners of the premises separated by or adjoining to any party structure as is desirous of executing any work in respect of such party structure shall be called the 'building owner,' and the owner of the other premises shall be called 'the adjoining owner.'" In the Act of 1894 the expression "adjoining owner" means "the owner or one of the owners," and "adjoining occupier" means "the occupier or one of the occupiers of land, buildings, stories, or rooms adjoining those of the building owner." The question arose, Has this alteration of the wording altered the law as defined previously? It had been contended that the expression "or one of the owners" in the new Act was intended to relieve the building owner of the onus of serving all the various owners interested in the property with notices, provided one of them was served, and section 173 of the Act was quoted in support of this contention; but this section merely governed the allocation of the expenses incurred, usually by the building owner, and did not deal with the innumerable questions concerning how and when work was to be done to a party-wall. On the other hand, it was argued that these words of the Act rather accentuated the necessity of giving to each one of such owners the same notices and rights by statute as they previously had by case law. Under section 90 it seemed clear that if one occupier were entitled to anything, all the occupiers must be. For the first time in the history of Metropolitan Building Acts an attempt had been made (in section 87) to deal with the creation of party-walls, and to give certain rights to, and impose certain liabilities on, a person wishing to erect an external wall. By sub-section 1, any building owner desiring to erect a party-wall on the line of junction or boundary of his own and another person's vacant land; and, by sub-section 5, any such owner desiring to build an external wall, might serve a notice on the adjoining owner to that effect, describing the wall, which might then be erected according to the Act, either as a party or an external wall; but there was no provision for the service of a plan or section with the notice. The words of sub-section 6, section 90, and sub-section 1, of section 93, requiring the service of plans and sections, had been found to be of great value in preventing misunderstanding and simplifying proceedings. Sub-section 3 dealt with the payment by the two owners of the cost of building a party-wall, but did not say when the adjoining owner was to make his contribution; but it was presumably not until he made use of the wall by building against it. The word "underpin" had been interpolated in section 88, and had incidentally had an effect on the meaning of section 93. The liability of the building owner to make good damage and to pay compensation was mainly dealt with in section 88, under different sub-sections, with which the author dealt *seriatim*. It appeared, he thought, strange that the important rights given to the adjoining owner under sections 88, 93, and 95 should not also be given under sub-section 6 of section 88 and sub-section 2*a* of section 95, where underpinning or raising is done, in which case consequential damages must often arise. The author then dealt with other points in sections 88 and 95, and proceeded to discuss the position of the "adjoining occupier." Under section 93 the adjoining owner and occupier is entitled to compensation for damage. Under section 90 the *occupier* is entitled to the hoarding, shoring, and other precautions laid down in sub-section 2; and by sub-section 3 the work is to be done so as to cause no unnecessary inconvenience to the adjoining *occupier;* and in sub-section 1, section 90, the building owner may not, without the consent of the adjoining owner and of the adjoining occupiers, do any work unless he has served a notice on the adjoining owner. If he served a notice on the owner, the occupier might apparently be ignored. But the only occupier previously recognised by the Building Acts or by sections 88 and 95 of this Act was an occupier who held an interest of more than one year's duration, and was therefore also an owner. By section 89 the Act gave the adjoining owner power to require the building owner to do such works as might be fairly required for the convenience of the adjoining owner, by giving notice; but the author mentioned a case where an attempt had been made to import an entirely different meaning into the section by serving a counter notice upon the building owner. The Building Act of 1855 laid down in section 85 the rules as to notices, appointment of surveyors, awards, and the like, which were dealt with in the present Act in sections 90 and 91. The length of notice required in respect of a party-wall was reduced from three months to one month, the length of notice in respect of party structures from three months to two months. And not only must the building owner's notice state the nature of the work proposed, but he must also give particulars of it. The case of "Hobbs, Hart, and Co., v. Grover and Roe" was cited as an important decision on this point. Section 90, sub-section 2, made an important alteration in the law by obliging a building owner to make and maintain a proper hoarding and shoring, &c., for the protection of the adjoining land or building and the security of the adjoining occupier. A useful addition to the previous rules was the provision that unless the work to which a notice referred was begun within six months of the service of notice, such notice should not be available for the exercise of any right. The author thought that the words in the first part of section 91, "not specially provided for by this Act," were ambiguous, and might well have been omitted, as it was presumably intended that all differences arising between building and adjoining owners should be settled in the manner provided by this section, by surveyors appointed by the respective owners. If the words mean to exclude from the powers of surveyors so appointed all matters specially provided for by the Act, it would seem that surveyors would never have power to settle party-wall cases at all, for these matters are specially provided for in section 8 of the Act. It would be very desirable, he thought, if the third surveyor were treated in this section—as he invariably was, in fact—as an umpire, competent to sign the award alone. As things now stood, it must also be signed by one of the other surveyors, even if not entirely acceptable to either of them, with the possibility of a deadlock. The author proceeded to deal with the remedies where a surveyor neglects or refuses to proceed, and gave it as his experience that it was extremely difficult to move a Secretary of State to appoint a third surveyor, as provided for in the Act. Section 92 contained a new provision, giving permission for a building owner to enter an adjoining owner's premises for the purpose of executing any work he was entitled to do under the Act by giving 14 days notice, except in the case of emergency, when he must give such notice as may be reasonably practicable. The section (93) affecting the building owner's liability to underpin had given rise to many questions. It was also a question whether, in notices under the Act, the sections under which the notice was served should be quoted. Section 87 of the Act of 1855 gave the adjoining owner power to require the building owner to give security before commencing work for such costs and compensation in respect of such work as may be payable by him. The new Act re-enacted this in Section 94, with the addition of the word "expenses" before "costs and compensation," and also gave the building owner an extended right to require security from the adjoining owner, apparently in the event of the latter's requisition as to building chimney jambs and the like. It has been questioned whether the words quoted brought in a claim for lawyer's and surveyor's costs. The whole position of the matter of party-walls under the new Act might be summarised as follows:—There were many variations from previous law, the effects of which were not yet fully understood. There were in the Act many flaws needing amendment. There were points in which the Act needed amendment in the interests of its ready and fair administration, and there were others only to be settled with the help of a lawyer.

A cordial vote of thanks to Mr. Pilditch was proposed by Mr. Howard Martin, and seconded by Mr. H. T. Steward, and carried unanimously. The discussion of the paper was adjourned to the meeting of the 11th prox.

THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Architectural Association was held on Friday evening, the President, Mr. G. H. Fellowes Prynne, F.R.I.B.A., in the chair. The following gentlemen were elected as members: E. H. Bullock, J. G. Burgess, L. R. Cargill, E. Cooper, J. H. Garry, C. G. Gordon, J. W. Lovell, E. Olarte, N. C. Smith, and J. D. Tate. On the motion of the President, a resolution was passed by acclamation cordially congratulating Mr. R. Elsey Smith upon his appointment as Professor of Architecture and Building Construction at King's College, London, the President stating that Mr. Smith had long taken an active interest in the Association, and had been one of their lecturers since 1891.

ART APPLIED TO THE PRINTING AND WEAVING OF TEXTILE FABRICS.

The following paper on this subject was read by Sir **Thomas Wardle**, of Leek. It was illustrated by between eighty and ninety lantern slides, and also by a sumptuous and very complete collection of examples of silk and velvet and other woven fabrics of all periods, from a great variety of Ancient Christian Coptic burial cloths, dating between the fourth and ninth centuries, taken by the late Miss Amelia B. Edwards and by Professor Flinders Petrie from the graves at Akhinim, Egypt, to the latest productions in silks and velvets of the Leek factories of Messrs. Wardle and Sons, designed by Miss M. E. Clowes, Messrs. Walter Crane, W. R. Lethaby, E. G. Reuter, John P. Seddon, T. Wardle, jun., and others, and others woven by Messrs. Warner and Sons, of Spitalfields and Braintree, Mr. Morton, of Darvel, Mr. Bermingham, and others.

EGYPTIAN TEXTILES.

The textile industry, said the lecturer, is one of the earliest. History and the ancient monuments of Egypt clearly prove its existence for at least 6,000 years. We possess no textiles of that early period, but the paintings in the pyramids show the Egyptians clothed in garments of red, blue, and yellow, with patterned geometrical devices, of which the lotus and papyrus plants and the scaribæus or dung beetle predominate, as well as other motives, chiefly of sacred animals and other plants. It is a pleasing idea that the designing of patterns from the earliest times was predominated by a meaning. The term "unmeaning" so often and so justly applied nowadays, well signifies the patterns as a whole of the last 100 years or more. The meanings which educed the older designs were chiefly symbolical of religious beliefs, as witness one of the earliest Egyptian ornaments, the scaribæus, which has been well described as follows:—"This insect has the remarkable habit of laying its eggs in excrement, with which it envelops the egg, and of forming a little ball. The beetle draws this ball after it with his hind legs until the surface hardens. The ball, which contains the embryo of a new life, and which the heat of the sun will awaken, was to the Egyptians symbolical of the globe, out of which new life would spring, and also of the minuteness of the Creator's work. Likewise, the lotus and papyrus plants which prevail in Egyptian architecture and painting were symbols of the nourishment of the body and mind." A species of serpent whose bite was instant death symbolised the sovereignty of life over death.

ASSYRIAN.

The sculptured records of the Assyrians show that this ancient people were not behind in the textile arts. The next slide shows a piece of the dress of an Assyrian King, upon which are shown figures of men in long, flowing robes, with a variety of mythical subjects, and in the centre is the disc of the sun, ascending on the wings of an eagle, the symbol alike of Egyptian and Assyrian sun worship, below which is the Hom or tree of life, with its pomegranate-like fruit. In the thirty-fifth chapter of Exodus, Moses, speaking of the ten large tapestries of the Tabernacle, says: "Them hath God filled with wisdom of heart, to work all manner of work of the engraver, and of the cunning workman, and of the embroiderer in blue and in purple, and in fine linen, and of the weaver;" and further, in the thirty-ninth chapter, Moses, in speaking of Aaron's priestly dress, states: "And they made upon the hems of the robe pomegranates of blue and purple and scarlet and twined linen." What fruit is there which has dominated artistic decorative design like the pomegranate in all the succeeding ages, and worthily, for it was the symbol of love? Jupiter made the bridal Juno taste of pomegranates. In the circle surrounding the tree of life you will see alternate palmettos and pomegranates; the figures are those of priests. The winged figures are cherubim with human and eagles' heads.

CHINA.

For thousands of years before our era China has practised the weaver's and embroider's arts, and, above all other countries, the materials were chiefly of silk. The printing of fabrics in China and Japan is both curious and interesting. Some of it is done without blocks, especially in Japan, by stencilling through stiff paper in which the designs are cut. This work is often enriched by embroidery being worked upon it, and very artistic effects are thus obtained. Of the antiquity of printing in these countries history does not give us much information; but the treatment of their colouring and designing is of a very traditional kind, the latter belonging to the grotesque and symbolic category; but in flower drawing they excel. We can safely infer from their modern craftsmanship what was characteristic of their ancient work. A great feature of Chinese designing is their adherence to ancient ideals, and a great reluctance to change or to be influenced by modern styles, for Chinese art in textile work, like that of Indian, rests where it has been for ages. Chinese fantastic treatment of figure forms may be said to be typified in their dragons, the most important of which has the head of a chameleon, the horns of a stag, the claws of an eagle, and the tail of a serpent; this is symbolic of supreme wisdom. The next slide illustrates very well this idea. The dragon is the martial device of the Emperor, and that of the Empress is the phœnix. The phœnix, with a peacock's tail and head covered with protuberances, is the symbol of a long and happy life.

BYZANTINE.

The patterned cloths of Byzantium must find a place in our survey, especially as our European museums and churches are rich in vestures of that time, and more especially so from the fact that Byzantine patterns, culminating probably in Justinian's time, did not lose their influence in the pattern-designers' mind for many centuries after—say up to the fourteenth century. It is to the Emperor Justinian that Europe is indebted for the great development of Christain art in architecture and textile designing. In this early era, the first half of the sixth century, a new epoch arose and a new style was inaugurated, and its influence remained as a great artistic power until the thirteenth century. Justinian introduced the cultivation of the silkworm or sericiculture into Europe from China, and was not slow to perceive the great importance of the art of silk-weaving. He caused Imperial factories to be built, and engaged clever designers and weavers from Persia. The influence of Persian ideas in Byzantine patterns is easy to see. Another slide represents a man fighting with a lion; perhaps Hercules fighting the Nemæan lion, Samson slaying the lion, or a representation of Christian martyrs struggling with wild beasts in Rome. The next slide is a representation of two Persian kings hunting lions. Yet another is an illustration of the chariot races which were popular at Byzantium in the time of Justinian. It consists of a figured-centre, with a chariot drawn by four horses. This fabric is to be seen at the Cathedral of Aix la Chapelle. Another represents a rare fabric from the church of St. Mary, Dantzic. It contains an Arabian inscription, "assultan al alim," the wise sultan. This is a later fabric, and belongs to the time of the early Islam ascendancy. Another slide represents a fabric with an all-over Byzantine design of great ingenuity, heralding the diaper work of the Later Gothic times. It is the pattern on the garment in which the German Emperor Otho the Great was buried. This dates from the 10th century. A small portion of the actual cloth is exhibited on the table. Closely associated with Byzantium treatment is the Coptic weaving of the Christian Copts of Egypt, large collections of which have been exhumed from the ancient burial-grounds of Sakkarah and Akhinim, in Upper Egypt, by Mr. Flinders Petrie. Some small specimens are on the table, and I have two lantern-slides, with two figures dancing on one side and the other. The patterning of these cloths is very varied and interesting, and dates from the 4th to the 10th centuries. It is remarkable that the dyes, chiefly red, blue, green, yellow, and purple, are so fast as to have scarcely changed their colour since their entombment, and what is particularly interesting, some of them bear evidence of careful maternal darning. The dead were evidently buried in their holiday garments. There are two reproduced silk fabrics of Coptic patterns on the wall. At Akhinim, as I have just said, a printing-block was discovered, carved in the pattern you will see in the upper part of the slide which I will put on the screen. The tissues, mostly in the form of tunics and other garments, date from the earliest centuries of our era down to the ninth or tenth. Most likely Egypt was the centre of production of this printed work, whence it was for a long time distributed into Western Europe. Akhinim was for centuries celebrated for weaving woollen fabrics. A piece of fine linen printed in reserve—white circles on a blue ground—was found in the tomb of St. Cesarius of Arles—6th century work. A piece of cotton cloth printed in red, gold, and black, representing Ganymede carried away by the eagle, was found in the Church of Quedlinbourg. Professor Lessing considers this piece to date from the 6th to the 8th centuries. On the same screen are a few patterns of the printed fabrics found in ancient France, Holland, Germany, Austria, and Italy, chiefly human-figure subjects with birds, dragons, foliage, pomegranates, and, later on, *fleur-de-lys*.

SARACENIC, SICILIAN.

Next in order follow the interesting designs, both woven and printed, of Saracenic or Sicilian inspiration. One of these is a pattern printed on linen with silver on an indigo ground, and has a treatment of stags and eagles. Another a white wax reserve on a ground of indigo of the twelfth century, and a third is a device of eagles, lions killing ducks. It is Sicilian, and a woven fabric in the museum of the weaving school, Crefeld. In yet another design we see a lion and a hoopoe; it may be inferred that the fabric belonged to the robe of a strong and wise sovereign, since the hoopoe signifies wisdom. Moreover, a little inscription in the narrow border of the stuff says, "The Wise." The next slide is a crowded design, which shows a woman catching a hare with a net, and holding by a chain or cord a hound and a spotted cheetah. Beneath this we see a woman with an eagle. From Arabian symbolism we learn (says Professor Karabacek, of Vienna) that the catching of the hare signifies opulence, marriage, and increase of family. To dream of riding on an eagle's back foretells riches, and if a person should see a woman carried on an eagle's back he will eventually arrive at government. The following slide is a reproduction of a design often used for ecclesiastical decoration. Two stags are fastened with chains, lifting their eyes to Heaven, kneeling. Dewdrops and sunbeams fall from the sun, which is partly hidden by clouds. The stag is supposed to symbolise the soul weary of life and yearning for eternal rest, beautifully expressed in the forty-second Psalm—"As the hart pants after the water-brooks, so panteth my soul after Thee, O God." In the treasury of the church at Maestricht there is kept a piece of stuff which belonged to the garment of St. Servatius, the patron of the church, in which he was buried. The figured part of this design is surrounded by connected circles having a diameter of a quarter of a yard. Within the circles two brothers stand upon a Doric column, perhaps Romulus and Remus, or the two Dioscuri, Castor and Pollux. On each side of the column a bull is being sacrificed. Two angels pour out a libation. The symbolical interpretation of these Sicilian designs is well exemplified in another picture. The dog, the symbol of the human soul, has been freed from this mortal life, as indicated by the broken chain; the eagle, the symbol of Divinity, having descended from heaven to break the chain, now steers the soul to the abode of the blessed, and this action takes place under the shade of the great and mighty tree of the church whose branches overspread the world. This design was probably made for the use of funerals. It is found on a cope from the Church of St. Mary, Dantzic, and now partly in the South Kensington Museum. It is a remarkably effective and interesting subject.

THE ST. CUTHBERT PRINTS.

This and the next slide are facsimile reproductions of white and coloured silk cloths, investments in which St. Cuthbert's body was wrapped A D. 1100, when it was reburied in Durham Cathedral. The account of the original cloths is interesting. In the year 1104, Reginald, a monk of Durham, describing three robes in which the body of St. Cuthbert was clothed, says they were taken off, and describes the three robes by which they were replaced in his time. These last, he says, were of a similar nature to those which were taken off, but of greater elegance. The occasion of the reclothing was the translation of St. Cuthbert's body to the tomb prepared for it in the magnificent new Cathedral of Durham. From A.D. 999 to 1093, it had lain in the Anglican Cathedral of Durham, and from 1093 to 1104 it lay in the temporary tomb prepared for it when they began to pull down the Anglican Cathedral to make way for the present Norman Church. Reginald says that the robe nearest the body in 1104 was "of silk—thin, and of most delicate texture." The next he describes as "costly, of incomparable purple cloth"; the third or outermost was "of the finest linen." When the tomb was opened in 1827 they found first the linen robe and then portions of the two silk robes. One of these robes was of thinnish silk, the ground colour amber, the ornamental parts literally covered with leaf gold, and the fringe a braid of the same colour stitched on with a needle. This is the robe from which the knight with hawk and hound, the rabbits, &c., are copied. Another was a robe of thick, soft silk; the colour had been brilliant beyond measure. It is the urn or island pattern. The ground within the circle is red; the fruit and foliage yellow with red stalks; the urn or flower-basket, the ducks, and the sea red, yellow, and purple; the porpoises yellow and red, and the pattern round the border of the robe red. These two correspond to the description by Reginald of the two robes placed next the body. The translation of the body having been contemplated for so many years, there was plenty of time for having special robes made. It is very tempting to believe that the urn represents Farne Island, blossoming with Christian virtues, and bearing abundance of Christian fruit; the fish and the water birds, St. Cuthbert's porpoises and eider ducks, the knight with hawk and hound, show the great secular position of the Bishop of Durham, and so on. St. Cuthbert's life was chiefly spent in the Monastery at Farne Island, and when he died his body was brought to Durham Cathedral. Up to the time of, and long after, his reburial, there was no silk-weaving in England, therefore the silk cloths must have been imported, and probably ordered, from abroad, the designs printed upon them being of Eastern character, mainly of Persian treatment. At that time, when the Normans conquered Northern Sicily, towards the end of the 11th century, a flourishing school of Arab silk-weavers had been established there for more than a century. The Norman kings, who highly appreciated the beauty of these silken stuffs, granted special privileges to the Arab weavers, so that they continued to work their silk looms under the rule of the Christain conquerors; thus from the 11th to the 14th century Palermo continued to be the chief centre for the production of woven and figured silk. The products of these Sicilian looms were exported widely throughout Europe, especially for ecclesiastical vestments, frontals and dossals. The stuffs woven by these Siculo-Arab craftsmen were of two classes: firstly, the textiles woven before the Norman Conquest, 1080-1090; and, secondly, the textiles of the period when these Arab workmen were employed by their Norman conquerers. In the second period the designs were of endless variety, and showed greater freedom than in the first period, in which the designing done (whether woven or printed) was more, from purely Oriental motives, mostly of Persian origin—such as a warrior on horseback with a hawk on his wrist, attended by a hound. The two chief pieces of printed silk which were used to re-enfold the body of St. Cuthbert in 1104 are valuable examples of the older class. One has the horseman, and the border is decorated with sham Arabic letters. The other which Raine, in his interesting work on the exhumation of St. Cuthbert, took to be a representation of Farne Island, with its rabbits and eider ducks, belongs to the semi-Classical styles of pattern. This proves the antiquity of European tissue-printing, although by Eastern workmen.

ITALIAN TEXTILES.

The artistic weaving of textiles spread from Palermo to Lucca in the middle of the 13th century, and after that to Milan, Florence, Bologna, Venice, and Genoa. The Saracenic styles gradually gave way to the more flowing and geometrical forms of the Renaissance, in which the pomegranate became a leading type, and gradually, by the end of the 14th century, figures of animals disappeared totally. Few of the world's fabrics of any age have been more celebrated than the old Genoese velvets and brocades and the rich fabrics from the looms of Florence and Venice. Italy became, and is also, a silk-growing country, the mulberry flourished there, and with it sericiculture was a certainty. The early Italian dyers practised the tradition of the further East, and with indigo for blue kermes and afterwards cochineal for red, gave them power in tinctorial application which made their coloured fabrics famous and permanent. The permanency of their dyes and the beauty of their colourings gave them for centuries an enviable ascendency.

PAINTER - DESIGNERS: CARLO CRIVELLI, FIFTEENTH CENTURY.

We now come to the Genoese velvet and Italian damask period, the period of the Renaissance and of the Italian painters. Although Italy might have depended more for its Renaissance silk designs upon designers of the craft than upon painters, we know in how many instances painters and architects have excelled, and do still excel, in the decorative treatment of patterned work; and such influence and work can be traced in the designs of some of the great Italian painters' pictures. Take, as an example, Carlo Crivelli, who painted in the middle and latter part of the fifteenth century. In his pictures we see elaborate designs in brocaded silk, as I shall show you further on, indicative and typical of the conventional Venetian brocades and velvets of that time. The patterns he painted are all different in design, but there is a sameness and individuality of diaper treatment which makes me incline to the opinion that he was also a pattern designer for the Italian weavers and printers of those days. The patterns in the pictures of Fra Angelico and Paulo Veronese in the National Gallery are worth studying, being suggestive of earlier patterned treatment, as well as of influences in artistic design which operated for centuries later. I will put upon the screen a few designs taken from robes of Crivelli's pictures in the National Gallery. Mr. Sidney Vacher a few years ago did historical designing a great service by working out the designs of dress in the old pictures of Madonnas and saintly women in this collection. I am indebted to his book for a few of them, and I think you will be of my opinion that these designs were Crivelli's own. In the 16th and 17th centuries designs were in a transition state between the Italians and the later French schools, types of which are to be seen in the three following slides. The diminution in size of patterning was caused by the introduction of Spanish styles of dress throughout Europe. The narrow folds and slashings of the garments required small patterns, which took the character of *fleurs semées* or strewn flowers, as in the next slide. The following three slides show the tastes of geometrical designing in Germany at this period. These patterns are printed in butchers' blue on a white ground on linen, and were used sometimes as cheap altar-cloths. From this time down to Louis Seize, pattern designing underwent a great change. It lost much of that conventional character, which is, after all, the charm and the necessity of a good pattern. We find introductions of naturalistic flowers and foliage; the pomegranate gave way to the flower vase, imitations of ribbons, lace, birds, quadrupeds, horns of plenty, fruit, baskets of flowers, and, lastly, Chinese influences, pictorial representations of Scripture, and other subjects; architectural and *al fresco* scenes, reaching into the 18th century, and culminating in the time of Louis XVI. In the latter part of the 18th century there was a celebrated calico-printer named Oborkampt, whose works were at Jouy, in France. I have two slides of his prints. We now come to the Empire period, or the beginning of the nineteenth century, represented by four slides. For woven designs of the later period, those of Louis XIII., XIV., XV., and XVI., or say from 1600 to 1800, I must refer you to the fabrics on the wall mounted on cards. As a textile printer I have naturally been chiefly interested in the history of printing as an art rather than pattern weaving. But I have one slide of a very pretty floral design of Louis XV., 1750. From 1800 downwards we arrive at distressing decadence, artistic inspiration gave way to commonplace work by commonplace designers, and it is not until we come into what I call the Morrisan period of our own times, that pattern designing as a worthy art has reappeared. But before I illustrate this nineteenth century work, good and bad, chiefly bad, I will place on the screen some pictures of the designers of other countries, chiefly Eastern.

PERSIA.

There is no doubt that printing has been carried on for many centuries in Persia, and has developed to a great extent. A curious thing is that their dye and print works are called "workshops of Christ." According to Persian tradition, Jesus was a dyer. He was apprenticed to a dyer, who ordered him to dye some stuffs in different colours. It is related of him that he threw them all into the same vat. The dyer, alarmed, immediately took them out, and, to his astonisment, each piece came out the colour required! It is pleasing to be able to record another miracle of our Lord's. But perhaps he understood mordants. There is also a palampore printed in Ispahan which shows a richness of bordering peculiar to Eastern decoration treatment.

JAVANESE WAX RESERVE PRINTING.

In Java and Sumatra the printing is done by drawing the design upon cloth with a very small copper kettle containing melted wax. Women generally do this work. They hold the cloth over one hand, and wax or paint in the design with a tiny kettle and its finely-pointed spout or tube. Both sides of the cloth have to be waxed exactly alike.

SPAIN.

Spain was a country which early practised the printer's art. It was no doubt introduced by the artistic Moors, for it is known that in 1234 James I. of Spain issued an edict "estampados," meaning stamped issues. I have only one specimen of Spanish printing. It is a pictorial representation of the Apostle St. Santiago fighting on horseback: it is probably of the last century.

INDIAN BANDHANA WORK.

This is a word used in India to denote tie-and-dye work, from the Hindoo word "bhanda," to tie. It is extensively practised in India, particularly in Jeypore and Ulwar. It was the precursor of printing in the silk handkerchief trade in Calcutta and Bherempur, and is a very remarkable means of producing designs in spots, round, oval, or square, and plaids. Previous to dyeing the cloth, certain parts are tightly tied in a pattern work of wonderful ingenuity, requiring much patience. I have brought two examples in turban cloths and one shawl. At Baroda I bought a very curious example of what we in England would call warp or chine printing—*i.e.*, the warp is printed in pattern before weaving. In this Baroda wedding-robe, however, the geometrical effort is produced by first tieing and dying the warp and the weft, and then weaving the fabric. It is a wonderful example of patience and skill, and is as costly as beautiful. The fabric is among the present collection. Two specimens of Himro brocades woven in Surat are beautiful specimens of Mohammedan work. They are made for rich Arabian merchants. A wonderful specimen of Madras cotton printing of mythological Hindoo subjects hangs on the wall, and exemplifies the importance of wall decoration with meaning to Hindoos. I have a few slides which represent a series of patterns cut upon very old blocks which were given to me in Calcutta in 1886 by a Mahommedan bandhana silk printer. They represent the typical pattern-designing of India. The blocks are very small; some of them are 400 years old. You will easily recognise many of the patterns which have for so long been printed in Lancashire for cotton-dress purposes, derived, without doubt, from ancient Calicut designs like these. The diapers and pine or cone patterns predominate in all Indian ornament; the diaper treatment for centres, and the pine or cones for borders. Among the most artistic and beautiful designs the world has seen are the frescoes in the Caves of Ajunta in Bombay. The decorative treatment is Bhuddistic, and dates from about 2,000 years ago. Since I returned from India I reproduced one of them by the help of Mr. Purdon Clark, the present Director of the South Kensington Museum. It represents the traditional ripe pomegranate fruit being pecked by conventional peacock or other birds. As an example of graceful and artistic conventional decorative treatment I have not seen any designs to surpass it. Native craftsmen in India do not change their craft, their methods, and rarely their patterns. I was frequently told that their forefathers had done the same work from time immemorial. Their favourite way of putting it was:—"My ancestors have worked at this for a thousand years." The love of pattern, ornament, and colour seems to be a part of their nature, and to be almost automatic, although beautifully wrought. Dyeing and printing are two of the great crafts of India. Perhaps you will allow me to tell you a story on the subject, and to relate an incident confirmatory of that story. I have just spoken about the traditional unchangeableness of the craftsmen of India. This is well illustrated in the story of Aboo-Seer and Aboo-Keer, related in Lane's edition of the "Arabian Nights Entertainments," from which I will quote, and which received amusing confirmation in my experience when at Peshawur: "Aboo-Keer was a dyer, who, with his friend Aboo-Seer, a barber, set out from their native place to see other cities. They came to one city at which Aboo-Keer betook himself to the market, and clad himself in costly robes, and proceeded to go about the city and divert himself. He saw it to be a city of which he had not found the like among cities; but all the apparel of its inhabitants was white and blue, without any other colour, and he came to a dyer, and saw that all that was in his shop to be blue; and producing to him a handkerchief, Aboo-Keer said to him, 'O master, take this handkerchief and dye it, and receive thy pay.' The dyer replied, 'The pay for dyeing this will be twenty pieces of silver.' So Aboo-Keer said to him, 'We should dye this in our country for two pieces of silver.' The man rejoined, 'Go dye it in your country; but as for me I will not dye it save for twenty pieces of silver; the pay will not fall short of this sum in the least.' Upon this Aboo-Keer said to him, 'What colour dost thou desire to dye it?' The dyer answered him, 'I will dye it blue.' Aboo-Keer said to him, 'I desire that thou shouldst dye it for me red.' The man, however, replied, 'I do not know how to dye red.' Aboo-Keer said, 'Green.' The dyer, however, replied, 'I do not know how to dye green.' Aboo-Keer said, 'Yellow.' The dyer replied, 'I do not know how to dye yellow.' And Aboo-Keer proceeded to enumerate to him the colours one after another; but the dyer replied, 'We in our country are forty masters, not one more nor one less; and when one of us dieth we teach his son, and if he leaves not a son we are deficient by one. When one leaveth two sons, we teach one of them; and if he die, we teach his brother. Thus our trade is strictly regulated, and we do not know how to dye any colour except blue alone.' So Aboo-Keer the dyer said to him, 'Know that I am a dyer, and I know how to dye all colours. I desire that thou wouldst take me into thy service for pay, and I will teach thee the art of dyeing all colours, that thou mayest glory therein over all the company of dyers.' But he replied, 'We allow not a stranger to enter our trades ever.'" This story was called to my remembrance when I was passing through the bazaars at Peshawar, escorted by an armed sergeant of police, provided for me by the resident, Col. Nisbet, as my interpreter and bodyguard (a necessary precaution in that Kyber Pass and Afridi region). I was particularly struck with the blue-dyeing workshops, and curiosity prompted me to repeat the request of Aboo-Keer, and to try if I could get a piece of cloth dyed any other colour than blue. So I bought a short piece of bleached English cotton at a bazaar close by, and took it to one of the dyers, and told my interpreter to ask the dyer to dye it red for me. The dyer said, "Tell the Sahib I will dye it for him blue." I replied that I did not want blue, but any other colour, preferably red. The man replied, "Tell the Sahib I only dye blue, and I do not know how to dye red." I replied to my interpreter, "Tell him I am a dyer, too, and know how to dye all colours, and I will teach him how to dye red, or green, or yellow." The dyer made a very respectful salaam, but said very firmly, "Tell the Sahib that I and my forefathers have dyed blue for thousands of years, and that I will dye it only blue." No money inducements nor the promised information of the processes of dyeing other colours were of any avail, and so I brought my two yards of white calico to England undyed—an amusing verification of the "Arabian Nights" story, said to have been written 2,000 years ago, and an instance of the unchangeable tradition and practice of arts and crafts in India. And so it is, not only with their caste, craftsmanship, but in their patterns also—practically development in form or colouring.

DESIGNING FOR THE CHURCH, FOR FURNITURE WORK, AND FOR PERSONAL ADORNMENT.

Designing for the Church, for furniture or upholstery, and for personal decoration, have been the three important divisions or uses of pattern work from the earlier times. By the Church I mean all religions and their consequent symbolic expression; and I think I am safe in asserting that the decorative and artistic teaching of religious themes and dogmas holds the highest and most important place; at least, we have seen that it was so in India, in Egypt, and in Europe in the earlier times. The reason of this is not far to seek. All religious beliefs have always had an outward expression, and it was customary for many centuries, and ought to be so still, to offer to God the best, both of art and of all human effort. Witness, as a wonderful example, the products of Gothic art, whether in cathedrals or churches, and their adornment by the best painters and artists in glass, in mosaic, in woven and printed hangings of the greatest possible glory and beauty, in embroidery, in gold, silver, brass, and laten work. With regard to textile decorations, I need not speak further than to ask you to look at the examples of both printed and woven patterned work which hang in this room and upon the photographs I am showing on the screen. Many of the designs are printed ones, others woven, some from the original fabrics, some copied by printing from the best examples of Renaissance and other periods; and they well represent the interior decoration of past and present times of our churches, homes, and for dress.

PAINTERS AS TEXTILE DESIGNERS.

Of the designers, history has shown us tonight that the best painters at one time were also printers. I have, in a paper read before the Society of Arts, called attention to what I believe is correct—that the best painters of the Renaissance in Italy designed also for woven tissues, as I have just stated. As one instance (among others), we cannot go through the National Gallery without feeling that the wonderful and beautiful patterned work on the robes of Madonnas, saints, and royal personages must have originated in the painters themselves. I have only to ask your attention to one of them, Crivelli, who painted, and I also believed designed, in the 15th century. I have shown you some reproduced drawings of his works, which, from a designer's and decorative point of view, are highly interesting. Conventional designing at this time reached its culminating point. After the Renaissance pattern designing slowly and gradually deteriorated, and grew more and more unmeaning, until, in the last century and down to the first half of this, it had become a mere language of flowêrs, and patterns of the most unmeaning and frivolous description. In no domain of art is it more conspicuous than in calico-printing. I defy anyone to look over the Lancashire printer's pattern book of, say, 1800 to 1850 without feeling that artistic design had been dethroned, and in its place coloured patterned treatments had become the order of the day, which were productions of men who for the most part were unable to draw or to conceive an artistic subject, and in the art of colouring displayed the greatest ignorance. English calico-printing owes much to Indian patterns, although deprived of the meanings which generally attach to them there. In this respect the patterns are good, but when the designers were left to their own resources the results were generally inartistic and on the wrong side. This rule, however, was not without its important exceptions, just as Wedgwood in pottery outshone his contemporaries. There are notable examples to be found in English printing of the earlier part of this century of better designing and of good colouring particularly for furniture and upholstery work. Slides 60 and 61 are fair illustrations of this. These patterns date from the middle of the present century and are used for glazed chintzes.

MODERN IMPROVEMENTS IN TEXTILE DESIGNS.

Let us now consider the improvements that have taken in the latter half of this century. In the first place, we must freely acknowledge the influence and teaching of the Science and Art Department at South Kensington in training teachers for the numerous schools of art in the kingdom, well fitted for their work in teaching, drawing, and, to some other extent, design. The state of both design and colouring is much more healthy than ever before in this country, and I believe, from the preference frequently given for English decorative work in both wall-papers and printed textiles on the Continent, that we are assuming, if we have not already achieved, the leading position in these matters. Let me refer to the influence of my late friend, William Morris, a really very great man in whatever department of art you consider him, whether the art of poesy or of ornament. His power, partly intuitive, but mainly acquired by study of olden artistic work in form and colouring, was amazing. I have never met anyone who could approach him. The slightest departure from colour harmony jarred upon his mind and eye like an unresolved discord on the ear. The pains he took to get his colouring right were immense, as were his powers of resolve and work. I should have known but little of printing but for him. After his success in his beautiful wall-paper designing, he appealed to me to join him in an attempt at improving the art of tissue-printing, chiefly for cretonne purposes. Rather rashly I undertook the task, being led on by the charm of his personality and the wide range and power of his artistic ability. He limited me, however, to the most difficult conditions, which may be summed up in a few words—a revival of all the old (and, for the most part, discontinued) processes of producing and applying colour, and an absolute avoidance of all artificial dyes. All the old books of the last four centuries had to be rummaged up, whether Italian, French, or English. The Indian method had to be studied by myself on the spot, and not only the research but the application of such knowledge presented difficulties such as I should not like again to encounter. I will show you his first design (Marygold) for cotton cloth, which for simplicity and beautiful drawing I think he never excelled. I have also a few others of his designing, among which is one which has had a marvellous hold on public taste, and which is yet far from being abandoned —I mean his Honeysuckle design, which up to two years ago had been continuously printed on my tables for more than twenty years, showing a vitality only possessed by patterning, as with painting, of the highest order. Following in his train are other worthy workers in the craft, amongst whom I have selected a few whose designs bear ample evidence of the long-needed revival of healthy and able decorative patterned work.

IN MODERN WORK

the designs on wall-papers and on textiles, the beautiful tapestry of Morris, and the painted glass designed by Burne-Jones are among the finest productions of decorative work for public buildings of ancient and modern times. We are rapidly improving; but it is not only in the home that one sighs for improvement. In street decorations one sees unbounded possibilities, both in architectural design and colouring. Then, again, there are the forbidding cold and colourless interiors of our churches, chapels, and public buildings—the true arenas for artistic decorative treatment—and capabilities far more important than the best canvas pictures ever painted—churches with their cold grey stone walls, so unedifying and comfortless that even whitewashed walls are a relief! Now, mural painting and mosaic in such buildings are slowly, but happily, becoming a necessity. They nobly repay the cost, for, first of all, our places of worship surely need it most. Our narrow insular prejudices have too long banished art from their dreary interiors; but, happily, all that is changing, and patterned beauty, instinct with meaning, is gradually driving back prejudice and ugliness. Many houses in the land possess beautifully-arranged interiors. But the houses of the poorest can be beautiful, and the elevation of taste is the elevation of life. Matthew Arnold wrote, "In art there's truth; take refuge there." Those of us who cannot afford costly art at home can and ought to say, "Let our places of assembly be made as beautiful as collective cost and art applied can make them." There is no better investment for public money. Then we must have art galleries and museums in each and every centre of population, as well as periodical exhibitions of contemporary art-work to elevate and encourage workers and the public in their leisure moments. The mind in its search for happiness must ever seek to triumph over matter, and so reveal the beauties which lie hidden there.

In the still air the music lies unheard;
  In the rough marble beauty lies unseen;
To wake the music and the beauty needs
  The master's touch, the sculptor's chisel keen.

Mr. Lewis F. Day, in proposing a vote of thanks to the lecturer, said he must slightly traverse one or two suggestions that had been made. Sir Thomas Wardle had criticised certain patterns and ornaments as meaningless; but he held that ornament was none the better for having a motive, and none the worse if it did not attempt to tell a story. Motive had nothing to do with ornament. He did not believe that the works of William Morris or Walter Crane were enhanced in value by any mystic meaning that underlay them, nor did the story told add to the pleasure of anyone that contemplated those designs. As an ornament, he also protested against the assumption that the great painters of the Renaissance were designers of patterns in silks and velvets. It seemed most probable that Crivelli designed the patterns of fabrics he represented; but in other cases it was an attempt to back up the little pattern designers with great names. Much of the work of the period in fabrics was, he considered, a great deal too good to have been devised by any painter who was not apprenticed to the trade. In fabric designing the subjects ought to be conventionalised to an extreme degree, and we owed the beauty of the designs to the artist's inability to represent his subjects pictorially.

Mr. Beresford Pite seconded the vote of thanks, remarking that the first aim of a designer of fabrics was to devise an object that would repeat itself over an indefinite space. If a meaning were attached to a pattern, there was a risk that the story might be repeated *ad nauseam*, and to make the modern patterns didactic would be a putting back of the clock. The long sweeping curves and long lozenges that underlay all good Renaissance patterns were most effective in folded hangings and draperies, and lost much of their charm when confined to a wall surface or panel. Looking at the designs shown on the screen and on the lantern slides, it was obvious that the term "style" was used in a very different sense with regard to fabrics and architecturally.

Mr. Sydney Vacher thought Mr. Day was mistaken in supposing that the great Renaissance artists did not design the fabrics they depicted. They would see in the most interesting picture in our National Gallery, by Gonzale, "The Circumcision of Christ," brocade of the same pattern that that artist had depicted in his "Christ and the Disciples at Emmaus," now at Venice. Judging from his paintings, they might assume that Crivelli designed his own fabrics, and that he was justifiably proud of his patterns. As for ornament, he thought they suffered at the present day from too much design. In the works of Alfred Stevens and Alfred Gilbert, they saw what great sculptors could do in the way of designing ornament, and if either had devoted himself to the devising of patterns for fabrics, it was evident the result would have been far superior to the ordinary work of our own day. In the average work there were too much ornament and colour, too little self-control, and too obvious an adaptation from the works of greater men.

Mr. Robbins and Mr. G. P. Baker also joined in the discussion, the latter remarking that a certain class of designs of sixty years ago was attributed by the lecturer to the Manchester printers, but it was also employed by the firms at Waltham Abbey, and by others on the banks of the Wandle and the Cray. The designs of sixty years since were being reproduced for the Paris market last year.

Mr. W. H. Seth Smith and the President also supported the vote of thanks, which was carried by acclamation, and was acknowledged by Sir Thomas Wardle.

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Messrs. H. Shorland and Brother, of Manchester, have just supplied their patent Manchester grates to the Royal Hants County Hospital, Winchester.

EXPANDED METAL.[*]

EXPANDED metal is really the rolled metal plates cut and drawn out, without any waste of material, by very complicated machinery invented by an ingenious American, Mr. Golding by name. In its infancy with unperfected machinery, the material was only of light quality, cut loosely and roughly into meshes, which rendered it an untidy substitute for wire netting, and this was so rough that no one would think of putting it anywhere except out of sight. My first recollection of seeing it used in building construction was as a casing to hold up the concrete filling around steel girders, and as a means of both protecting them from the ravages of fire, which so soon expands and twists iron and steel into such fantastic forms and shapes, and as a substitute for what we call wood "cradling," employed to make a rectangular beam or circular shaft of an H-shaped joist, so that it could be treated in an ornamental way characteristic of the interior of the building. Expanded metal is cut out of plates of brass, copper, or steel, the machine being formed of cutting-teeth, which first take a strip off the edge of the plate, and expand it downways from the flat table; the knives then move laterally, and cut the opposite side of the diamond off the next edge of the plate, each necessary movement to and fro laterally of the machine cutting half a diamond, until there only remains the tightly-fixed edge of the plate, the resulting meshwork being from two to twelve times more than the width of the original plate, which is about 8ft. long. If the sheet is to be used for concrete it needs no further treatment, as rust does not injure it for the purpose; but for lathing, where the chemicals of the plaster might do it harm, it is dipped in a pan of special paint of a varnishing nature, which seems to fix itself on the metal and render it proof against oxidisation. Mild steel of the toughest, strongest, and finest quality is only used in the manufacture of the sheets, as a brittle metal is soon torn and of no use. As the product improved, it came into use for lathing for plastering, and then the perfected machine enabled its uses to be extended, its qualities to be vastly improved upon, and its strength increased, for the earlier materials never added strength to our work. Now we have a clean-cut and, I might also say neat, article of great strength and rigidity, which is now of considerable, and will be of very great, benefit to architects and engineers. It is made of any number of meshes of a diamond pattern from $\frac{1}{4}$in. to 6in. across, being suitable for plasterer's lathing and every other similar kind of work, giving greatly increased strength for whatever purpose used—in addition to which it is vermin-proof and fireproof in a remarkable degree, because it is in such small parts that heat has practically no effect on it in twisting it about. In addition to which, there is absolutely no difficulty in imbedding or enveloping it in any plastic material, so that it can now be used with advantage for floors, partitions, ceilings, roofs, columns, and even outer walls of buildings. I have even seen it employed in making telegraph and signal poles of considerable length, besides which it is excellent for hurdles, fencing, guards to windows, open screens, and for many other purposes where hitherto we have used wirework, which is so loose and mobile. It is also employed on account of its rigidity as a framework for skysigns, guards to machinery (I have seen it used between tram-wheels to prevent anything from getting under a car), and it is being used as a core for lintels, concrete slabs over ducts, and for paving and making railway sleepers, while many of our eminent engineers constantly use it as a binder to concrete walls of reservoirs and the like, Mr. Mansergh having used a great quantity at the Birmingham Waterworks, and it is, to my knowledge, specified by that gentleman for the North Shields reservoirs, where a considerable quantity is required. Leaving its general uses, I will now give you a few of its salient points with regard to its uses as a building material. For floors and roofs it increases the strength almost tenfold, as has been proved by our leading engineers Messrs. Fowler, Baker, and Mansergh, who have subjected it to severe tests, to say nothing of our own local experiments with which I intend dealing later on. In floor construction it is used to give us that resistance to tension which concrete of whatever kind lacks. It is placed at the bottom of the floor, being laid immediately on the top of the centring and punned on to it, care being exercised that the mixture is rammed round the meshes so that they may be completely enveloped. The 3in. mesh is the size mostly used, with strands $\frac{1}{4}$in., and metal $\frac{1}{8}$in. or $\frac{3}{16}$in. according to the strength required; the sheets are usually 4ft. by 8ft., and where a joint occurs a lap of at least 6in. is necessary, which should be specially enveloped by the concrete and its matrix. The concrete should be well mixed and made out of best Portland cement, weighing not less than 112lb. per striked bushel, which is a slow-setting cement with great ultimate strength. The cement should not be fresh, and should be so finely ground that 95 per cent. can pass a 75 sieve—that is 5,625 meshes per square inch, and it should be capable of withstanding a tensile strain of 450lb. per square inch after seven days' immersion in water, increasing to 20lb. per week until it reaches 510lb. in 28 days. The sand to form the matrix, which should be of the consistency of thick cream, should be sharp and clean, being washed if necessary, and the aggregate should consist of three parts of clean smithy clinker ashes, or crushed brick or stone to pass a $1\frac{1}{4}$in. ring, the whole being turned over at least twice when dry, and the water then added by means of a rose. Close centring should always be used. I have heard of floors being laid without it, but the proceeding is bad and the result highly unsatisfactory, as the matrix is apt to percolate through. The centring can generally be struck in ten days: A floor constructed with expanded metal need not have its joists closert han 42in., inclusive, centre to centre, and it can be laid to a minimum thickness of 3in., the usual depth being 4in., which, it will be readily understood, increases the effective height of a room, or reduces the necessary height of the whole building. This is of considerable value in buildings with many floors. Besides this, 4in. only of concrete is a saving in weight of some value, when concentrated. Floors for warehouses and similar buildings are constructed on the lines just laid down; but where the span entails the use of joists of considerable depth, another form of construction is adopted. We all know it is inadvisable, on account of the sagging, to employ girders of greater length than 25 times their depth. (Personally, I do not believe in exceeding 20 times their depth.) In these cases it has been found a great advantage to employ the patent channel-arch floor between main girders, which are spaced about 20ft. apart, and from them a steel channel is sprung from the main girder's lower flanges, these channels being 5in. by 2in. or larger, and spaced 3ft. 6in. to 4ft. 6in. apart, and rising 1in. per foot of span. The channel itself and the spandrel of the arch formed by its curve is filled with concrete, and the metal and floor laid thereon in the usual way, as previously explained. This channel-arched floor is very serviceable, and is coming into general use, having already been extensively used; and, I believe, acres of it are employed in dock warehouse floors, including those of the Manchester Ship Canal Co., where I am told $17\frac{1}{2}$ acres alone have been put down only just lately. Such a floor with only 4in. or 5in. thickness of concrete can be guaranteed to carry safely 10cwt. per foot superficial—a strength not easily attainable under ordinary circumstances without going to very great expense. Of course this channel-arch floor should not be employed from wall to wall without tension bolts to resist the thrust, if the walls do not give a sufficient haunch in themselves. The top of the floor can be levelled off in the usual way for wood blocks, flooring, or asphalte; or it can be finished outright with a smooth surface. It can also be finished with an extra inch or so mixed with coke-breeze, so that the mixture is soft enough to drive nails in and to attach an ordinary or thicker wood floor, while gas or other pipes can also be imbedded in the top screed. Wellways in these floors are easily constructed, a sheet of small mesh being imbedded between the ordinary mesh and the underside of the joist, and bent round the joist and over the top, the space being filled with concrete and finished off like any ordinary facia or apron. This is both neat and proof against fire, as the steel or iron is enveloped. In other cases which require a flat ceiling underneath, an independent ceiling is suspended by attaching the metal lathing with clips to bar hangers 12in. or 14in. apart, which in their turn are secured to the bottom flange of the joists. This, as it were, double floor can have the space between ceiling and joists utilised as an air space which renders the floor doubly fireproof (if such were necessary) or pipes &c., can be run therein, so that we have an eminently fireproof construction which is also vermin proof and sound-proof to a high degree. This latter is a consideration of great value, as most fireproof floors are anything but sound-proof unless we raise the building or lower the effective height of roof by having a counter-ceiling, which necessarily means further expense. Such a double floor as has been pictured with expanded metal for a room 14ft. wide need not take up more than 14in., and its advantages would be considerable with little extra expense. If the space for a double floor and ceiling—and it is only a matter of 4in.—is too limited, then the expanded metal slabs can be rested on the lower flange of the girders, care being taken for economy's sake that the girders are placed equidistant to suit the dead lengths of the metal sheets; but they can easily be cut to required sizes. If the girders are deep, the space above the slab is firred out, and the floor-boards attached to it. The weight of the cement slab and metal varies from 20lb. to 40lb. super., and the ceiling is about 10lb. more.

PARTITIONS AND WALLS.

Partitions, like ceilings, may—though it is inadvisable, as it does not give us the real benefit we are entitled to by using expanded metal—be constructed by fixing the expanded metal lathing to the actual woodwork, which then becomes covered with a sheet capable of resisting fire; but I am afraid the woodwork between two such sheets under great heat would soon become reduced to charcoal; in fact, such a case occurs to me, in which an expanded metal concrete floor and ceiling were placed experimentally, each side wood in floor joists, and then subjected to a very severe fire from underneath. When the fire had been put out, and an inspection could be made, through the inspection holes, the floor joists could not be found, while the floor and ceiling maintained their position; but obviously they were of no effective use, their supports having gone entirely. The best way to construct these partitions is either by the single or double process, in both of which cases nothing but iron, expanded metal, and plaster are used. The single wall is made by fixing rods of $\frac{1}{4}$in. iron from floor to ceiling at 12in. centres, the ends of the rod (cut to exact length) being twisted to form an eye, through which it is screwed to floor and ceiling, and made taut, or with iron joists the loop is placed over a screwed bolt which is attached by clips to the iron joist, and the rod is tightened by a nut which screws on to the thread of the bolt. The lathing is then fixed by wire to the iron rods or studs, care being exercised to break the joints, as a plasterer should bond his ordinary fir lath. The first coat of plaster is then applied, and well pressed to form the key through the meshes. My impressions on seeing this stage of the work for the first time were bad, as the lathing could be pressed and moved backwards and forwards like a strained sheet. I afterwards ascertained that it is advisable to stay the lathing from behind by a horizontal batten while the first coat is being applied, and allowed to set. When this becomes dry and rigid the floating coat is applied on each side, and then the setting coat in the ordinary way. In a very short time we have a solid partition $1\frac{1}{2}$in. to 2in. thick, with level and straight surfaces each side quite as good as is procurable by the ordinary methods. In my opinion it is not advisable to use ordinary plaster —i.e., haired lime mortar, nor, on the other hand, is it necessary to employ special plaster. It has been proved, to my mind, that excellent results—than which we could not desire better—can be obtained by using gauged plaster, with about a third of plaster of Paris or Portland cement. The former dries quicker, and the work can be completed more expeditiously; but the Portland cement gives greater ultimate strength, makes a more satisfactory job, and is, perhaps, a little less costly too. Double partitions are formed in skeleton by a pair of small steel angle irons, stayed together by strips riveted on to keep them the desired distance apart; the stays, or what in a wooden partition we would call the stemming, are arranged according to height, and at each end an angle iron is used, the bottom and top side of which is secured to the floor and ceiling joists. The framework is then covered over with the expanded metal lathing, and plastered as before. In external work the outside is always in cement, and more or less ornamentally treated. I am told that houses of expanded metal and cement external walls are very much in vogue in America, and I have had sent me photographs of very large houses practically built wholly of these materials. The double partition used as an external wall should be secured by occasional angle-iron feet, and holding-down bolts imbedded in concrete with the necessary stancheons and girders as required to support floors and roof, and there is no reason why such a system should not be extensively used in this country. By its adoption we should have light and strong buildings with fireproof qualities in an eminent degree, to say nothing of the sound and vermin proof advantages. We could have even deaf party-walls, as there is nothing in this system to conduct sound, and a partition of the double construction would be a great boon for this reason alone, while the single partition quite deadens any reasonable noise. As to the fixing of joinery, doors, and windows. These are treated by building in the solid frames or windows, and fixing the lathing securely to them before plastering. This is done very easily and effectively, and if they are not secure and rigid when first put in, in a very short time they become quite firm, as soon as the plaster or cement work is anything like set. I find it is not even necessary to run door jambs up to the ceiling, as I once thought was the case. The door can be be banged about without any movement in the partition being apparent; and as this refers to a single partition, there can be no doubt as to the double one. Skirtings or rails can be fixed to soldiers or grounds of wedge-shaped form imbedded in the plaster in the floating-coat, when their adjusting comes in very handy in aiding or saving the plasterers' grounding for true surfaces. In double partitions it would be advantageous to fill in the bottom of the stoothing with breeze concrete, which would give us an attachment for the woodwork, as well as form a stop to any possibility, remote as it may really be, of vermin being able to get into the partition—a result which very often befalls wooden partitions. In short, external and internal walls can be built entirely of these metal and plaster productions, as well as floors of any strength; in addition to which, the roof, whether sloping or flat, is very much within the range of the possibilities of expanded metal. It could be lathed and slated, or asphalted, so that we can have a damp-proof, fire-proof, sound-proof, and vermin-proof building, giving much greater capacity, and yet occupying the same space both of area and height, and costing no more. The materials lend themselves to all imaginable kinds of treatment architecturally, so that you have not to consider what your materials will do, or not do, or be done to, as to injury.

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[*] Read by Mr. J. P. Allen, P.A.S.I., before the Northern Architectural Association, Nov. 29.

COST.

In considering this portion of my subject, I wish to state that the prices set down to each item are what may be considered fair average prices under normal conditions in a period when no fancy prices are ruling. I propose comparing a floor for a dwelling-room 16ft. by 18ft. to carry $1\frac{1}{2}$cwt. per foot super.; one for a public room to carry 2cwt., 30ft. by 40ft.; and one for a warehouse 80ft. by 100ft., to carry 5cwt. per foot super. The dwelling-room floor consists of $1\frac{1}{4}$in. flooring, 11in. by 3in. joists, herring-bone stemming, and wall-plates, with lath-and-plaster ceiling underneath, about $12\frac{1}{2}$in. total thickness, and will cost £15 17s. 4d. To floor over with concrete and iron joists, 18in. apart, with wood (not block) floor and plastered ceiling, will come to £33 11s. 10d. A similar floor with expanded metal, which allows us to spread out the joists—as they are always too strong in the last kind of floor, because deflection has to be considered—would cost £28 2s. 4d. The total thickness of each of these floors is 12in., nearly equalling, for all practical purposes, the wood floor—neither of these are, however, sound-proof, and to make your rooms anything like quiet, you would have to put in a counter-ceiling, which in each case would cost an additional £3—not to mention the value of the 6in. of additional height put on the building; this item might entail anything, but nothing less than 35s. for this one room only. With the wood-jointed floor, the commonest deafening—anything but sound-proof—would cost £4, while you would have a highly inflammable floor, yet a generally common one. The best floor made by the use of expanded metal would be 15in. thick, the 3in. in the first place entailing an extra of 17s. 6d. on the room under notice; but we should have a sound and fireproof floor each of the highest class, for there would be a space between floor and ceiling, and everybody knows that "space" is a non-conductor for sound as well as of damp. A floor of steel joists, expanded metal, concrete floor, and wood flooring, with expanded metal lathing and gauged plaster ceiling would cost £25 15s. The public-hall floor, 30ft. by 40ft., would no doubt have two columns and a main girder running lengthwise, and as this would be equally necessary for all kinds of floors, just as the main walls would be, it may be considered as outside our subject. The Expanded Metal Co. say the reduced weight of concrete required under their system saves in the thickness of the walls and supports; but I personally do not think such worth considering. Who would wish anybody to sail so close to destruction of their building?—and unless a large series of floors came on to one girder or column, I would never entertain the true value of the saving. A wooden floor would be similar to the last, but in two bays, and would mean an expenditure of £82 11s. 9d., which includes deafening, against which a double floor of expanded metal would mean an expenditure of £122 12s. 10d.; but it must be remembered that this would supply every precaution against sound and fire. A 10in. concrete floor with iron joists, floor, and ceiling would cost £162 12s., and this is what we have used hitherto without getting any sound-proof qualities, to secure which a further sum of £13 6s. would have to be expended. A similar floor to the last, but having the joists extended from centre to centre and adding metal between would run to £136 19s. 10d., without counter-ceiling, which, in addition to the £13, might cost anything over £3 15s. for raised walls. The warehouse floor, to carry 5cwt. per foot super. over an area of 80ft. by 100ft., would be impossible with wood unless you used 6in. by 12in. beams at 24in. centres and 3in. flooring, which would cost £697. If we employed concrete and iron joists at 18in. centres it would cost £17 17s., whereas by employing the patent channel floor it would only cost £587 12s.

PARTITIONS.

Partitions can be formed by securing the lathing to the rods, and plastering both sides at a cost of 6s. 4d. per yard super., as against a wooden plastered both sides stoothing at 4s. 2d. per yard; the thickness of the latter being $5\frac{1}{2}$in. as compared with $1\frac{1}{2}$in. with the expanded metal, a saving of space not to be despised where there are a quantity of partitions. A double partition, which is sound-proof, can be contructed for 8s. 4d. per yard super., and the thickness need not be more than 4in.; the price of both these partitions includes for the plastering being gauged.

TESTS.

The object of the Newcastle tests was to ascertain the relative strength of concrete slabs of equal monetary value for floors with and without expanded metal, and I think the result was achieved, though the ultimate strengths of each kind was not altogether as we should have wished it, because the concrete, as a whole, was not of the best owing to the quality of the cement, and the fierceness of the sun to which it was so unusually exposed. The approximate value of the expanded metal was added in concrete to the thickness of the slab without metal, so that with metal it was 5in. thick, and without metal 8in. thick. It was proved that the increase of strength varied from seven to twenty times, although only two sets could thus be compared. Two others could not be broken, as it was dangerous to pile up the loading metal higher, and we had in consequence to forego attaining our end. Each slab, with and without metal, was made out of the same gauging of concrete, and all slabs were tested with their ends or bearings loose; whereas in actual practice they would have been what we call fixed. Sir John Fowler and Sir Benjamin Baker tested this material several times, the result of their experiments being that they reported as follows: "That the use of expanded metal in the case of a 3ft. 6in. span, increases the strength of a flat concrete slab from six to eight times the strength for carrying a uniform load than it would have if made without the metal, and in the case of a 6ft. 6in. span, the strength is increased to 10 and 11 times." Further, "as regards strength, the slabs made without expanded metal did not approach those made with the metal, and that even with a neat cement slab the strength was much inferior." According to this report, the use of a neat cement slab (which cost as much as that in which expanded metal was employed) only showed an augmentation of from twice to three times the strength, as compared with the 3 to 1 mixture, whereas the introduction of expanded metal enhanced the strength from eight to elevenfold. The mean results obtained by these important experiments were as follows:—With a clear span of 3ft. 6in., the slab without expanded metal broke at the weight of 2·57cwt. per foot super. uniformly loaded; while with expanded metal of $\frac{7}{32}$in. by $\frac{3}{32}$in. strand, the breaking-weight was 15·86cwt. per foot super., and with the $\frac{7}{32}$in. by $\frac{5}{32}$in. expanded metal was 19·28cwt. per foot super., and with a clear span of 6ft. 6in. the slab without expanded metal broke at the weight of 46cwt. per foot super., while with expanded metal of $\frac{7}{32}$in. by $\frac{3}{32}$in. the breaking-weight was 4·61cwt. per foot super., and with the $\frac{7}{32}$in. by $\frac{5}{32}$in. expanded metal was 5·07cwt. per foot super. The slabs were all 3in. thick, composed of one of cement, one sand, and two parts of Thames ballast, which is not the best aggregate for obtaining a maximum tensile or transverse resistance. The time allowed for setting before testing was on an average 63 days. Experience demonstrated that metal of 3in. mesh $\frac{1}{4}$in. by $\frac{1}{8}$in. strands gave the best results with slabs of 3in. thickness. And Mr. Mansergh's tests resulted as follows:—With a clear span of 6ft. 9in., the slab without expanded metal broke at the weight of 4·11cwt. per foot uniformly loaded; while with expanded metal 3in. mesh, $\frac{1}{4}$in. by $\frac{3}{16}$in. strands, the breaking weight was 19·75 per foot super. The concrete was in each case mixed in the proportion of 4 of broken rock ($\frac{3}{4}$in. gauge) and sand to 1 of Portland cement, and the age of the slabs was 83 to 89 days.

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THE BRICK TRADE.

THE *British Clayworker*, a periodical devoted to the brick and kindred industries, in its issue for June, 1899, said:—"The astonishing number of new companies in the brick trade is an indication that activity in clayworking is in no danger of falling away just yet. At the same time it does not mean prosperity for all the new ventures, for many of them are merely taking advantage of booming times to work off properties to advantage, while others are hoping to get a share in a business which cannot at present supply the demand. The remark made by an architect in our last issue, that more brickyards *must* be opened up to meet the demand, may be all right from his point of view; but one cannot make good bricks in a hurry, and it is not everybody that can sell them when they are made. By the time that many of our new companies have got first-class bricks to sell there may be a falling-off in the demand, and some of our over-capitalised companies will find that brickmaking is not always a profitable occupation to everybody."

These are not our words, although they express the views of our article of Nov. 3. They are the opinion of the *British Clayworker*, a journal which, in its November issue, indulges in some sarcastic remarks at our expense. We do not, as a rule, notice criticisms of the kind indulged in by our contemporary; but, as it challenges our "want of information," we think it only right to give our readers the reasons for our views. We can assure them that the figures we place before them have been obtained from the most authentic sources.

Why has the *British Clayworker* changed its opinion of June for its opinion of November?

It is well known in trade circles that the *British Clayworker* is the mouthpiece of the Fletton masters. The Fletton trade alone has received any encouragement or help from it. Other brickmakers have generally been favoured with its contempt, if not condemnation. Referring to Kent and Essex, for instance, it talks of "a handful of manufacturers in one district." It is a fact which can easily be proved that Kent and Essex, in spite of the large strides made in the Fletton and other machine districts, is still the most important factor as regards the supply of bricks to London.

The *British Clayworker*, in its October issue, published the following:—

FLETTON, LIMITED.

We understand that negotiations are in progress for the formation of a Limited Liability Company to embrace the leading yards of Fletton and district. We are, not, however, in a position at present to make any definite statement, as nothing up to the time of our going to press has been settled. The acquisition of an output of something like 400,000,000 bricks per annum is certainly not a light undertaking. We shall have something further to say on the matter in our next issue.

The promised "something further" has not yet appeared. We trust our article of Nov. 3 has not disturbed the ideas of those who inspired the paragraph quoted.

The brick trade is naturally one of great interest to our readers. It has been in a state of prosperity for some two or three years. It is a peculiar trade—Three years good and seven years bad, is almost a proverb among London brickmakers. There are two factors—supply and demand. The price of bricks is a somewhat slight item in the cost of a building, much slighter than many suppose. Labour is the principal factor. Five shillings either way in the price of bricks does not make much difference in the cost of a building. If there are fewer bricks than are required, builders will not hesitate about giving a high price, so long as they can get supplied and can get their labour done. On the other hand, if the supply of bricks is in excess of the demand, nothing will tempt the builder to buy them for stock. It, therefore, is a trade of very high or very low prices.

It will be more convenient to take the supply first. From information we have received there were in the Kent, Essex, and Cowley fields—i.e., stock bricks—ready for market on —

October 31, 1896........	380 millions
" " 1897........	452 "
" " 1898........	480 "
" " 1899........	590 "

so that between 1896 and 1899 there is an increase of 210 millions. Surely significant figures!

If we turn to machine-made bricks, we find an increased output since March 31, 1899, of 164 millions per annum, or, to put it in a more striking way, three million more bricks are placed on the market each week than formerly. Take the Fletton district. In the last three years all the old works have largely increased their output, while nearly a dozen new ones have been started, making an increased output of over 200 millions per annum. Some of the Fletton brickmasters have also lately begun to open out in the neighbourhood of Bedford. In other words, the Fletton brick district has practically increased its output from something between 100 and 150 million to over 400 million during the last three or four years. It can, therefore, safely be stated that the supply has largely increased. Has the demand increased in the same measure? We say no.

What has been the result of the heavier stock and the increased output? The Kent and Essex brickmasters have reduced their price 4s. per 1,000, or 10 per cent. The Fletton Brickmasters' Association has regulated the prices for Fletton bricks for some time past; but there cannot be any control now, as consumers are being quoted all sorts of prices, in some cases as low as 19s. per 1,000 for best Flettons in trucks at the works. This is a drop of several shillings per 1,000 in two or three months, and we believe the Fletton Association has recognised this fact.

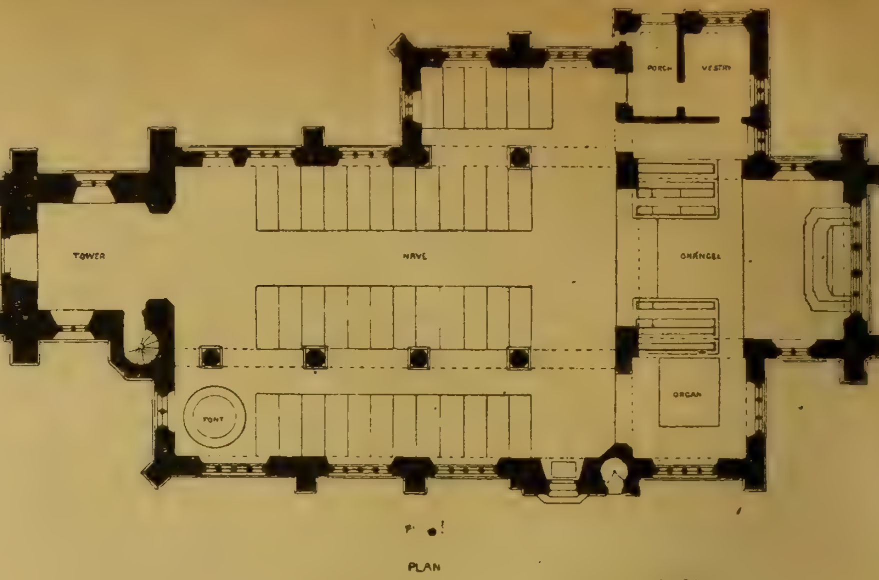
It must further be remembered that Fletton bricks do not and cannot compete with stocks. Stocks are used for facing, Fletton's for inside work. Therefore, in comparing prices, Fletton bricks must be compared with grizzles and place, and if the Fletton prices are to compete, they will have to drop still lower.

Having regard to the fact that the new railway works are now completed, and that there is at present nothing to follow on of a similar nature, to the shrinkage of the speculative building trade, and to the very largely increased supply, we were perfectly justified in expecting the slump which has now come.

* * *

A conference on the taxation of ground values was held at Huddersfield on Friday, and was attended by the representatives of a large number of Yorkshire rating authorities. Mr. F. A. Channing presided, and among the speakers were Sir J. T. Woodhouse, M.P., Mr. Billson, M.P., and Mr. A. D. Provand, M.P.

Torquay Town Council has affixed its seal to a memorial to the Local Government Board for the extension of the borough to include the adjoining townships of St. Marychurch and Cockington. If the petition is granted, the area of the borough will be increased from 1,465 to 5,347 acres, and the population will be raised from 25,534 to 34,401, on the basis of the last census.



BRYANSTON CHURCH.—Mr. E. P. Warren, *Architect.*

CHURCH OF ST. MARTIN, BRYANSTON.

THIS is a new church, completed last year at the sole charge of Viscount Portman, for the parish of St. Martin, situated in his park. The building was performed under the unusual circumstances that its materials were almost entirely provided by pulling down a disused mansion, which stood about 100ft to the northward of the new church, and which gave a supply of Portland, Tisbury, and Chilmark stone just adequate for the latter, and a more than ample quantity of splendid old red bricks. The house further provided some fine oak floor-boards, which were used for ceilings, and stone paving for nave and aisle floors, &c. The church is very substantial, and is faced externally and internally with ashlar, the old face being, as far as possible, retained. The roof principals and ribs are of English oak. The walls are wainscoted with similar material in small panels. The chancel contains an east window designed by Mr. R. Anning Bell, and executed by Mr. A. J. Dix. The organ is an electric instrument by the Hope Jones Co., and is blown by means of an electrical motor, which, as well as the lighting of the church, is supplied from Lord Portman's station about a quarter of a mile distant. The tower has a peal of six bells, by Messrs. Warner. The stone and wood carving are by Mr. L. A. Turner, the glazing by Mr. J. Jennings; while the builders are Messrs. Wheeler Bros., of Reading. The church is intended for a congregation of about 250. The architect is Mr. E. P. Warren, of Cowley-street, Westminster, S.W. The photographs which we have reproduced are represented at the Arts and Crafts Exhibition in the New Gallery.

* * *

The weekly report as to the Estate Market from Tokenhouse-yard is that business has been dull, there being little inclination to treat for properties. The returns, £112,288, are below those for the corresponding week of last year.

The Gladstone memorial organ in St. Thomas's Church, Warwick-street, Liverpool, was opened on Friday. It has been built by Messrs. R. Tabbs and Sons, of Clifford-street, Liverpool.

A corner block of shops in St. Werburgh-street, Chester, between the Corn Exchange entrance and the cathedral, has just been pulled down and set back, and is now replaced by new premises to be known as St. Oswald's Chambers. Mr. John Douglas, of Chester, is both architect and owner. The street widening, towards the cost of which the corporation contributed £1,500, provides an uninterrupted view from Eastgate-street to the cathedral.

The Lowestoft Corporation is adopting a forward policy. The electric light will be installed early next year as a municipal undertaking, at a cost of £30,000, and about £10,000 is to be expended on the extension of the esplanade and the improvement of the South Slopes. By private enterprise new promenade piers will be erected on the north beach and opposite the Empire Hotel, which is rapidly approaching completion. The Duke of Cambridge will visit Lowestoft to-morrow (Saturday) to turn the first sod in connection with the North Pier.

OBITUARY.

The sudden death is announced of Mr. T. Powis Reynolds, a well-known Haverfordwest architect, and for the last nine months the surveyor to the Milford Urban District Council. A local journal mentions that because he was so strict in seeing every detail perfectly carried out he never enjoyed a large practice. He was the successful designer of numerous board and higher class schools, built in the locality and won in competition; also as the restorer of a large number of local churches, and he also designed the local slaughterhouse, and was the inventor of the overhead concave tramway. Mr. Reynolds was in his fifty-fourth year, and leaves a family of seven children. His son, Mr. Gilbert Reynolds, practises as an architect at Trowbridge.

* * *

CHIPS.

Mr. A. H. Campbell, the city surveyor of Canterbury, has been elected surveyor to the urban district council of East Ham, in succession to Mr. Savage, resigned. There were 49 applicants for the post.

Cardinal Vaughan opened, on Sunday, a Roman Catholic church at Ealing erected by the Benedictine Monks.

A Local Government Board inquiry was held on Friday at Todmorden Town-hall by Major-General H. Darley Crozier, R.E. It related to the Todmorden Corporation's application for permission to borrow £1,150 to defray the cost of erecting firemen's houses and a steam-roller shed at Waterside. Mr. Pease, the borough surveyor, appeared for the council. No opposition was offered.

Colonel Marindin, R.E., Board of Trade inspector, visited Leeds on Friday for the purpose of inspecting the route of the electric tram system between the junction of Boar-lane and Briggate and Chapeltown. He was accompanied over the line by Mr. Burbridge (electrical engineer), and other officials.

The tender for the erection of the premises which the Prudential Insurance Company intend erecting on the site of the old Globe Hotel, at the top of George-street, Plymouth, has been secured by a local firm, Messrs. A. R. Lethbridge and Sons, of the Tracy Building Yard. The price is understood to be between £53,000 and £55,000, and the work will take from two to two a half years to complete.

The ceremony of laying memorial-stones of a new chapel and school for the Church of Christ, at St. Helens, Lancs, was performed last week. The buildings will cost about £1,250. Mr. R. Todd, of Southport, is the architect, and Mr. W. Green, of Brynn, the contractor.

A tower screen has been placed in the parish church of Phillack, near Hayle, West Cornwall. It is of West-country-grown oak, and has been designed by Mr. William White, F.S.A., of 36a, Wimpole-street, W. It is a Parclose screen of the 15th century character, relatively plain in character, and planned in four divisions. Tracery fills the upper parts of the openings, which are glazed. The hinges, handles, &c., are of wrought iron. The screen is the handiwork of Messrs. Harry Hems and Sons, of Exeter. When the church was rebuilt in the '50's, the undertaking was carried out from Mr. William White's designs.

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ILLUSTRATIONS.

NEW REREDOS, BRISTOL CATHEDRAL.—CHURCH OF ST. MARTIN, BRYANSTON.—NORTH METROPOLITAN TRAMWAY CO.'S OFFICES.—PORTA DELLA CARTA, VENICE.—FLATS AT KENSINGTON.—JUBILEE FOUNTAIN, CHARLBURY.—COUNTRY HOUSE AT SIBBERTOFT.—PROPOSED COUNTRY HOUSE NEAR BEDFORD.

Our Illustrations.

NEW REREDOS, BRISTOL CATHEDRAL.

The newly completed reredos in Bristol Cathedral, which we illustrate to-day, has been erected as a tribute to the life and work of Dr. Ellicott, as Bishop of Gloucester and Bristol. The reredos was designed by the late Mr. J. L. Pearson, R.A., and has been carried out under the supervision of his son Mr. Frank L. Pearson, by Mr. Nathaniel Hitch, of Vauxhall. The design harmonises extremely well, both in character and detail, with the eastern end of the cathedral. It is executed in Corsham stone, and rises about 27ft. from the floor of the cathedral and is 17ft. 6in. wide. The work includes two richly traceried and buttressed stone screens, which flank the great reredos on the north and south sides, spanning the full width of the sacrarium, and they greatly add to the breadth and dignity of the composition. The whole scheme is so conceived as to portray as it were to the instructed mind the history of the Universal Church in Heaven and on Earth, and it constitutes, indeed, a beautiful form in design and execution, full of unwritten history, and in its symbolic treatment following closely upon that of the early Mediæval architects. Comparatively few visitors, however, have the time and opportunity to study the many storied sculptures with which the whole work is enriched. Highest on the great canopied pinnacles dominating the centre portion, the ideal Church in Heaven is represented by the archangels, St. Michael, St. Gabriel, and St. Raphael, and around them are six angels with expanded wings. The general idea of the central position illustrates "The Glorious Company of the Apostles," "The Goodly Fellowship of the Prophets," "The Noble Army of Martyrs," and "The Holy Church Thoughout all the World." In the centre is the Crucifixion with St. Mary and St. John, the principal niches on either side containing St. Peter and St. Andrew on the one side and St. Paul and St. James on the other, the return ends being occupied by figures of St. Thomas and St. Philip. Separating the larger niches are smaller ones, in two heights, containing figures of Saints from the 5th century to the present time—viz., St. Augustine of Hippo, St. Augustine of Canterbury, St. Chad, St. Hilda, St. Aldhelm, St. Wulfstan; Robert Fitzhardinge, Provost of Bristol, 1170; Eva Fitzhardinge, his wife; St. Thomas of Canterbury, John Wycliffe, William Cánynge (Mayor of Bristol, 1474), Hugh Latimer, Sir Jonathan Trelawney (Bishop of Bristol 1686-9), Joseph Butler (Bishop of Bristol 1738-50), author of the "Analogy"; Hannah More, and Charles John Ellicott, now Bishop of Gloucester. The sculptor has had the advantage of reproducing the likeness of Bishop Trelawney (one of the Seven Bishops sent to the Tower in 1688), from a portrait placed at his disposal for the purpose by Sir William Trelawney. Beneath the Crucifixion and the venerable figures of the Apostles is a plain panel, made to receive the beautiful cross of the cathedral, and flanking this are figures of saints of the Early Church: St. Cecilia, St. Catherine, St. Polycarp, St. Stephen, St. Alban, St. Lawrence, St. Agnes, St. Perpetua, and St. George. On either side of the altar are representations of Old Testament saints and Prophets. On the right, reading upwards from the floor, are Abraham, Moses, Samuel, David, and Elijah; and on the left Isaiah, Jeremiah, Ezekiel, Daniel, and Malachi. As the Bishop of Gloucester has lately said, both in conception and in execution, the new reredos is a splendid example of Christian art. Mr. Hitch is particularly able in the treatment of Mediæval figurework, and the architectural details of the whole structure have been most skilfully worked to by him, from Mr. Pearson's details. The total cost has been £2,500.

CHURCH OF ST. MARTIN, BRYANSTON.

(For description and sketch-plan, see p. 728.)

NEW OFFICES, LX. AND LXII., FINSBURY PAVEMENT, E.C.

This building has been designed for the occupation of the North Metropolitan Tramways Co., for their general offices. The basement, ground, first and second floors are devoted to rooms for counting and checking the tickets, advertising office, paying-in office for the conductors, general clerk's-offices, waiting-rooms, and a large room (38ft. by 20ft.) for meetings of the company's shareholders. The 3rd and 4th floors will be used for residential purposes. The elevation is of an attractive character, and it is perhaps chiefly noticeable owing to the fact that buff terracotta and white Portland stone are used in the work, and the rather unusual treatment of this arrangement of colour has a pleasing effect. There is an enriched band of carving between ground and first floor, and this was executed by Messrs. Daymond and Son of Edward-street, Vincent-square. The terracotta was supplied by Messrs. Doulton and Co., and the Coalbrookdale Co. made the stoves and railing to front. The general contractors are Messrs. E. Lawrance and Sons, of Wharf-road, City-road, and the building has been carried out from the designs, and under the superintendence of Messrs. Davis and Emanuel, architects, of Finsbury Circus.

PORTA DELLA CARTA, DUCAL PALACE, VENICE.

The Porta Della Carta at the Ducal Palace in Venice, so called from the placards here exposed to announce the decrees of the Republic, illustrates the Transition from Late Gothic to Renaissance, and was built by Bartolommeo Buon the elder, from 1438-1443, who was the son of Giovanni Buon, who planned the noble arcade and loggia adjoining. The composition is wholly Gothic, and it is only in the details and mouldings, and in the introduction of cupids into the enriched pediment, that the commencement of a new style is to be observed. Colour is introduced into the design by the application of red and blue marbles. The sculpture is crude when compared with the wonderful ornaments on the southern façade of the palace; but, nevertheless, it has all been well studied as to the part it plays in the general design. The drawings were made on the spot from a scaffold which had been erected to obtain plaster casts, which on my return to Paris I noticed were being repeated to form the design of the Italian pavilion at the new exhibition.

G. Salway Nicol.

FLATS IN KENSINGTON.

This lofty red-brick and stone building, now about to be erected on the north side of Kensington-square, will contain on the basement and ground floor three suites, each consisting of dining-room, drawing-room, three bedrooms, kitchen, bathroom, two w.c.'s, and usual offices. The seven upper floors are arranged with a suite on each floor, containing dining-room, drawing-room, four bedrooms, kitchen, bathroom, two w.c.'s, and usual offices. There will be a passenger lift to all the floors, together with a service lift and servants' staircase, with direct communication to all the kitchens. The architect is Mr. G. D. Martin, Pall Mall East, S.W.

JUBILEE FOUNTAIN, CHARLBURY, OXON.

This fountain has been erected principally as a memorial of the Queen's Diamond Jubilee, but also to commemorate a visit Her Majesty once paid to Charlbury. It is constructed of Bath stone, and is erected on a prominent site reached by a flight of steps from the main road. In the gablets are carved a medallion of the Queen, the Royal arms, those of the donor, and the town seal. Above are finials representing the Imperial crown, which also forms the apex of the lamp. On the angles between the gablets are fixed heraldic figures representing the lion and unicorn. The entire cost has been borne by Mr. J. Du Cros, of Charlbury, Oxon. The fountain will be shortly unveiled by the Duchess of Marlborough. The architect is Mr. A. R. Gough, A.R.I.B.A., of Bridge-street, Bristol, and the work has been carried out by Mr. John Kibble, of Charlbury.

HOUSE AT SIBBERTOFT.

This house, which is mostly an addition (the hall and servants' quarters being old), and drawing near completion, is being built for Major Mansel, of Welford Manor, Rugby, at a cost of about £2,700. Externally, the house is built of Whitwick red bricks, the upper story being either tile-hung or half-timbered in the "black and white" style; it is heated by hot water, on the low-pressure system, radiators being placed in corridors and on landings only, and the domestic water supply, which is from a well, and also collected from roofs, is pumped up by means of a hot-air engine, and stored in a large tank in roof. The old outbuildings have been altered, and commodious stabling provided, there being loose boxes and stalls for ten horses, with coach-house, harness room, &c. Messrs. Geo. Sheppard, borough surveyor, and H. Harrison, M.S.A., of Newark, are the architects, and the work has been carried out by Messrs. Tate and Eastwood, of Market Harborough.

COUNTRY HOUSE NEAR BEDFORD.

This house, proposed to be erected near to Bedford, was designed to harmonise with the rural neighbourhood. Local rubble-stone was to be used for the walls, and the upper part stuccoed, the roof covered with dark-red Broseley tiles. The dining and drawing-rooms were given respectively S.E. and S.W. aspects; the large hall would be used as a "family sitting-room" or morning-room. Mr. W. Butler Stonebridge, Oakley, Bedford, is the architect.

M. Brand, the contractor and chief engineer of the Simplon Tunnel works, died at Berne, on Wednesday.

The Blackpool Corporation is now about to commence on its ambitious scheme of widening the promenade, which is now over three miles long. Tenders are being asked for, and work will be put in hand straightaway. First the promenade will be extended south of Victoria Pier, and then built according to plans for widening. The whole general scheme provides for a paved footpath, carriage drive, tramway, and asphalted marine promenade, and the work is expected to take six years.

A meeting of the general committee of the Gladstone Memorial was held in Liverpool, on Wednesday, the Lord Mayor presiding. Photographs were on view of a design submitted by Mr. Thomas Brock, R.A., and in regard to which members of the committee who had inspected it at the architect's studio in London reported very favourably. The design shows a statue of Mr. Gladstone in ordinary dress standing on a pedestal 28ft. high, the statue itself being 10ft. in height. On two sides of the pedestal are seated figures emblematic of Truth and Justice. On the front is a design in relief indicative of Brotherhood, while the panel on the other side represents Progress. The figures and panels are to be executed in bronze, and the architecture in grey granite. It was announced that upwards of £5,000 had been subscribed towards the memorial, and it was decided to offer Mr. Brock the sum named for the execution of the work. The question of the site was not decided.

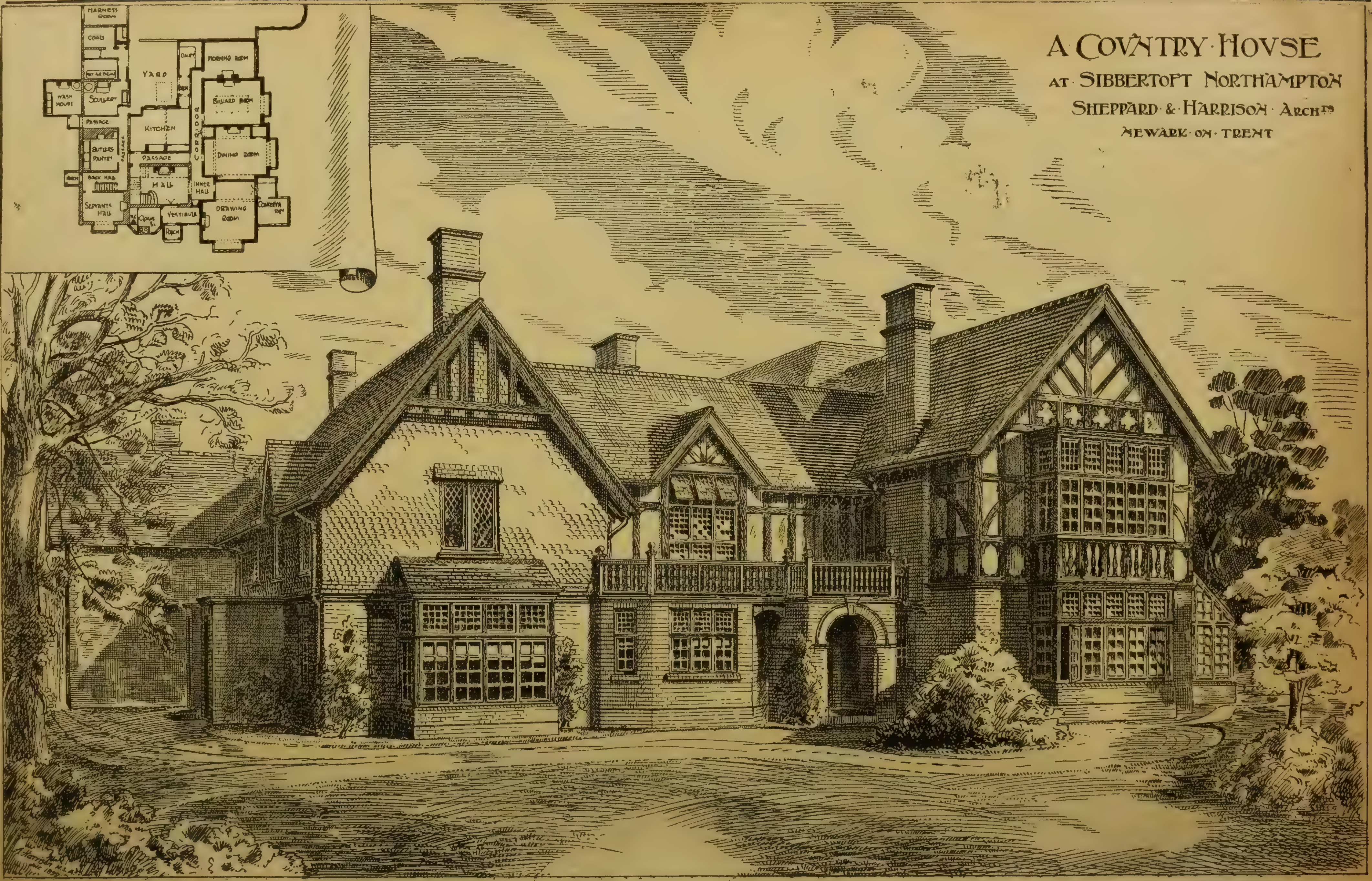
Extensive alterations and improvements are being carried out in connection with the interior of the parish church of St. Peter and St. Paul at Great Missenden, which dates from the beginning of the 12th century. Until recently it contained cumbrous, old-fashioned pews, some of which were approached by separate flights of steps from the exterior of the building. These pews have been removed to provide additional accommodation by the fixing of modern seats, and other work is in hand. The interior of the church has not been renovated since the beginning of the century. It is proposed to spend about £2,500 on the present scheme.

A COUNTRY·HOUSE

AT·SIBBERTOFT NORTHAMPTON

SHEPPARD·&·HARRISON·ARCH^TS

NEWARK·ON·TRENT



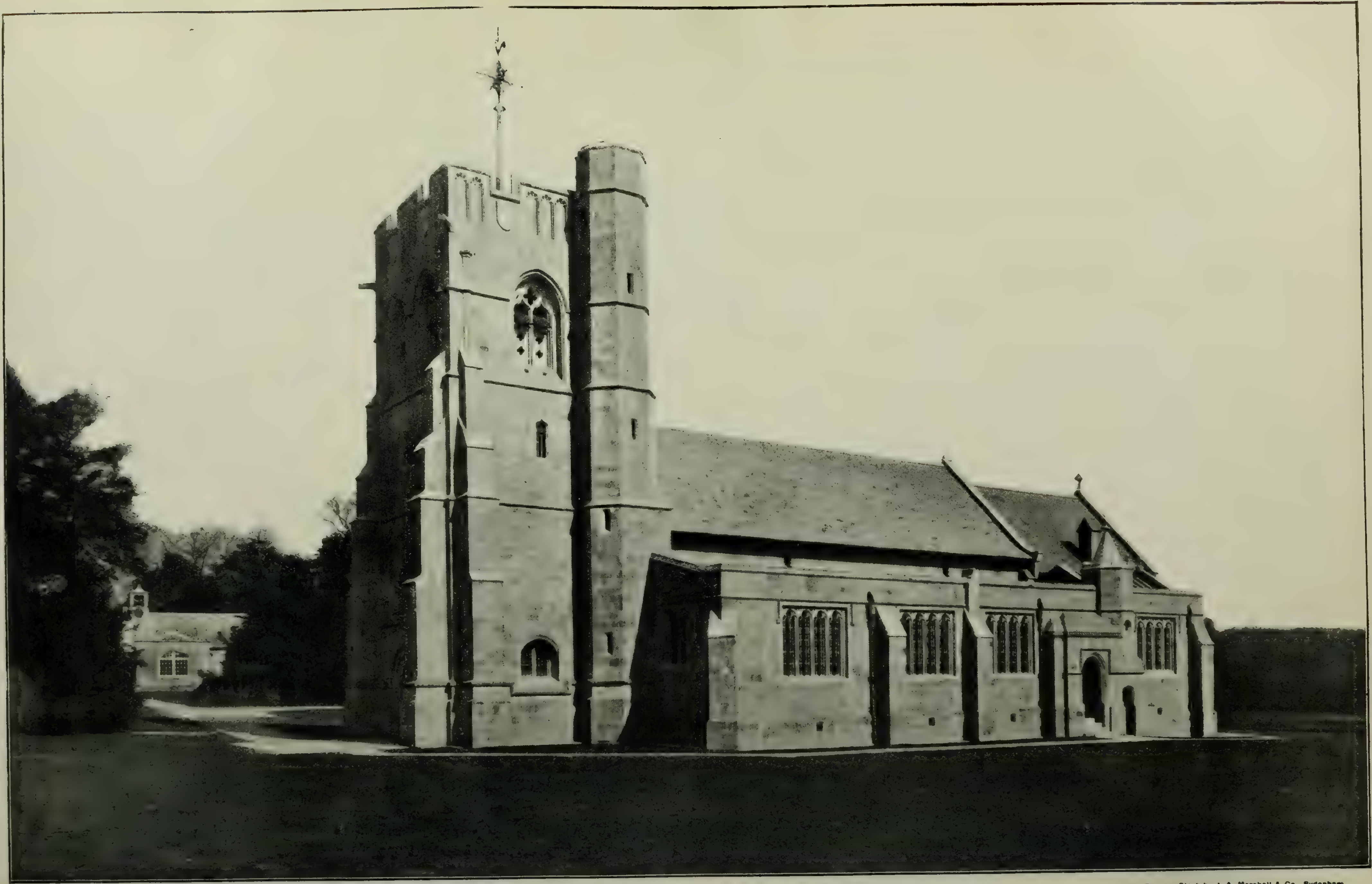


Photo. Process Block by J. A. Marshall & Co., Sydenham

J. Palmer Clarke, Photographer.

CHURCH OF ST. MARTIN, BRYANSTON.

E. P. WARREN, ARCHITECT.

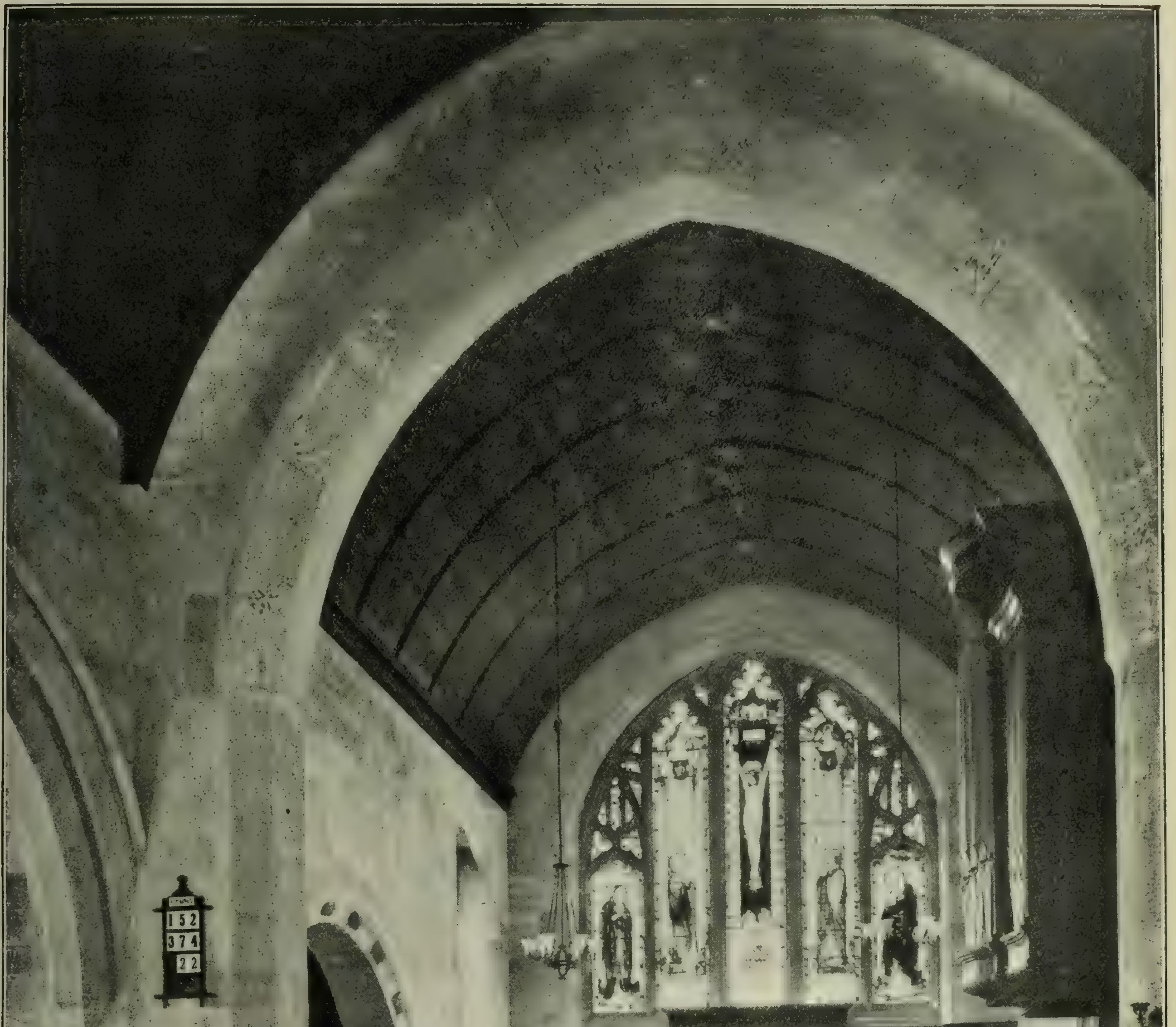
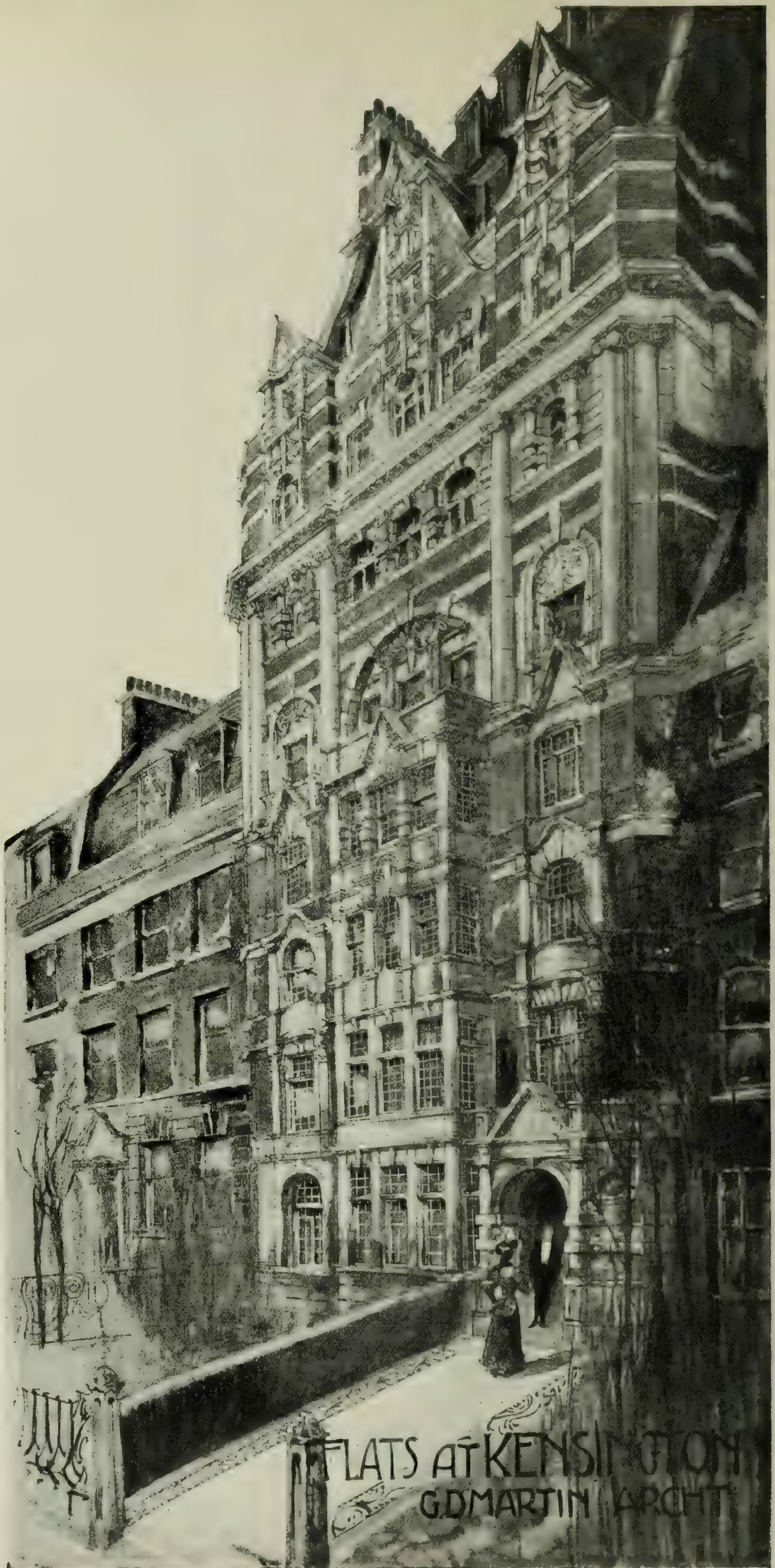


Photo Process Block by J A Marshall & Co., Sydenham

J. Palmer Clarke, Photographer.

CHURCH OF ST. MARTIN, BRYANSTON.
E. P. WARREN, ARCHITECT.


FLATS AT KENSINGTON
G.D.MARTIN ARCHT

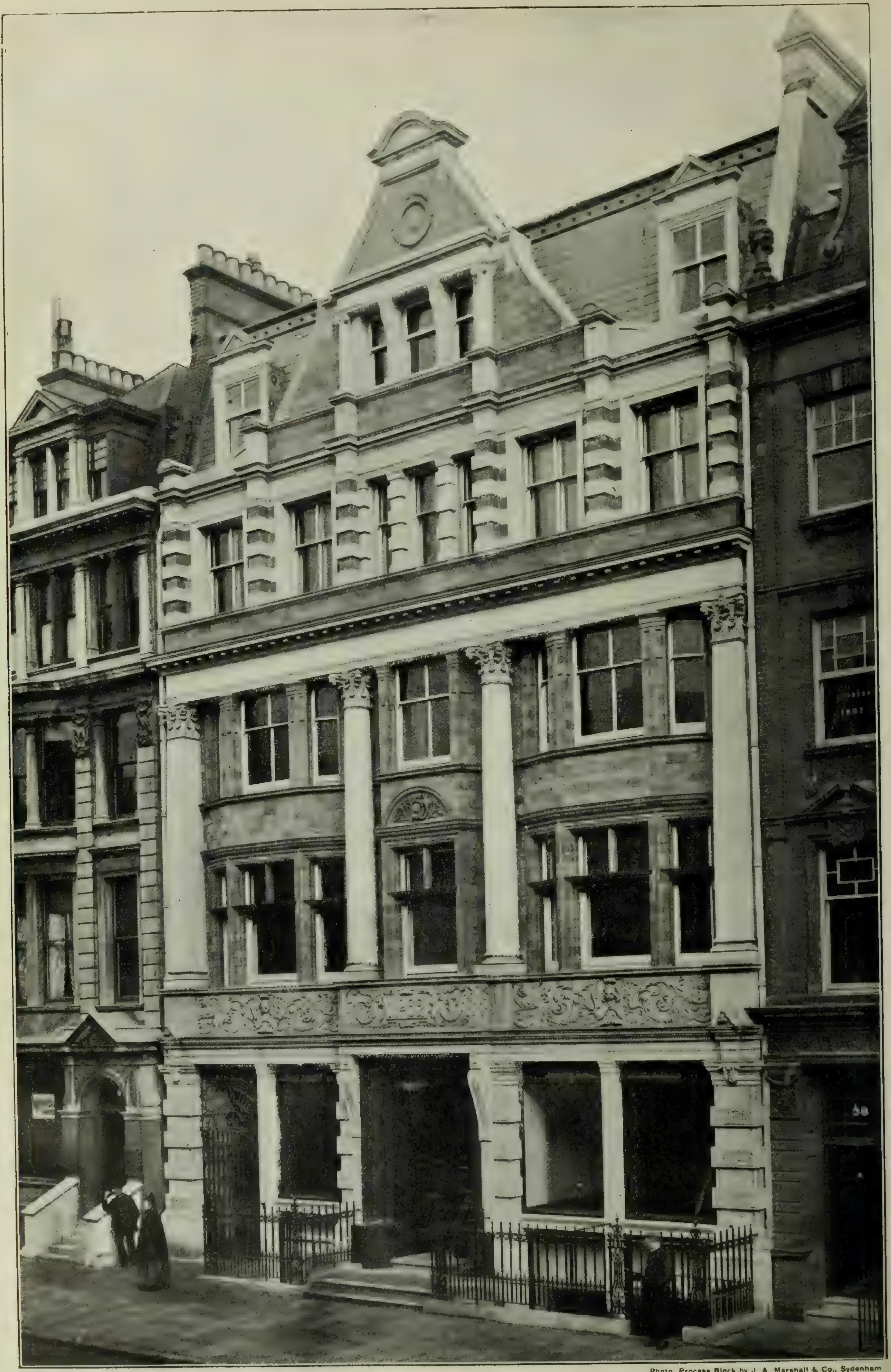


Photo. Process Block by J. A. Marshall & Co., Sydenham

NORTH METROPOLITAN TRAMWAY CO.'S OFFICES, 60 AND 61, FINSBURY PAVEMENT, E.C.

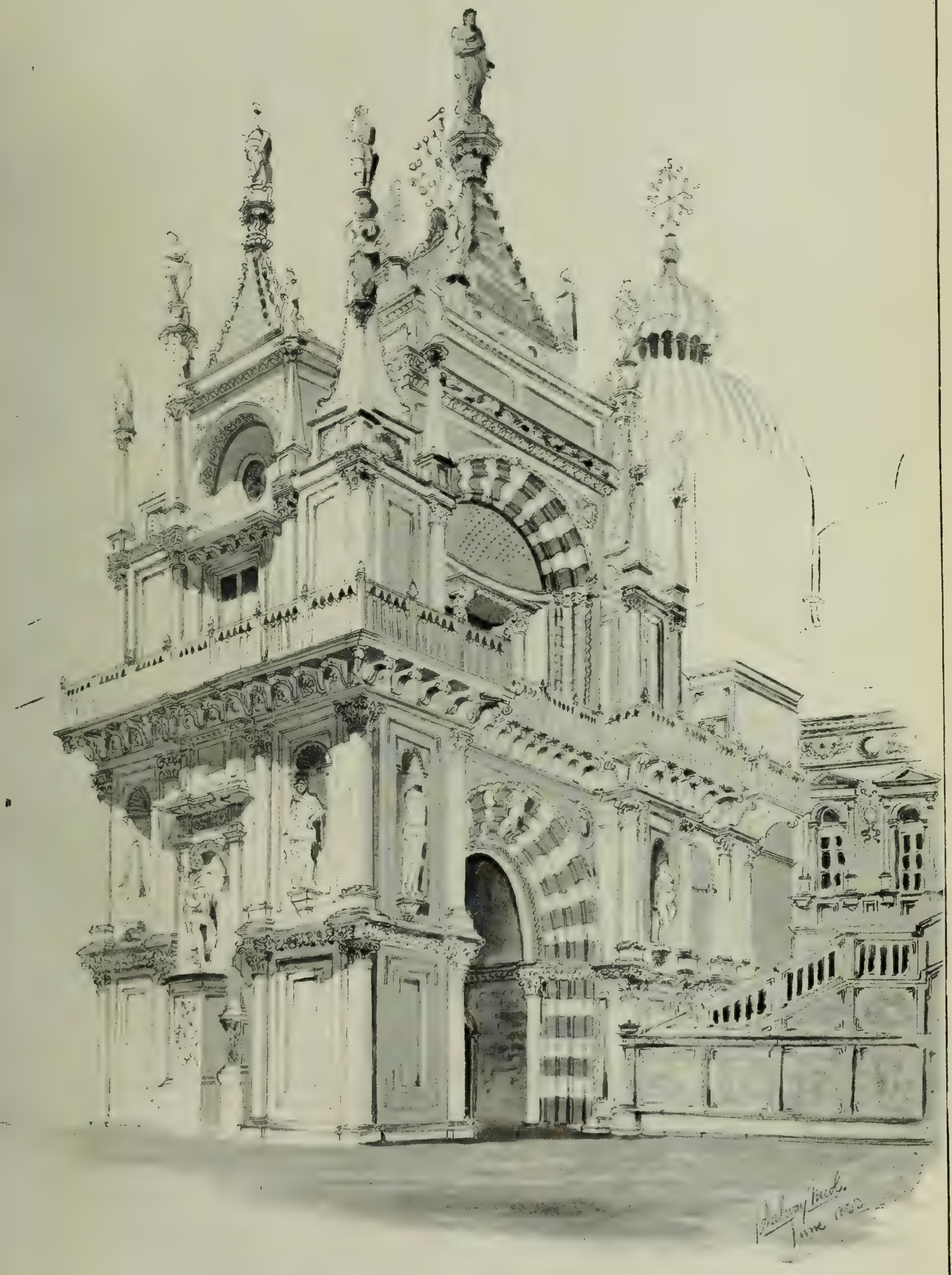


Photo. Process Block by J. A. Marshall & Co., Sydenham

PORTA DELLA CARTA, DUCAL PALACE, VENICE.

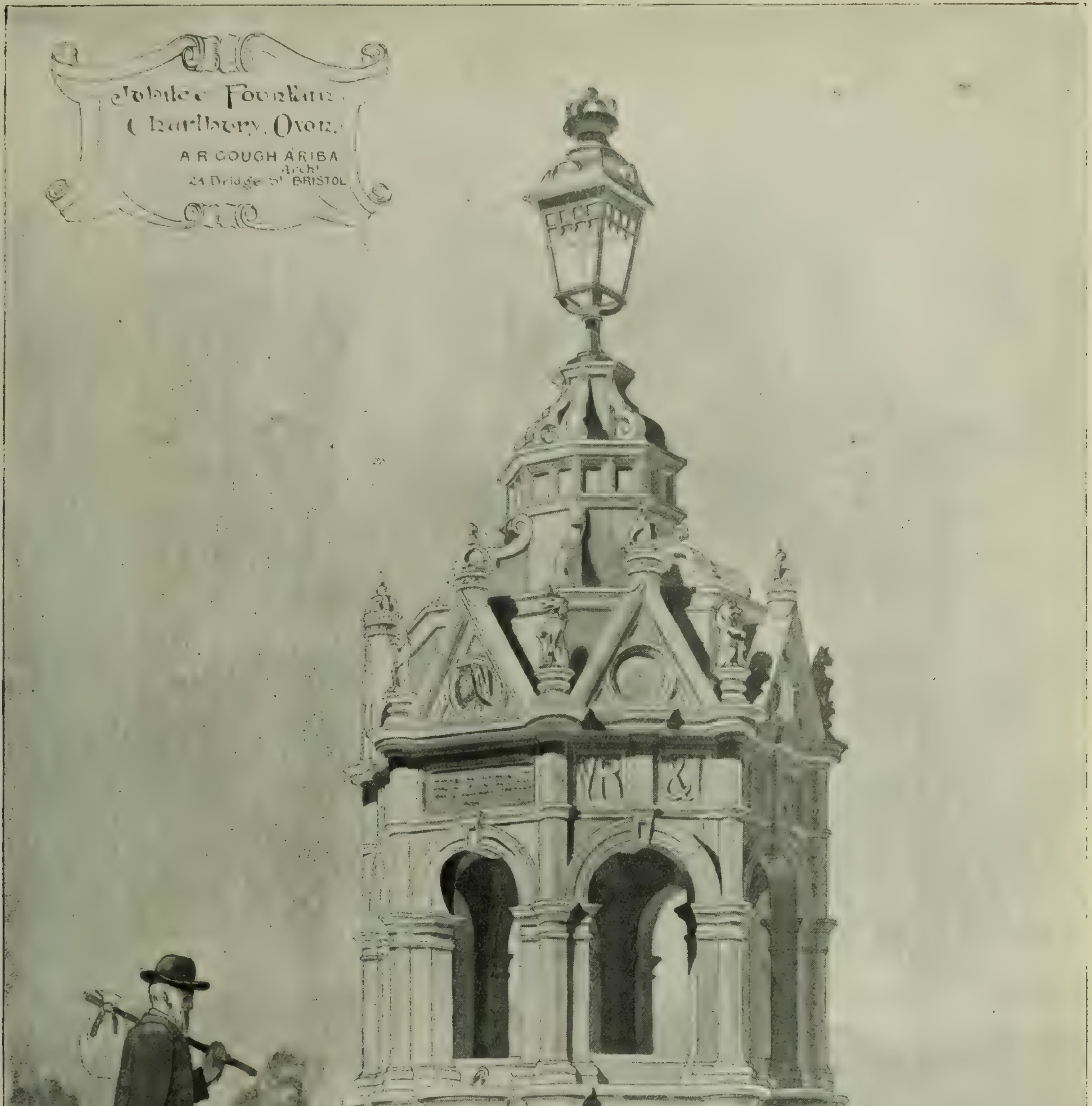
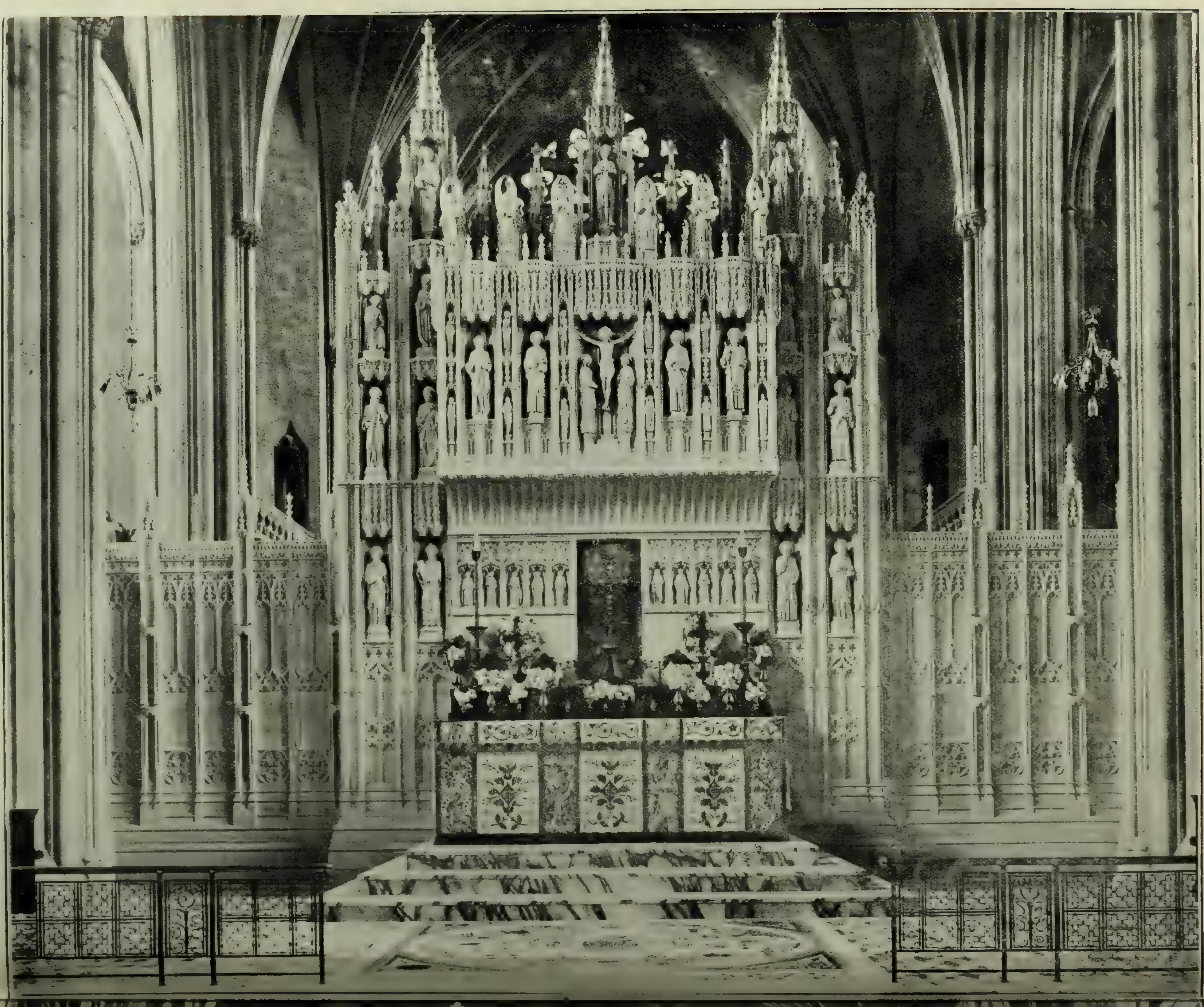


Photo. Process Block by J. A Marshall & Co., Sydenham



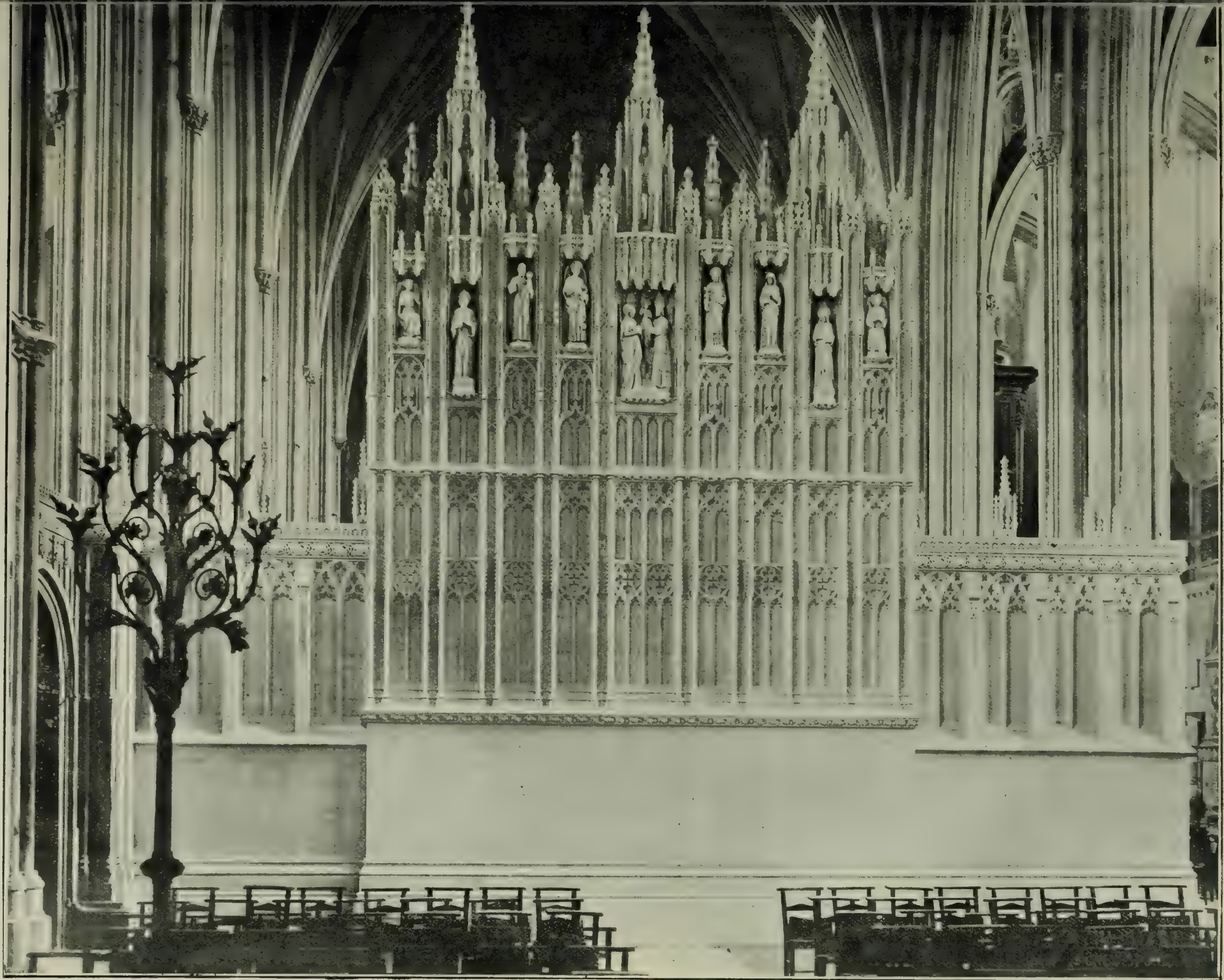
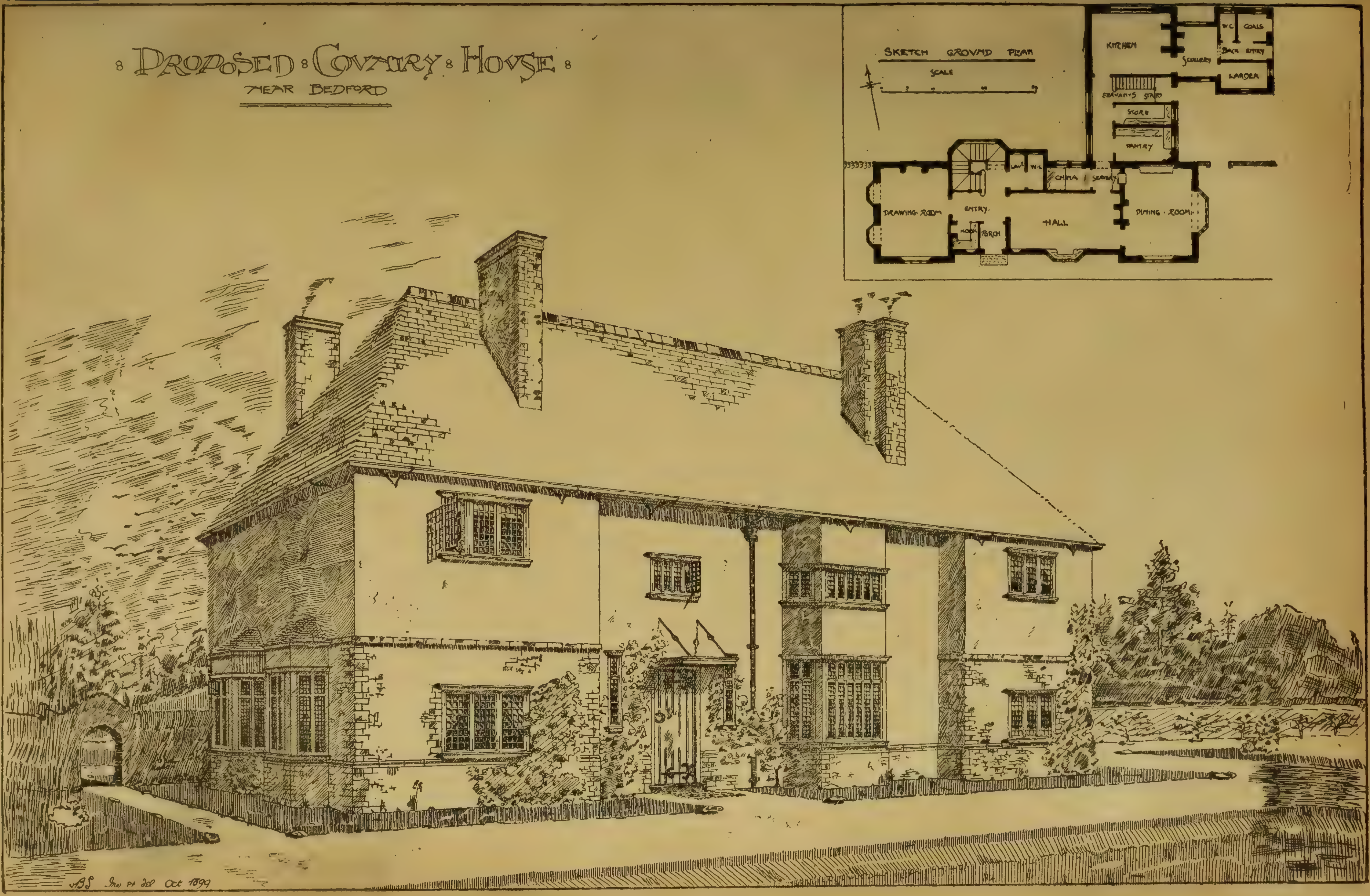


Photo. Process Block by J. A. Marshall & Co., Sydenham.

NEW REREDOS, BRISTOL CATHEDRAL.—THE LATE J. L. PEARSON, R.A., ARCHITECT.
NATHANIEL HITCH, SCULPTOR.


PROPOSED COVNTRY HOVSE
NEAR BEDFORD
SKETCH GROVND PLAN
SCALE
KITCHEN
SCULLERY
W.C
COALS
BACK ENTRY
LARDER
SERVANTS STAIR
STORE
PANTRY
LAVY
W.C
CHINA
SERVERY
DRAWING ROOM
ENTRY.
NOOK
PORCH
HALL
DINING · ROOM
A.B.S. Inv et del Oct 1899

Building Intelligence.

Enfield.—The Bishop of London consecrated the new church of St. Luke's, Enfield, on Wednesday week. It has been erected from plans prepared by Messrs. Brooks and Son, of Wellington-street, Strand, the contract price of the builders being £5,580. The style is Early English, and the building is constructed of red brick, with stone dressings. The edifice consists at present of chancel, north and south chapels, transepts, and one bay of the nave; but it is intended to extend the latter at some future period, so that the ultimate acoommodation will be 800 seats; at present the building will accommodate over 500. A six-light window at the east end filled with stained glass is the work of Messrs. Lavers and Westlake. The subjects are the Crucifixion and the scourging and crowning of our Saviour. Above are representations on each side of the Resurrection and Ascension; while the central light shows our Lord in glory. The stone-panelled reredos has at present painting in three panels, but others have yet to be filled in. The altar, which is of teak, has upon the front some carving by Messrs. Robinson. In the central panel is "The Adoration of the Lamb." Within the altar-rail the floor is laid in Staffordshire tiles. The choir-stalls are also constructed of teak, and behind those on the south side stands the organ, which was supplied by Messrs. Bishop.

Leeds.—A Congregational church and schools are about to be erected in Woodhouse-lane for the church and congregation of East-parade Chapel, the site of which was recently sold to the North British and Mercantile Insurance Co. for £31,000. The buildings will be of stone, in style Perpendicular, somewhat freely treated. The church, capable of seating 800 worshippers, will comprise a wide nave, with narrow aisles, transepts, and apse. The latter will be appropriated to the use of the choir, with organ-chamber at one side. At the junction of the streets an open porch is placed; this forms one of the main entrances, leading to a vestibule, over which is placed a seven-light traceried window terminating in a gable, with small turrets at the angles. At the junction of the nave and transepts next Woodhouse-lane, the tower, with spire, will rise to a height of 130ft. The aisles are divided from the nave by stone columns with arches, over which are the clerestory windows. At the end of the apse is another seven-light traceried window, which is intended to be filled with stained glass. Provision will be made for the erection in the future of galleries in the transepts, these to be approached by staircases and wide corridors connecting the church with the schools and vestries. The school is 64ft. by 34ft., and opening out of this hall eight classrooms are arranged. The two larger ones are situated so that they can be thrown into the schoolroom, when required, by means of patent folding partitions. A ladies' parlour, pastor's and deacons' vestries, infants' rooms, and the caretaker's residence face Hillary-place. The estimated cost of the buildings, including furnishing, but excluding cost of land, is £13,500. The architect is Mr. G. F. Danby, of 10, Park-row, Leeds.

Lynn.—The new reredos in St. Margaret's Church, for which Miss Margaret Blencowe left a legacy of £1,000, was dedicated on Thursday in last week. The designs were prepared by Mr. G. F. Bodley, A.R.A., and the carving was intrusted to Mr. Robert Bridgeman of Lichfield. The structure is of oak. The scene of the Crucifixion occupies the central position, and to the right and left respectively are figures of St. Felix, the apostle of East Anglia, and St. Hugh, a former Bishop of Lincoln, the two panels next these being occupied by archangels. Above is a representation of the Annunciation, and, surmounting the whole, Christ as Salvator Mundi. Surrounding the latter are four of the Latin Fathers, SS. Jerome, Augustine, Gregory, and Chrysostom. Three angels bearing scrolls are placed on each side of the reredos proper, and plain oak panels extend to the north and south walls. These latter panels may at some future date be carved in harmony with the remainder of the structure. The reredos is painted in red and blue and gilded. The Blencowe arms and the borough arms find a place on the reredos; at the base "Gloria, honor, laus," &c., are inscribed, and there is a Latin inscription on the gradine.

National Gallery of British Art.—The new rooms which have been added to this gallery by the donor, Sir Henry Tate, and which more than double its available space—consisting of eight rooms for pictures and a hall for sculpture—were shown on Monday to a number of invited guests by the architect, Mr. Sidney R. J. Smith. Sir H. Tate was prevented by ill-health from being present. The foundations of the Gallery were commenced in September, 1893, and the building was opened to the public by the Prince of Wales on July 21, 1897. Before long, however, Sir Henry Tate came to the conclusion that the requirements of the institution had outgrown the accommodation provided, and decided to extend it by an addition, which has actually more than doubled the size of the original structure. Four of the new galleries are 63ft. long by 32ft. wide, two are 3ft. longer, but the same in width, and the other two are each 32ft. square. The sculpture rooms are each 71ft. in length, and 32ft. broad. The annexe, which is at the rear, comprises eight galleries and large central sculpture rooms, making a total in the whole building of eleven galleries, besides sculptured hall, arcades, &c., with a lineal space for wall hanging of about 3,130ft., while that of the National Gallery in Trafalgar-square is about 3,100ft., and that of the Royal Academy is about 1,700ft. (exclusive of the Diploma Galleries, which have 570ft. additional). The length of the building is about 290ft. The additions are connected with the existing building by four entrances, those in the centre uniting the corridor round the main sculpture hall by arcades. The sculpture rooms are divided in the centre by stone columns of the Doric order, the whole feeling being Pompeian. The entrance doors lead into a long corridor with banded rustication as wall surface. It is estimated that, with this extensive addition, and the costly pictures and sculpture inclosed within its walls, the total value of the Gallery is not far short of a quarter of a million of money. When the galleries are opened to the public in a short time, some of the pictures will be hung in the new galleries, where the light is far better than in the old, and there will be four additions to the Watts' collection—viz., "The Triumph of Love," "Time, Death, and Judgment," "The Court of Death," and "The All-pervading."

Peterborough.—The cathedral restoration work this week enters upon a new phase. Scaffolding now envelops the north-west tower of the façade, and the beautiful south-western gable and arch are freed to observation. Good progress has been made with the groining and the pointing. The old wooden columns are to be replaced by marble shafts. In the south-west gable the wheel window and the two central windows have been glazed, the treatment being similar to that observed in the northern gable. The most important section of the restoration not yet approached is, of course, the central gable.

Mr. Alex. Crockett, builder, died on Wednesday week, at Brechin, from pneumonia, at the age of sixty-two. A native of Brechin, Mr. Crockett, from early years, was employed in the building trade. Having a quarry of his own, he was able to take on and carry out large contracts. He was the builder of the Public Library in Brechin, the hall in connection with Brechin Cathedral, and the recent additions made to the lunatic asylum at Sunnyside, near Montrose. He is survived by a widow and son, who is employed in his father's business.

The Diamond Jubilee District Hospital at Skipton was formally opened on Tuesday by Lady Frederick Cavendish. The hospital is Domestic in style, and has been built to the designs of Mr. Edward C. H. Maidman, of Edinburgh. Provision is made for thirteen patients and for the lodging of four nurses. The total estimated cost is £7,238.

During excavations at a suburb of Bologna a number of tombs of the original inhabitants of Umbria were discovered at a great depth below the surface. The tombs, which contain a number of antique ornaments and utensils, are calculated to be at least 3,000 years old.

In a recent blast at the Bonawe Quarries, Glasgow, 12,000lb. of gunpowder were used, and a solid wall of rock, 250ft. by 150ft. and 50ft. deep, was burst into a pile of stones estimated to exceed 160,000 tons, and to provide two or three years' work for the quarrymen.

A Local Government Board inquiry was held at Burnley on Friday into an application by the Corporation for sanction to a loan of £11,000 for the extension of the gasworks.

COMPETITIONS.

Birmingham.—At the last meeting of the school board a report was received from a committee recommending the appointment as consulting architect of Mr. T. J. Bailey, architect to the London School Board, in the selection of the competitive plans for the Handsworth New-road School, at a fee of thirty guineas and expenses, providing there be not more than twelve sets of plans sent in, any above that number being paid for in proportion. Mr. Pentland raised a protest against the proportion on the ground of economy. Professor Windle thought they would be taking a very serious risk if, by neglecting the expenditure of a sum of that kind, they entailed upon themselves the probability of only getting plans from second-rate architects. The resolution was carried.

CHIPS.

A receiving order has been made in the case of John Charles Coggan, of Barnard-street, Russell-square, W.C., builder.

The new Liberal clubhouse at Farsley, which has cost £3,000, has now been completed. The members are removing into the new building this week, but the formal opening of the premises will not take place until January 13, 1900. The building has been erected from the designs of Mr. W. D. Gill, architect, of Stanningley.

Radford-road board schools, which were commenced at the beginning of the year, from plans prepared by Messrs. G. and I. Steane, are now nearing completion. They will afford accommodation for 212 scholars, boys and girls, and 122 infants. The central hall in the mixed school is 75ft. by 20ft., with separate entrances for boys and girls. From it four classrooms open out. The infants' department consists of a main schoolroom, an infants' classroom, babies' room, and a marching shed. The contractor is Mr. Charles Garlick, of Coventry.

The annual meeting of the Scarborough Master Builders' Association was held at the Albemarle Hotel on Saturday evening, under the presidency of Mr. Councillor Bland. The following officers were elected for the ensuing year:—President, Mr. A. W. Sinclair; vice-presidents, Mr. Councillor Bland, Mr. J. Barry, and Mr. T. B. Jowsey; treasurer, Mr. J. Jaram; secretary, Mr. R. H. Carr.

On Wednesday week the foundation-stones were laid of a new Wesleyan mission-hall at the corner of Skeldergate and Queen's Staith-road, York, and the estimated cost of the building is £2,500. The building will measure about 50ft. by 60ft. On the ground floor there will be a schoolroom, with classrooms opening from it, and upstairs a hall with accommodation for 300 persons. The contractors are Messrs. W. Birch and Son, bricklayers; Mr. John Plows, mason; and Mr. W. Usher, joiner. The architects are Messrs. Hornsey and Monkman.

A faculty has been granted for putting into the parish church of Bradford a new hexagon pulpit of carved oak, resting on a base of Polyphant stone, and also a tower screen of the same wood. Both have been designed by Mr. F. S. Morley Saunders, who was also the architect for the new seats, lectern, and reading-desk, likewise executed in oak.

At the last meeting of the Lambeth Vestry, a report was received from the special committee appointed to consider the expediency of acquiring, as an addition to Brockwell Park, Herne Hill, an area of about 42½ acres adjoining the park. The existing park contains about 84¾ acres. The committee considered that it was imperatively necessary to prevent the erection of buildings on the open space adjacent to Brockwell Park. They therefore recommended that the vestry subscribe £15,000 towards the purchase of the additional land. This recommendation was carried unanimously.

Mr. Uriah Cummings reports upon a new natural cement, discovered in Florida, which is said to occur in enormous masses on the Apalachicola River, near River Junction. When first exposed, the rock is so soft that it can be cut with a spade, but it soon hardens, and, when burned, is said to form the strongest natural cement known. Both the rock and the cement made from it are asserted to be "as white as the finest marble."

At the last meeting of the Pershore Rural District Council, Mr. E. B. Marten, C.E., of Birmingham, reported as to the probable cost of substituting the bacterial method of sewage purification for that provided in the scheme for Pershore recently sanctioned by the Local Government Board. The new scheme, which he described, would cost £1,500, which was a capital cost of £800 more than the original scheme. As a set-off, however, he estimated that a saving would be effected in the working expenses and chemicals and labour of £45 per annum. The bacterial system was approved, and Mr. Marten was instructed to go on with the scheme.

Engineering Notes.

City and South London Railway Extension.—The extended line of the City and South London Electric Railway will be opened in a few days with new stations at London-bridge, the Bank, and Moorgate-street. The line—the first of the kind in the Metropolis—was inaugurated, says a *Times* correspondent, on Dec. 18, 1890, and it then extended a distance of 3¼ miles, from Stockwell, in Clapham-road, to King William-street, with four intermediate stations. Parliamentary powers have since been obtained for extensions in one direction to Clapham Common, and in the other to Islington. These extensions are now being made by Messrs. W. Rigby and Co.; the former will be opened for traffic at the end of February next, and the latter will be finished twelve months hence. Meanwhile the railway has advanced to Moorgate-street by a junction with the existing line to a point about 100 yards on the City side of the Borough Station. This new line runs in two separate tunnels underneath the Thames on the Tower side of London-bridge, and, passing below the present King William-street station at a greater depth by 30ft., follows King William-street to the Bank station, which has been constructed below the foundations of the church of St. Mary Woolnoth. Thence the line is carried to Moorgate-street, where there is a station adjoining that of the Metropolitan Railway. Five lifts have been constructed at the new Bank station—two accommodating 80 passengers each, and three each accommodating 60 passengers. At Moorgate-street there are four lifts, each accommodating 60 passengers. A new station has been built on the south side of the Thames in Denman-street, and a subway is being constructed from thence to the London Bridge terminus of the London, Brighton, and South Coast Railway. The directors of the electric line are being urged to continue their line to Balham and to Tooting; a new electric railway is about to be undertaken from Moorgate-street to Clapton, extending thereafter to Walthamstow, and the Moorgate-street terminus of this line will be connected by means of a subway with the City and South London Railway. The Baker-street and Waterloo Company will next session apply to Parliament for powers to extend their line to the Elephant and Castle, with subway connection at that centre to the City and South London Railway; and power is also being sought to carry the Baker-street and Waterloo line to Paddington Station. When the City and South London Railway brings into use its extension to Moorgate-street, the present King William-street Station will be closed, and a portion of the line from the new junction will be temporarily handed over to the City and Brixton Railway, which will begin from the abandoned line at the exchange station in Denman-street, London Bridge, continue under St. George's-circus, South Lambeth-road, and Kennington-road (with an exchange subway at the Oval Station), to Brixton, where, just beyond the London, Chatham, and Dover Railway, the terminal station of the electric railway will be placed. The new line could be extended to Streatham, Norbury, Thornton Heath, and Croydon. The City and Brixton line will be leased to the City and South London Company, and worked by them from a new generating station at Stockwell. When the extensions to Clapham Common and Islington are completed, they will, with the City and Brixton line, give the City and South London Railway a total mileage of twelve miles. The power developed at the generating station at Stockwell has been increased nearly fourfold. The Bank Station in King William-street has a stone frontage, designed by Mr. Sidney R. J. Smith. The work which has been necessary under the church of St. Mary Woolnoth has, together with the extension to Moorgate-street, been completed by Messrs. J. Mowlem and Co. The church now rests upon seven steel girders, each 53ft. in length, the old foundations having been entirely removed without the least damage being done to any part of the superstructure. Workmen are engaged in replacing the floor and the internal fittings, which, together with the carvings and decorative work, were in the first instance removed and stored away. It is expected that the Central London Railway, establishing a new line of communication from Shepherd's Bush to the Royal Exchange, will also be ready for opening in the spring. Eventually this railway will be extended to Liverpool-street.

PROFESSIONAL AND TRADE SOCIETIES.

Glasgow Architectural Craftsmen's Society.—The usual meeting of the above society was held at the rooms, 204, Great George-street, on Friday, November 24, when a discussion took place on the Glasgow Building Regulations. Mr. R. W. Horn, A.R.I.B.A., who led the opening remarks, gave a summarised statement of the progress of building in Glasgow, and the consequent necessity for new laws and regulations. The first Bills passed—viz., the Police Acts of 1862 and 1866—while good in their small way, yet gave the authorities little power, and were entirely lacking in detail. This was remedied by the Bill of 1892, and will be brought nearer perfection by the new Bill of 1900, of which he showed a draft copy. After mentioning the method of preparing plans and petitions of proposed work for submitting to the Dean of Guild Court, and their subsequent revision by the Master of Works and the Guild Liners, he criticised the present regulations and the proposed new ones, giving points in which they failed, and suggestions as to remedies. A useful discussion followed, and the meeting concluded with a vote of thanks to Mr. Horn, which was heartily rendered.

People's Palace Architectural Society.—The fourth ordinary meeting of the above society was held on Saturday, Nov. 25, 1899, in room 5, Engineering department; Mr. Francis R. Taylor in the chair, 17 members present. Mr. Warrow read a paper entitled "Origin of the Arch," which was as follows:—The principles of the arch as a constructive medium for spanning openings was known by the ancient nations many centuries before the Christian era. In Egypt, India, Persia, Assyria, and Greece, there are remains of buildings and other indications that the arch was known. In all these countries it was originally used as a constructive and not an architectural feature. In the Pyramids there are two forms of spanning the openings, which undoubtedly show that the Egyptians were aware of the principle of the arch. In the ascending gallery of the King's Chamber the roof is formed by allowing every succeeding course of stone to project beyond the course below, until one large stone closes the top. The King's Chamber itself is roofed over by two stones placed at an angle to the wall, and meeting in the centre. Other examples of the arch are to be found all over Egypt, notably at the Pyramids at Thebes, which are roofed-in by brick and stone arches of semicircular construction. The next appearance of the arch was in Assyria, about the 8th century, B.C. They, however, considerably improved on the Egyptian form of arch, one of the best examples being at the city gates of Korshabad. The Greeks were not ignorant of the arch; the forms, however, were very crude and infrequent. The best examples are: the Treasury of Atreus at Mycenæ, and the gateway at Assos. It was in Tuscany that the arch began to be used, and the Etruscans were the first people who appear to understand it. The Roman period of architecture followed closely after the Tuscan, and the Romans were the first to use the arch as a decorative feature, the finest examples being the Pantheon at Rome, which has a diameter of 145ft., and is surmounted by one large dome of arch construction. From the semicircular arch of the Roman period, it was not a great step to the pointed arch, resulting in the magnificent buildings of the Gothic period. A number of lantern slides illustrative of the paper were shown. In conclusion, Mr. Tanner proposed a hearty vote of thanks to Mr. Warrow for his interesting paper, which was seconded by Mr. Ferry.

The Society of Architects. — At the first ordinary meeting of the sixteenth session of the Society of Architects, held at St. James's Hall, Piccadilly, on Thursday in last week, the the president, Mr. Walter Emden, J.P., L.C.C., in the chair, the following fifteen gentlemen were elected:—As Associate: Professor Bhise Shanker Abaji, Bombay. As Members: Messrs. E. Archer, London; J. M. Billimoria, Bombay; F. W. Chancellor, Chelmsford; J. P. Crosby, Rickmansworth, J. P. Earle, Sheffield; A. Gorton, Morecambe; D. H. Mirza, Bombay; E. C. P. Monson, London; R. B. Martin, East Ham; J. H. Martindale, Carlisle; H. W. H. Palmer, London; J. Slack, Carlisle; and A. G. Ware, Bournemouth. As student: Mr. T. Falconer, London. The President then read his opening address, which was published in our last issue, p. 683. At the close a vote of thanks was accorded to the President on the motion of Mr. Silvanus Trevail, of Truro, Vice-President, seconded by Mr. Robert Walker, of Cork, ex-President.

CHIPS.

New children's wards, which have been added to the workhouse at Brighton, were opened on Nov. 22. They have cost £15,000, and accommodate, on three floors, one hundred children. Mr. Reed was the architect, and the contractors were Messrs. J. J. G. Saunders and Sons.

On Wednesday week a fire was discovered to have broken out in the roof of the old parish church of St. Mary, Hemington, near Radstock, Somerset. The building is a specimen of Norman architecture, and the oak roof, centuries old, was partially destroyed. The walls and ancient tower with peal of bells were saved. The fire originated in a stove which was last used on the previous Sunday.

The men employed in the tunnel under Greenhow Hill, in connection with Bradford waterworks, were entertained to dinner on Saturday at Pateley Bridge to commemorate the joining of the headings. The tunnel, which is over three miles in length, has been in construction for about six years. Mr. Duncan, resident engineer, presided.

The Archbishop of Canterbury will visit the King's School, Canterbury Cathedral, on Friday, the 15th inst., when he will lay the foundation-stone of the new buildings now in course of erection just within the North Gate of the Precincts.

At a general meeting of the Society of Oil Painters, Piccadilly, held on Tuesday evening, Messrs. William Hatherall, R.I., W. H. Margetson, Herbert Marshall, R.W.S., Robert Little, R.W.S., J. Coutts Michie, A.R.S.A., and Arthur G. Bell were elected members.

Messrs. F. W. Rich, the chairman, and W. Sutton, jun., the secretary, of the Joint Committee of the Northern Architectural Association, the Newcastle, Gateshead, and District Master Builders' Associaciation, and the Council of the Newcastle Building Trades Exchange, have issued a report on the indedependent test which they were appointed in March last to organise and carry out with regard to the comparative breaking strengths of concrete slabs made with and without the addition of "expanded metal."

This (Friday) evening the Princess Louise, Marchioness of Lorne, will present certificates to the scholars of the Technical Education Board who were elected during the past year. The ceremony will take place at the Queen's Hall, Langham-place, W. It is expected that Her Royal Highness will be accompanied by the Marquis of Lorne. The chair will be taken at 8.30 p.m. by Lord Welby, Chairman of the Council, and addresses will be delivered by the Bishop of Rochester, Sir George Kekewich (Secretary of the Education Department), and Earl Carrington.

On Monday next the memorial in Chelsea of the Queen's long reign will be informally opened to the public. It consists of a gallery which has been adapted to the Central Public Library, Manresa-road, for the permanent exhibition of illustrations and memorials of this historic parish, and to be known as the Queen Victoria Gallery. The collection to be exhibited is already unique in some particulars, and is of much topographical importance. The local Jubilee commemoration fund was devoted to the acquisition of objects for the gallery, and the alterations necessary to form the gallery were carried out under the direction of Mr. J. M. Brydon, the architect of the library.

Sir Douglas Fox conducted a Board of Trade inquiry at Dover on Monday in connection with fatalities caused during the excavation of the cliffs in connection with the national harbour works. A number of witnesses were called respecting the precautions taken when blasting operations are in progress, and also with regard to the lighting of the works, which witnesses at one inquest stated were deficient. The witnesses at the present inquiry, with one exception, were of opinion that adequate precautions were taken by Messrs. Pearson, the contractors. Sir Douglas afterwards visited the works.

The large new school erected at Kittybrewster by Aberdeen School Board at a cost, including furnishing, of £12,275, was formally inspected by the members of the Board on Saturday. The Board have under consideration a scheme for building a new school on the property of the St. Clement's Land Company, at a cost estimated at about £12,065.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Situations.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. *All Situation Advertisements must be prepaid.*

Received.—J. D. Co.—B. of M.—W. H. and Co.—Perske.—I M. Co.—S. P. I. Co., Ltd.—Shareholder.—A. T.—More Commission.—The E. of D.—Rev. J. C. T.—E.—Secretary.—B. and B.—Last Chance.—C. and Co.

Harrovian.—We much prefer really good photographs of executed buildings.

Measurer.—All openings included.

Desperate.—We doubt whether there is any real remedy. We remember just such a case where a not very large gas-engine, in a solid bed of 4ft. of concrete, used to pull foundation and all about 4in. at every explosion out of the bog it was in. Piles, of course, had to be put in at last; but we really believe *they* went through to the other side!

Etiquette.—We think it was a dirty trick; but there is no such *esprit de corps* in the profession as among lawyers and doctors. You are quite helpless!

J. A.—Very expensive and risky. Much better have one of Blake's hydraulic rams. They afford the best means we know of, insuring a good water supply in country districts under such conditions.

Harry B. Spencer.—What part of Africa? Look up the colony you wish to go to in *Whitaker's Almanac*, and apply to the Agent-General in London, whose address you will find given there.

"BUILDING NEWS" DESIGNING CLUB.

THIRD LIST OF SUBJECTS.

A small town house in a square. The frontage to be 27ft., and a front area of 5ft. deep, facing west, with adjoining buildings 40ft. high to top of parapet. The street pavement line is level, and the depth of the site is 62ft., surrounded by the yards and outbuildings of adjacent premises; light only being obtainable within the area of the site. The usual conditions as to heights of the new building to be obtained, and 48ft. to be the greatest height permissible on the plane of the façade. The accommodation to comprise a good square hall and an entrance vestibule 6ft. wide. (The staircase to be 3ft. 9in. wide.) A dining-room treated as a living-room, its length to be the whole width of site. A library or own room also on ground-floor. The drawing-room to be on first floor. The kitchen and offices will be in the basement; the ground-floor level being 2ft. 4in. above the pavement. An entrance for tradespeople to be arranged in the front area, and a coal cellar may be placed under the public pavement. Six bedrooms to be provided, a bath-room, and two w.c.'s. No soil-pipes to show on the front elevation. A box-room is necessary, and a place in the basement for cycles. Roominess in style of planning is to be secured, and compactness of arrangement is of great consequence. The relative proportions and heights of the rooms are left to competitors, save where the above conditions give definite instructions. The material for the elevation is red brick with Portland stone sparingly used in a simple treatment of the Renaissance. The limit as to projections is determined by the frontage line, beyond which cornices, &c., must not overhang more than 15in. The entrance may have a projecting porch within the area limit. Scale 6ft. to the inch for elevation; sections and plans may be 12ft. to the inch. In each case the scales to be drawn on the sheet. A view optional. The section must show the staircase.

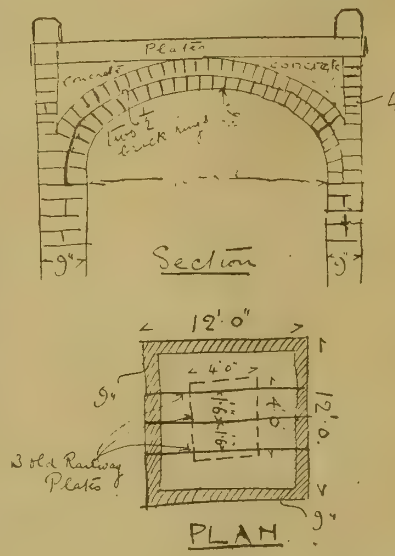
Drawings Received.—"Jové," "Go Bang," "Cedric," "Motor Car." "Hollyhurst," "Essequam Videri," "Ulmus," "Ranji." "Beetle." "Falcon," "Seymour," "Koh-i-noor," "Nothe," "Englishman."

Intercommunication.

QUESTIONS.

[11373.]—**Lead Soakers.**—I should be glad to hear the correct size of lead soakers for Countess slating, 3in. lap. Mr. Leaning, in his book on Quantities, says that anything less than 19in. in length makes bad work. Others say 12½in. is the correct length. Which is right?—F. B.

[11374.]—**Safe Load of Vault.**—What safe load would a vault carry constructed as shown in sketch? The elliptic arch has two half-brick rings; all brickwork in cement. The three old railway-plates are 1ft. 6in. apart. It is proposed to erect centrally a monument weighing about 4½ tons, having a square base with a 4ft. side.—Dead Load.



[11375.]—**Steel Chimney Construction.**—Will anyone conversant with the construction of steel chimneys give me particulars of their construction, and where I can see one? I am told they are largely erected in the United States, and are cheaper than brick. What I should like to ascertain is the proportionate cost of chimneys in brick and steel, the thickness of steel plates, how fixed, lined, &c.?—Factory.

[11376.]—**Lead Cupola.**—Are the sheets for a cupola of curved outline laid on the boarding and secured by copper nails? Also, will a lap at the joints of 4in. be enough? I suppose the corners must have rolls. I want to avoid soldering as much as possible. Shall be glad of any explanation or hints.—Young Designer.

REPLIES.

[11371.]—**Stable Paving.**—There are several kinds of stable paving. I should say the channelled granite concrete paving supplied by Ward and Co., of Great George-street, would be clean and durable. The St. Pancras Ironwork Co. have a capital paving block. Obtain their catalogue and select for yourself.—G. H. G.

[11371.]—**Stable Paving.**—Each has many merits. Perhaps bevel-edge blue bricks are least slippery—grooved ones, I mean, although granolithic can no doubt be grooved.—Regent's Park.

[11372.]—**Gas-Pipe Channels in Floors.**—Pipes of fireclay may be let into the concrete, or grooves may be made in the concrete for the purpose. I should prefer the pipes placed below the concrete or along the flange of girders if they project below.—Builder.

[11376.]—**The Quick and Dead Fence.**—It is usual to allow in the case of a fence growing on a bank 4ft. from the centre of edge, but the rule in some districts is different. The theory of the distance to be allowed from the hedge is that the owner of the fence has dug the ditch on his own land and thrown up the bank so that the rear boundary is the outer edge of the ditch; but I should advise "Hampshire" to ascertain the rule in the district as the distance assumed varies. He is quite right, therefore, in thinking that the old law required any person fencing with quick to plant the sets so many feet within his own boundary, especially when there is a ditch on one side.—A. S.

LEGAL INTELLIGENCE.

Compensation Claim from Rotherhithe.—Mr. Under-Sheriff Burchell and a special jury at Red Lion-square, Holborn, on Thursday heard the case of "Kimber and Son v. the South-Eastern and Chatham Railway Companies," a claim for compensation in respect of the freehold interest in an iron foundry and yard in Debnam's-road, Rotherhithe. The claimants bought the property in question at the Mart in November, 1896, for £350, and had since let it on a quarterly tenancy for £41 5s. per annum. The railway company now required the premises for their widening to New Cross. The superficial area of the property was 3,420ft., and the estimated value £60 a year, which the experts engaged in the case valued at 20 years' purchase, £1,200. They deducted from that £200 to put the premises into good repair, leaving £1,000, to which they added the customary 10 per cent. for compulsory sale, and a sum of £300 as a solatium for removal, making a total claim of £1,400. Mr. James Field (past president of the Auctioneers' Institute), Mr. Douglas Young, and Mr. J. H. Bulmer gave evidence for the claimants. On behalf of the railway companies, Mr. Boyle said that Mr. A. L. Ryde, Mr. Leslie Vigers, Mr. Pierson, and Mr. George Humphreys Davies were present to give valuations; but he would not call them, as the best evidence was the price paid for the property in 1896 in the open market and under the hammer. The jury, having viewed the property, awarded the claimants £720, including the 10 per cent. for compulsory sale.

Open Spaces behind Houses in Scottish Burghs.—A case of interest to proprietors of property, to architects and builders, in Scottish towns was decided in the Dean of Guild Court at Ayr last week. The petition before the Court was on behalf of Mr. Wm. Kay, who had feued a piece of ground in Dalblair-road on which he proposed to erect a three-story tenement containing six houses of three rooms and kitchen, and the burgh surveyor opposed the application to erect such a building on the ground that it would not be sufficiently ventilated and lighted in terms of the Burgh Police Act, 1892, section 170. It seems that the free space inclosed behind the building proposed to be erected was a little less than three-fourths of the space occupied by the main buildings, and the burgh surveyor's argument was that any person proposing to erect a building to be occupied as a dwelling-house must be the exclusive proprietor of at least three-fourths of the space behind the building proposed to be erected. Mr. O'Beirne, solicitor, who appeared for the petitioner, after quoting two decisions of the Scottish Court of Session against the surveyor's views, pointed out that the practical result of adopting such a view would be that a great deal of the property in that burgh, if it became ruinous or was burnt and had to be re-erected, could not possibly be re-erected. The surveyor's interpretation of the section he contended was altogether wrong, and would not be practicable in this burgh. The Town Clerk advised the Court that the surveyor was right, and that there was a Court of Session decision in favour of his view. The Court, notwithstanding, unanimously granted the lining.

Continuity of Employment in Workmen's Compensation Cases.—In the Court of Appeal on Friday, Lords Justices A. L. Smith, Collins, and Vaughan Williams heard the case of Hewlett v. Hepburn and Co., a masters' appeal from a decision of the County-court Judge of Dartford, awarding the applicant, under the Workmen's Compensation Act, 17s. 9d. a week compensation during incapacity. Mr. Hohler, for the masters, said on August 24, 1897, Hewlett, who was a carpenter-joiner, was first employed by the appellants, and he was at constant work for them until February 17, 1898. During that time his wages varied very slightly; but from that date until May 12 in the same year, a period of eleven weeks, he was away ill, and neither asked for nor was paid wages. He then came back and resumed his old employment, continuing at work until August 18, when he was again ill and absent on sick-leave, not returning to work until December 3. In February, 1899, he met with the accident which resulted in the loss of two of the fingers of his left hand. The masters, when claim for compensation was made, said they were prepared to allow him 12s. 9d. a week, which the amount of his earnings for the year worked out at, if his employment with them was to be treated as continuous during the twelve months preceding the accident, and his absence through illness for the eleven weeks was only a "rest" on the payment of his wages, and not a "break" of his contract of service with them. On the evidence given the learned County-court Judge thought that the eleven weeks' illness ended his previous engagement of service, although no notice to leave had been given Hewlett, and therefore he awarded him 50 per cent. of the average weekly earnings he had made between May 12, 1898, and February, 1899, which raised the compensation to 17s. 9d. Counsel cited "Jones v. Ocean Coal Co." and "Appleby v. Horsely Co." Mr. Tassell, for the workman, said the question of whether Hewlett went to work for the appellants again in May, 1898, under the old agreement of service or under a fresh contract, was a question of fact. The learned Judge had decided it in his favour, and there was no appeal on a question of fact. Lord Justice A. L Smith said he had often stated since appeals under the Act came to that Court, that the Legislature had made the Judge of the County-court the final tribunal on all questions of fact. He had held in this case that the contract of service had not been continuous for the twelve months preceding the accident. That was the only issue raised by the parties, and it was one simply of fact. The masters' appeal failed. The other Lords Justices concurred, and the appeal was dismissed.

STATUES, MEMORIALS, &c.

The Gladstone Memorial in London.—The Improvements Committee reported to the London County Council on Tuesday, on a letter from the Gladstone Memorial Committee, expressing a desire to secure an appropriate site for the monument which they propose to erect in London to the memory of Mr. Gladstone. The Improvements Committee stated that the memorial, as designed by Mr. Hamo Thornycroft, R.A., consists of a structure of cruciform shape at the base, measuring about 26ft. every way, with a pavement round it about 6ft. wide. The superficial area of the ground required for the structure will be about 500ft., or, including the pavement, about 1,100ft. It is proposed that the memorial shall have an architectural basement of Portland stone, and shall be surmounted in the centre by a bronze statue of Mr. Gladstone in the robes of the Chancellor of the Exchequer. Seated statues or groups, also in bronze, will be placed on the projecting portions of the basement, and the total height of the memorial will be about 32ft. The committee recommended that the Council should give the memorial committee the option of selecting one of the following sites:—(1) The site at the junction of the new main street with the crescent; (2) the site immediately to the west of St. Clement Dane's Church; (3) that immediately to the west of the church of St. Mary-le-Strand. The report concluded with a definite recommendation to the Council to offer one of the three sites on the conditions mentioned.

CHIPS.

On St. Cecilia's Day, the new organ at Worlingworth was inaugurated by the Bishop of Ipswich. The instrument had been supplied by Messrs. Norman and Beard, of Norwich, at a cost of nearly £300.

Mr. William H. Hume, head of the architectural firm of William H. Hume and Son, New York, died in that city on November 11, from pneumonia. He was the designer of large office buildings, the Colonial Club, New Netherlands Hotel, Scotch Presbyterian Church, and other well-known structures in New York, and was also connected with a number of successful financial organisations.

The Bishop of Wakefield announced the other day that £17,500 had been raised towards the cost of enlarging the cathedral as a memorial to the late Bishop Walsham How. He trusted that during the coming six months they would raise the £7,500 required to secure the promised gift of £2,500 by a member of the Cathedral Enlargement Committee. He did not think there was the least fear that they would fail to win the gift.

The new organ on the screen of Norwich Cathedral, built by Messrs. Norman and Beard, of the same city, at a cost of £6,500, will be opened on Saturday in next week the 9th inst. The works include new flooring for the organ loft, and a new oak roof for the ante-choir.

The new St. George's Hall and Schools which the Primitive Methodists have built in Old Kent-road, London, at a cost of £12,000, as the headquarters of their South-East London mission, will be opened on Jan. 4 next.

A much-desired improvement has recently been made in the Money-order Office of the General Post Office, Edinburgh. The dilapidated old round top counter has been removed, and a new flat counter to accommodate additional clerks put in its place, each clerk being provided with additional cash accommodation, and also inclosed by a screen for protection. The design was by Mr. G. L. Davis, clerk of works, H.M. Office of Works, Edinburgh.

We learn that the markets committee of the Salford Corporation have decided not to proceed with the scheme for ice making and cold storage. The deputy engineer in his report, which was considered by the committee at their meeting last week, was not able to recommend the committee to proceed with the scheme, in view of the great local competition both for ice making and cold storage, and the unfavourable financial results in other towns. After full consideration the committee decided to abandon the scheme, and to withdraw the clauses from the Bill now in preparation for the next session of Parliament.

Our Office Table.

The Improvements Committee of the London County Council reported on Tuesday that nearly all the property fronting the Strand between St. Clement Danes Church and St. Mary-le-Strand Church, and needed for the widening of the Strand, has now been acquired, and they have arranged for the immediate acquisition of the remaining property. They point out that it may not be possible or expedient for some time hence to remove entirely the whole block of buildings lying to the south of Holywell-street, but they can at once arrange for the widening of the Strand to 70ft., which will be a great convenience for the traffic in this part of the Strand. A large hoarding or some inexpensive lattice work will be erected on the north side until the remaining portion of the improvement, involving the demolition of the houses in Holywell-street, can be executed. The committee have given the necessary instructions for pulling down the houses forming the northern frontage of the Strand, and they hope that the paving works will be completed by next March.

The Housing of the Working Classes Committee of the London County Council have prepared a scheme, for the erection of a large "poor man's hotel" on the lines of those already erected by Lord Rowton. In 1895 the Mill-lane area in Deptford was cleared under a scheme under the Housing of the Working Classes Act. By the scheme it was provided that new houses for the accommodation of 550 persons should be erected on the area in place of the houses destroyed, which were occupied by 715 persons. Various difficulties have since arisen with regard to the rehousing, and up to the present nothing has been done. The troubles seem to have chiefly been to find accommodation for the 550 persons required under the scheme. The architect to the Council has now prepared a plan for a men's lodging-house similar to those already erected by Lord Rowton. The area is triangular in shape, and the plan shows that a building of this kind could be erected on the deeper portion of the area to provide accommodation for 670 persons. The shallower portion of the area would still be left, and upon that cottage dwellings can be erected. In their report recommending the Council to sanction the building of this house, the committee stated that they had obtained the approval of the Local Government Board to this plan, but before bringing the matter before the Council they communicated with Lord Rowton and Sir Richard Farrant, who had generously intimated their willingness to place their unique knowledge and experience at the service of the committee. As the result of an interview with these gentlemen, they were convinced that the site was an exceedingly suitable one for the erection of such a house. Both Lord Rowton and Sir Richard Farrant emphatically stated that in order to make the house a success it was essential that it should contain all the comforts and improvements which were the characteristics of a Rowton House, while the architect had informed them that these could only be provided by making a charge of 6d. per bed per night. This report was submitted to the Council on Tuesday, and led to a long discussion, chiefly on the sum to be charged for accommodation. An amendment that the charge should not exceed 5d. per bed per night was rejected by 54 to 35 votes, and the debate was then adjourned.

In consequence of some sensational statements made a short time ago with reference to the dangerous condition of the iron girders beneath the floor of a section of the Smithfield Markets, the Central Markets Committee were instructed to consider whether there was any ground for the rumours, and also whether the Metropolitan Railway Company, whose line runs beneath the market, was not bound to keep the girders in substantial repair. The committee, in a report which has just been issued, state that the lessees of the space underneath the market are bound to keep all walls, piers, and supports in good repair. The Metropolitan Railway Company have taken steps to brick round all pillars and form arches of brickwork beneath the girders. The City surveyor (Mr. A. Murray) states that the girders carrying Lindsey-street have been seriously affected by the action of steam, which, with smoke and sulphurous vapours, clings to the ironwork, so that in a very short time no doubt the girders might become dangerous. The railway company are casing the ironwork with concrete, and the whole will be carried upon new brick and concrete construction, which is practically indestructible. In the City surveyor's opinion the railway company are taking the best steps possible for insuring the future stability of the structure at considerable expense.

Parliamentary sanction will be sought next session for another railway tunnel under the Thames. The suggested situation is below Erith, the promoters of the Purfleet and Gravesend Junction Railway proposing to connect the London, Tilbury, and Southend and the South-Eastern systems with a line which, starting in the parish of Wennington from a junction with the former between Rainham and Purfleet stations, would pass under the Thames and join the North Kent line of the latter in the parish of Stone, between Dartford and Greenhithe stations. They desire to be authorised to use the Tilbury line between the point of junction and Rainham Station, and similarly the South-Eastern as far as Gravesend station, which they propose to join the South-Eastern in enlarging and improving.

A movement, supported by a strong general committee, of which Professor H. F. Pelham is chairman, is in progress for the establishment at Rome of a British School, similar to that which has existed for thirteen years at Athens. Germany, France, Austria, and the United States already possess institutions of the kind in Rome. The formation of such a centre would be welcomed by the committee of the Athens school as a means of enabling students to complete in Rome the training they have received in Athens, though the work done in both cities would be of similar character. The school in Rome, like that in Athens, would be a training ground for students fresh from the universities or other institutions, as well as a place where more mature students could gather, to the stimulation of intercourse and sympathy, and the achievement of more concerted and continuous work. The school would also be useful to visitors, and it could also be made effective in organising work in Naples, Florence, Venice, and elsewhere in Italy. It is felt to be very desirable that the schools of Athens and Rome should be intimately connected, and, if possible, managed by one committee. It is thought that the immediate control of the school should be vested in a director of a standing and attainments which would enable him to hold his own with the heads of other foreign schools, and that a house or flat should be secured, where there would at least be a library and reading-room, and probably apartments for the principal. Taking all the needs at present seen, and others which will disclose themselves, several thousands of pounds will have to be spent to begin with, and an income of a thousand a year will be required.

The excavations on the site of the Forum at Rome continue to be successfully prosecuted. In the afternoon of Friday last two of the workmen engaged in the search for antiquities laid open a sewer, dating from the days of Nero, and passing under the outer inclosure of the house of the Vestal Virgins. Suddenly they turned up a quantity of gold coins imbedded in the sediment of the sewer. They filled a hat with these coins, which proved to be gold pieces of the fourth and fifth centuries. The coins were probably thrown where they were found for concealment at the time of an incursion of the barbarians, their owners not having an opportunity of recovering them. They are all well preserved, and many of them were evidently fresh from the mint. They are 379 in number, and belong to seven distinct reigns.

At the Whitworth Institute, Manchester, on Friday night, Mr. Whitworth Wallis, of Birmingham, delivered the first of a series of three lectures on "Pompeii, the City of the Dead." Mr. Wallis said it was thought for a long time that the irruption which destroyed the Roman city occurred in the month of August; but recent discoveries of fruit and other things made it clear that November was the month. The buried city remained undisturbed till the 16th century, and it was not till 1863 that systematic excavation began. He explained how the clearing was done, and put on the screen some photographs of work in progress. The usual depth they had to dig down was from 15ft. to 20ft. A number of cleared streets were shown: these, as a rule, were very narrow, the widest not being more than 36ft., including the side paths. The water supply must have been excellent, judging by the extraordinary number of fountains, not only in the streets, but in the houses. It was the habit then, as now, to "decorate" the walls with advertisements. Specimens of these were shown on the screen, and translated, including the following:—"The stables and outbuildings are to let; apply to the Major-domo." "Here are hot and cold sea-baths." "Stolen, a fine bronze urn; whoever brings it back will receive 15 cisterci." A number of the advertisements referred to candidates standing for posts in the municipality. The street signs were also very interesting, and some of them are in use at the present day. It was possible in Pompeii 2,000 years ago to call at "The Chequers." Mr. Wallis next showed the interiors of some of the houses, giving details of their domestic arrangements, gardens, fountains, and decorations. He also put on the screen photographs of some of the public baths. In his second lecture, to be delivered this (Friday) evening, Mr. Wallis will deal with the theatres, temples, and great public buildings of the old city.

THE purchase of the Muckross Estate, including a large portion of the Lakes of Killarney, by Lord Ardilaun, promises to preserve that beautiful district for the enjoyment of the public. Lord and Lady Ardilaun will not reside at Muckross. He intends to let the house, but he has no present intention of curtailing the privileges enjoyed by the public. The tariffs will be rearranged on a more equitable basis, and some alterations may doubtless be made in the estate. Some new buildings may be erected, but these will not, it is promised, in any way interfere with the sights hitherto opened to the public. Lord Ardilaun does not desire this to be regarded as a pledge for the continuance of the privileges, but merely as a reflection of his present intention.

A DIFFICULTY has arisen in connection with the scheme for building a new Masonic Hall on the south side of Great George-street, Leeds. Plans for the structure, upon which (apart from the land) it is intended to spend about £6,000, were recently adopted, and everything is ready for commencing building operations. Before a single spadeful of soil has been turned, however, an unforeseen obstacle has presented itself. The Leeds City Council at their last meeting sanctioned an important project for widening and straightening Cookridge-street, the carrying out of that plan involving the purchase and demolition of the Roman Catholic cathedral, schools, and presbytery. It is proposed by the corporation to schedule land 84 yards back from Cookridge-street, the area thus affected comprising 14,625 yards between Great George-street and Guildford-street. The ear-marked land includes the new Masonic Hall site, containing about 650 square yards, which, it is understood, the improvements committee intend to offer to the Roman Catholic authorities in substitution for the site now occupied by St. Ann's Cathedral and adjoining buildings. The Masonic fraternity are taking vigorous steps to prevent the acquisition of their site by Roman Catholics, and a resolution on the subject will be moved at the next meeting of the city council.

CHIPS.

The tramways committee of the Liverpool Corporation have considered a report of the city engineer, Mr. J. A. Brodie, concerning the reconstruction of existing lines of trams and the construction of new lines for electric traction. The estimated outlay is £350,000. The report has been adopted.

On Wednesday week the Bishop of Winchester dedicated the new church of St. Stephen's, Portsea. It is Free Perpendicular in style, and will seat some 700 people. It has cost £7,000. The honorary architect is Mr. R. A. Crowley.

At St. Annes, Lancs, on Friday, Colonel Durnford held a public inquiry into the application of the St. Annes Council to borrow £18,000 for electric lighting. No opposition was offered.

Mrs. Carson, widow of the late Mr. Edward Henry Carson, architect, of Harcourt-street, Dublin, and mother of the Right Hon. E. H. Carson, Q.C., died on November 23rd, at Pembroke-road, Dublin.

Services and a public meeting for the reopening of Oldfield Park Wesleyan Chapel, Bath, were held on Friday. This chapel was erected in 1893, at a cost of £2,249, and now by enlargement, at a cost of £1,155, additional accommodation for 158 persons and 178 children in the Sunday-school has been provided.

MEETINGS FOR THE ENSUING WEEK.

MONDAY.—Royal Institute of British Architects. Business Meeting. 8 p.m.

Society of Arts. "Art Enamelling upon Metals," Cantor Lecture No. 3, by H. Hardinge Cunynghame. 8 p.m.

Leeds and Yorkshire Architectural Society. "Building Conditions in the East," by Beresford Pite, F.R.I.B.A. 6.30 p.m.

Liverpool Architectural Society. "Ceilings," by L. A. Shruffrey. 6. p.m.

TUESDAY.—Institution of Civil Engineers. Discussion on "The Waterloo and City Railway, and its Equipment." 8 p.m.

Architectural Association of Ireland. "Difficult Foundations and Substructures," by H. Norman Leask. Grosvenor Hotel, Dublin. 8 p.m.

WEDNESDAY.—Royal Archæological Institute. 4 p.m.

Society of Arts. "Artificial Silk," by Joseph Cash. 8 p.m.

Edinburgh Architectural Society. "Notes on Art," by W. M. Page. 8 p.m.

Royal Archæological Institute of Great Britain and Ireland. 1. "Notes on Lacock Abbey Church," by Harold Brakspear. 2. "Roman Suffolk," by George E. Fox, Hon. M.A.Oxon, F.S.A. 20, Hanover-square, W. 4 p.m.

FRIDAY.—A.A. Lyric Club Cinderella Dance, King's Hall, Holborn Restaurant. 7.30 p.m.

Birmingham Architectural Association. "The Co-operative System among the Medieval Builders in England," by C. R. Ashbee. 6.45 p.m.

Glasgow Architectural Craftsmen's Society. "Graphic Calculations," by D. Bennet Dobson. 8 p.m.

Trade News.

WAGES MOVEMENTS.

ABERDEEN.—A joint meeting of the monumental and building branches of the Aberdeen Masons' and Granite Cutters' Union was held on Nov. 22nd in the Trades Hall—Mr. John Anderson, president, in the chair—for the purpose of considering the giving of assistance to the members of the union at present out of employment, numbering about 200. It was reported by the secretary, Mr. George Younie, that there was plenty of work in the South, and it was agreed to pay the railway fares of those members who intended going to England or elsewhere in the kingdom in search of employment.

BRADFORD.—The Bradford branch of the National Union of Operative Plasterers have served the Bradford Master Plasterers' Association with a demand for an increase of wages from 8½d. an hour to 10d. an hour, the advance to take effect from the beginning of next January. Several conferences have been held, but so far there appears to be no prospect of a settlement, and it is stated that the men intend to press for the full amount. The builders' labourers are also asking for an increase from 6d. to 7d. an hour, and the joiners have given six months' notice of a demand for an increase from 8½d. to 9½d. an hour. The schemes on foot include the erection of the Cartwright Memorial Hall, central and district baths, market extensions, electricity works extensions, town hall extensions, workmen's dwellings, a new central fire brigade station, a new board school, and other large undertakings, besides the ordinary building operations of the city.

CHESHIRE. — The builders in a number of the Cheshire centres have advanced the wages of the joiners in their employ to 8d. an hour.

TRURO.—An agitation by the masons employed on the extension of the cathedral has been amicably settled by a partial concession of the men's demands, and the threatened strike, with its attendant delay and loss, has been averted. The granite masons, who are members of the Stonemasons' Union, applied for an advance of 1d. an hour on their present wages of 7d. an hour. A meeting of the men and representatives of the contractors, Messrs. Willcock and Co., Wolverhampton, was held, when the masters offered an advance of ½d. an hour, and this offer was accepted.

St. Fetticks, a new church erected at Torry, Aberdeen, in connection with the Church of Scotland extension scheme, was formally opened for worship on Sunday. St. Fetticks has been completed at a cost of £2,000.

The new Leather Industries Buildings, in connection with the Yorkshire College, Leeds, which have been erected by the Skinners' Company at a cost of £5,000, were opened on Monday by the Master of the Guild.

The Bradford School Board have adopted plans by Mr. A. Priestman for the erection of new schools, in four departments, for 1,540 children. The estimated cost, including the provision of gymnasium, swimming-bath, and twelve slipper-baths, is £20,000.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	,,	9 0 0
Wrought-Iron Girder Plates	8 15 0	,,	9 15 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£14 10 0	...	£15 0 0
Best ditto	15 0 0	...	15 5 0

	Per ton.		Per ton.
Cast-Iron Columns	£9 0 0	to	£9 15 0
Cast-Iron Stanchions	9 0 0	,,	9 15 0
Rolled-Iron Fencing Wire	8 5 0	,,	9 5 0
Rolled-Steel Fencing Wire	8 5 0	,,	9 5 0
,, ,, ,, Galvanised.	12 0 0	,,	13 0 0
Cast-Iron Sash Weights	5 17 6	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
10/-	10/6	11/-	11/9	12/6	13/6	14/6	16/3	18/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	106s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	62½ p.c.
Water-Tubes	57½ ,,
Steam-Tubes	56½ ,,
Galvanised Gas-Tubes	50 ,,
Galvanised Water-Tubes	45 ,,
Galvanised Steam-Tubes	40 ,,

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£33 0 0	to	£34 0 0
Do., Vieille Montagne	34 10 0	,,	35 15 0
Sheet Lead, 3lb. per sq. ft. super.	20 0 0	,,	20 5 0
Pig Lead, in 1cwt. pigs	17 0 0	,,	17 10 0
Lead Shot, in 28lb. bags	20 10 0	,,	21 10 0
Copper Sheets, sheathing and rods	95 15 0	,,	93 0 0
Copper, British Cake and Ingot	79 0 0	,,	80 0 0
Tin, Straits	128 0 0	,,	129 0 0
Do., English Ingots	133 0 0	,,	134 0 0
Spelter, Silesian	20 12 6	,,	20 15 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 0 0	,,	15 10 0
Quebec Pine, yellow	,, ...	5 5 0	,,	7 0 0
,, Oak	,, ...	4 10 0	,,	6 10 0
,, Birch	,, ...	2 15 0	,,	4 15 0
,, Elm	,, ...	5 0 0	,,	5 10 0
,, Ash	,, ...	4 5 0	,,	5 0 0
Dantsic and Memel Oak	,, ...	2 10 0	,,	4 10 0
Fir	,, ...	3 0 0	,,	4 0 0
Wainscot, Riga p. log	,, ...	3 10 0	,,	5 15 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 8	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£20 0 0	to	£27 0 0
,, 2nd	15 0 0	,,	17 10 0
,, 3rd	9 0 0	,,	11 0 0
Canada Spruce, 1st	9 0 0	,,	11 10 0
,, 2nd and 3rd	7 10 0	,,	9 0 0
New Brunswick	7 0 0	,,	8 10 0
Riga	9 0 0	,,	10 0 0
St. Petersburg	10 10 0	,,	17 0 0
Swedish	10 10 0	,,	17 10 0
Finland	9 10 0	,,	11 0 0
White Sea	12 5 0	,,	18 5 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 10 0	,,	£0 15 0
2nd ditto	0 9 0	,,	0 11 0
Other qualities	0 4 0	,,	0 9 6
Staves, per standard M :—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£21 12 6	to	£21 15 0
Rapeseed, English pale	,, ...	23 15 0	,,	24 0 0
Do., brown	,, ...	22 5 0	,,	22 10 0
Cottonseed, refined	,, ...	17 15 0	,,	19 0 0
Olive, Spanish	,, ...	34 10 0	,,	35 5 0
Seal, pale	,, ...	20 0 0	,,	21 0 0
Cocoanut, Cochin	,, ...	29 10 0	,,	29 15 0
Do., Ceylon	,, ...	25 0 0	,,	25 5 0
Palm, Lagos	,, ...	25 10 0	,,	23 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 0	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

THE BUILDING NEWS
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CONCEALING STRUCTURE AND OVERLAPPING.

ONE of the characteristics of our modern architecture in a practical aspect is the obscuring of the structural by the ornamental. The structural and the finished result are not the same. In all our modern buildings this dual intention—this double meaning—is latent, and the practice of the modern architect is so based on this separation of the two things that there is a danger of the work becoming untruthful and insincere. What we see is often not the structure, but the facing or encasement. The real structure is hidden. It may be behind a shell of stone or brick work, or a façade, if there is only one side visible. The inner building or structure may be the work of the constructional engineer or builder; the encasement only that which the architect is chiefly concerned about. There are one or two aspects of this matter that concerns not only the architect, but the prospects of his art. No doubt the custom we are speaking about has its commercial side as well as the art side. Our building operations have to be carried on at a pace. The architect has little time to think—it must be put in hand at once; it is a large shop or warehouse, perhaps, that must be finished for business by a certain date. The walls and floors must be "run up," the structural must precede the architectural. The plan of walls and stanchions being settled, the work is put at once into the hands of the structural engineer. There is no question as to the proper form or section of the iron supports, or their external design, as they will be all covered up, and no one will see them. They may be of the stock patterns and sizes to bear certain loads. It is a rough-and-ready mode of building; the structural skeleton is erected first, and any determinations of form and of artistic proportions are thought of afterwards. The method saves time; all preliminary studies of the proper adaptation of iron or brickwork are left to the other materials which form the clothing of the skeleton. If the columns and girders want substance and more agreeable proportions, it can be done in casings of plaster or of woodwork. Time is saved at the cost of architectural study. How very different to the methods that were adopted in the best periods. There was no clothing or overlapping in the after trades. The designer shaped his materials at the beginning to their ultimate sizes and proportions; there was no brick or iron core clothed with other materials. Each was designed to bear the weight and become visible supports in the design. There was, in short, no structural skeleton other than that which was visible, and became part of the design. We wonder sometimes how the modern builder would have set to work in building any cathedral in our day had it not been for the precedents left to him. Probably he would have erected a steel skeleton of piers and arches to form the nave, and then incased these in brick or with some moulded material, like terracotta; the vault overhead would have been of concrete and steel, and iron ties would have been used, instead of massive buttresses outside to counteract the thrust. He could never have resisted the temptation to have erected a rough skeleton or framework first, and then to cover them over by architectural forms afterwards in cheap plastic materials. Never having known the necessity of building structures with stone in masses so constructed as to produce a pleasing equilibrium, it would have been almost impossible for him to shape his material at the beginning. The Mediæval architect developed, so to speak, his structure outwards; it became really the motive and visible design; when he pierced his barrel vault, by cross vaults, he developed at once a beautiful roof and system of piers and counterforts at once perfect as an equilibriated structure, light and graceful in design; when he further sought to overcome the difficulty of preserving a level-ridge rib, the result was the introduction of the pointed arch and the beauty of groined ribs; each requirement of vaulting modified the plan. On the other hand, the modern system is to leave the structure as merely a rough framework, not to develop it outwards, but to hide it. It seems impossible under this system to develop structural form to make it visibly express the design. Being concealed or buried beneath other materials, it has a separate existence apart from the design. The architect has no more to do with it; but he spends his time in designing a covering for it that may be quite independent, and often ignores its existence. All our modern buildings being designed more or less on this principle of clothing or covering up, development seems to be impossible. The architect of to-day is an expert at applying design—that is, design that once depended on structure, and was developed from it—to skeleton structures, to brick carcases. He is clever at applying, for example, a Gothic or Renaissance dress to any building for any purpose, and this is, as we have said, just contrariwise to that which was formerly practised.

But, to dwell on a few consequences of this system. One of the most patent is that it encourages concealment and abets the dealer in makeshifts and bad building. So long as the structure was made prominent, there was a direct encouragement to build substantially and well. Old stone and brick walls were a credit to the mason and bricklayer; but it is very different now. When once we conceal our structure, there is a tendency to lose sight of it and make it subordinate. The stuccoist of a few decades ago was an expert in the art of concealment, and he soon became an expert in shams also. We just remember how brick walls were built in the forties; the bricks used were often unburnt "shuffs," or bad "place" bricks, the joints were wide and the courses uneven, and the poorest mortar was used. The most costly stucco fronts arose in Brighton and other places on rotten cores; cheap stone-faced walls were little better. There was not the slightest correspondence between the facings of stucco and stone and the brick backings—one grossly belied the other. Other trades shared in this apostacy. An honest expression of the real material was nowhere to be found. Plasterers were great sinners; huge cornices and impossible pilasters and projections were made without the slightest warrant, by "dubbing" out and other artifices. This construction of decoration has led to all kinds of sham. By obliterating structure or disguising it, it was easy to descend to dishonesties, and deceptions arose in every trade. Such was the jointing of stucco to imitate stone courses and voussoirs, the concealment of timber construction, and the deceptions of the painter and grainer. But we have our deceptions now. We see the same evil of overlaying and misrepresenting the actual structure, the supporting framework of our buildings, as if they existed not. They are perhaps less offensive than sham stucco; but we have these deceptions just the same. Look at any of our large shop premises! They exhibit no evidence of how the upper stories are carried; if there are iron columns they are buried up within the shop front, or are incased in woodwork or slabs of polished marble to represent ornamental piers or columns. With this falsification on the ground story, it is no wonder that the façade over has no reference whatever to it; it is of stone or brick and terracotta, embellished by columns and pilaster entablatures, or else a copy of a Renaissance façade. The structure behind it is an iron or steel framework of stanchions and girders and fireproof floors, but having no reference whatever to the front. It finds no expression; even the heights of floors are not emphasised in the elevation. This is a typical modern building. All the art we can discover is in the careful imitation and details of the external case, in the skill with which everything constructive has been obscured or falsified. The non-expression of the internal arrangements is, of course, complete, the result of not making the real construction the incentive and motive of the design.

There is another evil that comes from this, against which the architect ought to be on his guard. It is the overlapping of the trades which follow as a consequence. When structure and architecture were one and the same, and material really influenced architecture, every material visibly took up its share; but when it became covered up and hidden, this was no longer the case; other materials were employed, and with them other trades. We take one example out of many that may be mentioned—the incasement of iron construction. Instead of the iron playing its part boldly, it is incased in slabs of marble or polished granite. The marble mason has to try and do what the ironworker has done before him, or, rather, to clothe with marble the iron. In a similar manner the naked iron girder is incased with slabs of decorative plaster, or clothed in wood and plaster: the trades of the carpenter and joiner, plasterer and decorator have to go over the same work. Even the breastsummer of wood, or the rolled iron girder which carries the front over a shop, employs several trades. The joiner has to bracket it out to form a cornice and fascia and a casing for the revolving shutters, all kinds of fillets and wood-framing have to be fixed to the iron for the plasterer; or the mason or marble-worker is employed to incase it, to say nothing of other trades engaged in painting and decoration. Can we wonder that so little sympathy is seen between these several crafts in the finished work; that so much labour is thrown away to such little purpose; that, instead of the ironworker making his girder large enough and sightly with appropriate modes of treating the iron, others have to be called in to undo or modify the design, to make it shapely or deep enough, or ornamental enough. And this is only a sample of what goes on in furnishing a large building. How many different trades are engaged in the incasing of fireproof floors, of beams; the decorative plasterer is responsible for a good deal of the incasing. The system of overlapping is thoroughly a modern device, or rather the consequence of concealing structure. It has created a number of trades which live and flourish, not only those connected with patent plaster, but veneers of all kinds, workers in pottery, and metal, and wood. Each of these crafts has perfected his art. We have now tiles made, and terracotta and fireclay slabs, for every kind of incasement, many of them ingenious and well adapted, and then we have beautiful parquetry and wood blocks arranged with consummate mechanical art and taste. May it not be that the monolithic and homogeneous systems of construction are giving place to composite modes of building? We have yet much to learn as to the possible methods by which these trades can be employed to give expression to structure; but in the mean time we have to consider the evils of obscuring what is really honest and constructional, and separating building from architecture.

PARTY-WALLS AND STRUCTURES.

THE valuable paper read by Mr. P. E. Pilditch on "Party-Walls Under the 1894 Building Act" at the Surveyors' Institution will serve to explain a rather complicated subject, if not remove certain difficulties. The definition of party-wall has been long a question of difficulty. The sub-sections of the new Act have to some extent cleared the interpretation, and extended its application to other walls than those first contemplated —namely, those "forming part of a building and standing to a greater extent than the projection of the footings on lands of different owners" (see sub-section 16 in Act for 1894) —and this has been a gain. As Mr. Pilditch remarked, under the old Act, if a person wanted to know if a wall was or was not a party-wall under the Act, he had simply to inquire if it stood between two existing buildings with a view to separate occupancy; but if a wall built against on only *one* side, the question of ownership had to be inquired into, to ascertain whether it was a party-wall or not. The definition of "party-structures" is also altered, so that it would now appear that approach by distinct staircases or entrances is essential—not mere separate ownership. In other words, under the present Act, separate ownership, if unaccompanied by distinct staircases or entrances from without, does not render a floor separating horizontally the two parties a party-structure. This is an important difference between the Acts of 1855 and 1894. The old Act included party-walls, partitions, and floors separating rooms which belong to different owners, as well as those approached by different staircases, &c.; but the present Act leaves the separate ownership out altogether, and defines a party-structure as a wall or floor approached by distinct staircases or separate entrances.

The question as to who is the "adjoining owner" is also one upon which there has been considerable disagreement, and the difference between the definition in the old Act and the new Act is noteworthy and far-reaching. According to the latter it means "the owner, or one of the owners" and the "adjoining occupier" means the occupier or "one of the occupiers of land, buildings, stories, or rooms adjoining those of building owner." It has been argued that the term "one of the owners" is intended to relieve the building owner of the onus of serving all the various owners interested with notices, provided one of them was served, as it would be often difficult to find all the persons interested. On the other hand, it was urged that these "words were intended to accentuate the necessity of giving each one of such owners by statute the notice they previously had by case law." The question has a significant bearing on the holders of tenancies or underlessees of portions of premises. In one case it was, moreover, held that the word "owner" in sect. 5, sub-sections 29, 32, &c., included a person who had entered upon land and erected buildings under an agreement for a lease, although the agreement was expressed not to operate as a demise, but to give only a right to enter on the premises for the purpose of performing the agreement. A person in that position was entitled, as an "adjoining owner," to receive from the adjacent building owner the notice and particulars of proposed work required by section 90. But we refer our readers to the remarks of Mr. Pilditch under this section.

Another important point deals with the creation of party-walls. Sect. 87, which allows any building owner to erect a party-wall on the line of junction of his own and another person's adjacent land; or to build an external wall placed on his own land, and to serve notice on the adjoining owner, describing such wall. Sub-section 6 enables the building owner, after one month from service of notice, to put on the land of adjoining owner, below the level of lowest floor, the projecting footings of the external wall, with concrete, &c., making compensation to the adjoining owner or occupier for any damage occasioned thereby. This clause prevents the latter's right of action or injunction in respect of trespass. No doubt, the preparation and service of a plan and sections would be of much value in preventing misunderstandings. The expense of building a party-wall is to be defrayed from time to time by the two owners in due proportion, regard being had to the use made of the wall by the two owners respectively. The liability of building owner to make good damage and pay compensation (sect. 88) is important, and Mr. Pilditch deals with the question under several sections, and points out certain discrepancies in the clauses. Several cases under the Act occur where the building owner is liable to make good damage and pay compensation. The wording varies in each, and there are omissions and ambiguities. Thus in sub-section 8 of this section the words "internal finishings and decorations" are left out, in reference to damage made by cutting into a party structure, an omission that would be prejudicial to the adjoining owner, if technically taken; but does not the previous sub-section make the meaning clear? Again, in the sub-section referring to taking down overhanging wall in order to erect an upright wall, the building owner has to make good any damage sustained by the wall; but there is no reference in sections 95 throwing the cost upon building owner as in other sections, and the omission may give rise to dispute. Probably the question of damage is left to the decision of the surveyors. It is also pointed out it is strange that important rights given to adjoining owners under certain sections as to compensation for inconvenience, loss, or damage should not be given under subsection 6 of section 88 and of 2A of section 95, where underpinning or raising is concerned, operations that often entail damage. Certain subsections 88 and 95 are referred to, where building owners have certain rights and correlative clauses in section 95 as to costs; but in others, as in subsection 11, section 88, there is no correlative. The adjoining owner and occupier are entitled now to be compensated for damage. Section 93 is not quite clear, as to an adjoining owner being also an occupier, and some ambiguities, as to the meaning to be attached to the "owner" and "occupier."

We pass on to consider the building owner's liability to underpin in the case of the erection of a building within 10ft. of an adjoining owner's building to a lower level than the foundations. Section 93 deals with this, and is a new section. It has given rise to question. The section says, "Where a building owner intends to erect within 10ft. of a building belonging to adjoining owner a building or structure, any part of which within such 10ft. extends to a lower level than the foundations of the building belonging to adjoining owner, he may, and if required and by the building owner shall . . . . . underpin or otherwise strengthen the foundation, &c." The provisions referred to in the latter part of the clause place a greater liability on the building owner than do those under sections 88 and 95. The notice of the building owner must be accompanied by a plan and sections, showing site and depth of proposed excavation, and the adjoining owner, to create a difference must, within 14 days after being served with notice, give a counter-notice in writing that he disputes the necessity of such underpinning &c., and the building owner is liable to compensate the adjoining owner and occupier for any inconvenience, loss, or damage, &c. Mr. Pilditch refers to this section at some length, and shows certain difficulties in its interpretation and several ambiguities in the meaning of the words "to erect," &c. What are the rights and duties of building and adjoining owners under this section, and in connection with other sections 88, &c.? It does seem rather puzzling to discover whether section 93 gives a right to underpin a party-wall or not. But this section does not apparently apply to party-walls, but only to buildings erected at not more than 10ft. from adjoining owner's premises. It may mean to apply to other portions of the building, not the party-wall, in which case the building owner would be bound to serve a notice under section 93 so far as the adjoining owner's general foundations were involved. There is certainly room for several readings, and this section, with others, are involved. The author of the paper gives several hypothetical situations or readings as likely to occur, and there can be no doubt he makes a good case for a recasting of these sections of the Act.

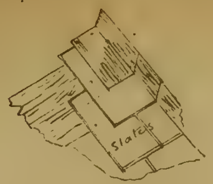
ESTIMATES.—XXXIII.

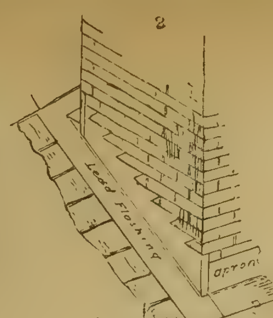
THE PLUMBER: EXTERNAL WORK.

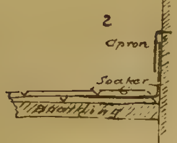
LAST week we alluded to a few of the data upon which pricing of plumbers' work depends. As a highly technical branch of building, the young estimator should be proficient in the various details, and for this purpose treatises of plumbing should be studied, though such knowledge will not enable him to price the many kinds of labour without some practical acquaintance with the subject. Like ironwork, it requires a theoretical insight as well as technical training of methods and processes, also an acquaintance with water supply and sanitary fittings which can only be learnt by a study of sanitary plumbing, including the trade lists of various manufacturers. We now limit our attention to external leadwork. We illustrate a few of the methods in use for making roofs watertight by means of gutters and flashings. Chimney-stacks require particular care, so do parapet gutters and dormer cheeks. In the former, 4lb. lead should be used as a dampcourse just below the roof covering. Our sketches 2, 3, 4, and 5 explain how the side stepped flashings, aprons, and gutters are formed. The side flashings should be about 12in. wide, resting half on roof and 6in. against wall, the upper edges being turned 1½in. into the joints of brickwork, and fixed by lead wedges; at the upper end a gutter is formed in the usual way, but the outer edge of sheet is dressed over a fillet of wood under the slates, as in Fig. 5. The front of stack is protected by an apron of lead (see sketch 2). Sometimes, instead of flashings, "secret" gutters are formed between brickwork and slates (see 5). This may be narrow, 2in. or 4in.; the slates project over the gutter. The edge of the lead under slates is bent to form a small welt to prevent water getting in.

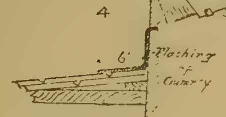
No. 6 shows a method of securing vertical surfaces of lead, as to the sides of dormers. Here a lead tack soldered to the outer lead covering is passed through the boarding, secured by copper nails on the inside, and this secures the lead from slipping. Sometimes soldered dots are employed for the same purpose.

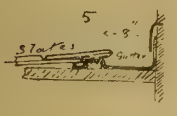
No. 7 shows the lead covering to a cornice turned down over the fillet, and fixed on top of stone by lead dowels, the upper end turned into a joint. Three kinds of joints are used in leadwork. First we have lap and drip; these are required across the current or fall. The sheet is turned over edge of boarding, and nailed at upper edge; the lower edge laps over the top edge of lower sheet 6in. or more,

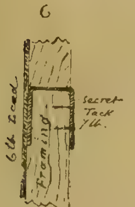


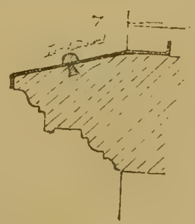












according to inclination or fall; the steeper the fall the less the lap may be. Drips are secure and more watertight on flat inclinations, and these are generally 3in.; they should not be farther than 7ft. apart. The roll seam or welt-joint is used lengthwise with fall. These are of several kinds (see treatises on plumbers' work).

The sheets for flats and gutters should be secured to each other by rolls, with bossed ends and drips. Solder should be avoided; the nailing to be done with copper nails, and lapped joints not to be less than 4in. Dormers require 6lb. lead for the side or checks, turned over and close copper nailed along vertical edge and top. The sheets are supported by secret tacks or by soldered dots. (See sketch 6.) The lead cheeks overhang the flashing of secret gutter about 4in., and have to be cut to rake of roof, and turned round front, being well dressed over window-sill, and copper nailed in water-drip or groove. Sometimes 4lb. lead soakers are used at junction of roof and dormer; the side sheets being dressed down over them.

12cwt. Milled lead in flashings to parapets.

The lead for this costs about 1s. more per cwt. than for gutters and flats, and may be priced at £1 3s., which includes labour.

5cwt. 3qr. Milled lead in stepped flashing to chimneys. (See sketches 1, 2, 3.)

This may be priced the same as last, or say—

	£	s.	d.
Milled lead per cwt.	0	16	0
Labour, nails, &c.	0	7	0
	1	3	0

2cwt. soakers laid in ditto.

These are pieces of lead in short lengths to suit length of slate, 1in. longer plus the lap, and the width of soaker is about 10in., 4in. being turned up against wall. (See sketch 1.) It is fastened to boarding of roof by copper nails. The cost per cwt. would be 16s., added to the labour of cutting and fixing, nails, &c., 3s. 6d. = 19s. 6d.

No. 6. 7lb. lead and solder to ventilating pipes.

This would probably refer to making junctions, and would cost about 2s. 9d. each.

22ft. run. Soldered seams in short lengths.

This is worth about 1s. 2d. per foot.

No. 3. Soldered angles.

Say, about 7d each.

34ft. Copper nailing to flats and gutters.

If this is close nailing, it is worth about 3d. per foot run.

No. 2. Form gutters behind chimneys, not less than 6in. wide at narrowest part, and slope both ways from centre, with 6lb. lead dressed over tilting fillet, and 6in. under slates, the ends turned up 5in. and dressed 3in. round return, covered with apron of 5lb. lead dressed 4in over flashings, and sides stepped down in brick courses with lead soakers. (Sketch 3.)

There is no quantity given for this item, nor size of stacks, so reference must be made to drawings to get weight of lead. Gutters and flashings would include wall-hooks, copper nails, &c.

	£	s.	d.
Say lead per cwt.	0	16	0
Labour laying, wall-hooks and stepped flashings, per cwt.	0	7	0
Soakers laid under slates	0	2	6
Per cwt.	1	5	6
Ten per cent. profit	0	2	6
	1	8	0

No. 14. Bossed ends to lead rolls.

These are valued at about 6d. each. These bossed ends are small pieces of lead cut to fit the end of roll, and soldering the edges.

No. 50. Labour bossing and dressing 7lb. lead to carved crockets 10in. long.

Say 2s. 6d. each, exclusive of the lead.

No. 10. Bossed ends at intersections of three rolls.

These ends take a little more labour in forming the lead, the rolls have to be mitred at the intersections, a solder joint being made round each. We may price these at three times as much if taken as an extra; they are generally included in the item for lead and labour in laying flats, &c., say, 1s. 6d.

No. 5. Ditto, four-way ditto.

Say 2s. each.

32cwt. 6lb. Milled lead over stone cornices of windows and doorway, dressed over top fillet of moulding, fastened to top weatherings by lead dowels, and turned up against wall with 5lb. flashing. (See sketch 7.)

These dressed coverings require to be neatly done, and the labour of making holes in the stone cornices and lead for the lead dowels or dots entails some trouble, say—

	£	s.	d.
Lead cost per cwt.	0	16	0
Labour, dressing round fillet, lead dowels, &c.	0	8	0
Per cwt.	1	4	0

No. 2. Covering cheeks of dormers with 6lb. lead, turned over edges and curve, copper-nailed, &c., with secret tacks, secret gutter of 5lb. lead, dressed over fillet, and 8in. under slates, and turned up 5in. against dormer, and making watertight.

Find quantity of lead from drawings, and weight out. The labour would be worth about 7s. per cwt., say 25s. per cwt., including lead, or

	£	s.	d.
Lead per cwt.	0	16	0
Labour, per cwt.	0	7	0
Copper nailing to edges	0	1	0
Soldered dots, &c., per cwt.	0	2	6
	1	6	6

INTERNAL PLUMBING.

As the Water Companies' regulations are enforced as regards service pipes from the mains, the weights have to be taken from these (see weights given last week). Most of the water companies require "extra strong" qualities. Thus a ¾in. pipe would weigh 9lb. yard, 1in. 12lb., 1¼in. 16lb., 1½in. 21lb., &c. Wiped soldered joints are generally used. The "strong" quality for these sizes is about 2lb. per yard less. The price per foot run includes joints, wall hooks, and fixing; branch joints are extra.

95ft. run. ¾in. lead supply pipe and laying.

Lead pipe is worth more than sheet lead, about 2s. per cwt. This pipe would weigh about 3lb. per foot, according to water company regulations, or 45lb. per 15ft. length, the price of which in Laxton is 6½d. per foot.

	£	s.	d.
Cost of lead pipe, per foot	0	0	6½
Labour and solder, wall-hooks	0	0	6½
Per foot	0	1	1

Say, 1s. per foot run.

20ft. run. 1¼in. lead supply pipe from main to cistern, and laying as described.

Lead pipe of this diameter weighs from 10½lb. to 16lb. per yard run, according as it is "middling" or "extra strong." If we take the latter, the weight given will be about 5⅓lb. per foot run. The weight for 12ft. lengths, according to Laxton, is 64lb., and 10d. per foot run.

	£	s.	d.
Say, per foot of pipe	0	0	10
Cost of labour, fixing	0	0	3
Solder joints	0	0	6
Cost per foot	0	1	7

This price includes wall-hooks and tacks.

120ft. run. 1in. lead pipe, and laying ditto.

	£	s.	d.
Cost of pipe 1in. diam. is put down at 9d., say	0	0	8
Cost of labour, fixing, &c.	0	0	9
Per foot	0	1	5

15ft. run. 1in. lead waste-pipe, and fixing, &c.

Waste-pipe may be of a less weight, about 36lb. for the 15ft. length, say 2½lb. to the foot, worth 6½d. per foot run.

	£	s.	d.
Cost of pipe per foot	0	0	6½
Labour, fixing, and solder	0	0	7
Per foot	0	1	1½

8ft. run. ¾in. waste ("middling" quality) and fixing.

Price this at 8d. per foot.

SOIL-PIPES, ETC.

52ft. run. 4in. soil-pipe of 7lb. lead, with collars, and fixing.

Soil-pipes are made out of 6lb., 7lb., and 8lb., as well as in composition metal and galvanised cast iron. Lead soil-pipes of the usual diameters, 3½in., 4in., 4½in., 5in., &c., are made of several weights. A 4in. pipe of 7lb. lead is worth, according to Laxton, 2s. 6d. per foot, including fixing.

	£	s.	d.
Cost of soil-pipe per foot, including labour, fixing	0	2	6
Collars, tacks, &c.	0	0	8
	0	3	2

40ft. run. 4½in. soil-pipe of 7lb. lead and fixing, with joints, lead tacks, wall-hooks, &c.

This extra size may be priced at 2d. more per foot, including fixing.

	£	s.	d.
Cost of drawn pipe per foot, and fixing	0	2	8
Wall-hooks, lead tacks, &c.	0	0	8
	0	3	4

32ft. 4in. lead soil-pipe out of 6lb. lead and fixing, &c.

A 4in. lead pipe of this weight will be about 2s. per foot run, including fixing; add for tacks, &c., another 2d. = 2s. 2d. per foot. (Soil-pipe costs about 3s. 10d. per cwt. more than sheet-lead, and would make about 20s. per cwt. A pipe of this diameter a foot long would contain about 1sq.ft. of 6lb. lead. A 4½in. pipe would be equal to about 1sq.ft. and 2in. over of sheet-lead, or 1⅙ft.)

Make proper connection of soil-pipe to drain.

The pricing of this item will greatly depend on the depth of drain or what kind of joint is intended (see specification), or whether it entails a lead bend. If only a joint has to be made in the socket of glazed pipe, or junction with cement or redlead putty and tow, the cost would be about 1s. for labour and material; but if the bottom of pipe is fitted with a brass thimble, soldered to a short bend, it would be about 10s. to 12s.

52ft. run, 3½in., 10lb. lead soil pipe, fixed at back with all necessary joints and cast lead tacks soldered to pipe, carried up to roof level.

This is a heavy pipe, and would be worth about 2s. 4d. per foot, say.

	£	s.	d.
Lead pipe per foot	0	2	4
Joints, lead tacks, and solder	0	3	0
Per foot	0	5	4

This is a high price, and a pipe of 7lb. lead would do.

No. 1. 3½in. copper wire balloon fixed on top of soil-pipe.

This would cost about 2s. 6d.

48ft. run. 2in. lead anti-siphonage pipe carried along soil-pipe, including joints and cast-lead tacks soldered to pipe.

A 2in. pipe would weigh about 10lb., and would be worth about 1s. 8d. per foot.

	£	s.	d.
Lead pipe per foot	0	1	8
Fixing, solder joints, tacks, &c.	0	0	8
	0	2	4

No. 1. 3½in. branch of lead pipe, 2ft. long, connected at one end with brass thimble-piece, and soldered to soil-pipe.

If this is of 10lb. lead it would be worth about 2s. 4d. per foot. Items are :—

	£	s.	d.
2ft. of pipe, say	0	5	0
Brass thimble and joints	0	13	0
Fixing	0	4	6
	1	2	6

No. 2. ¾in. soldered joints.

About 1s. 6d. each.

No. 2. 1¼in. soldered joints.

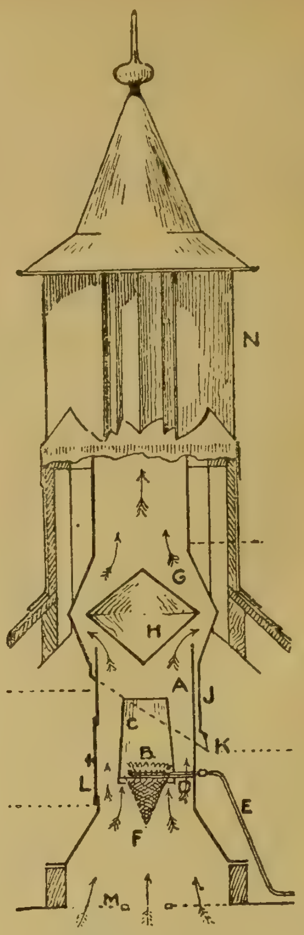
Put down about 2s. each.

* * *

The Midland Railway Company have abandoned the proposal to bring their line nearer the centre of Nottingham, and have decided to reconstruct their station on the site of the existing one, with extensions on adjoining properties. The work is to be commenced early in the New Year, and will be in progress for at least three years.

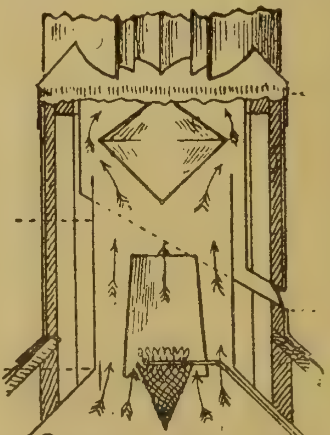
BOYLE'S THEROLITE.

The Therolite is the latest invention (patented) of Robert Boyle and Son, Ltd., ventilating engineers, London and Glasgow, and is intended to assist the up-draught in sluggish ventilating shafts and flues.



BOYLE'S THEROLITE as fitted to a Ceiled Roof.

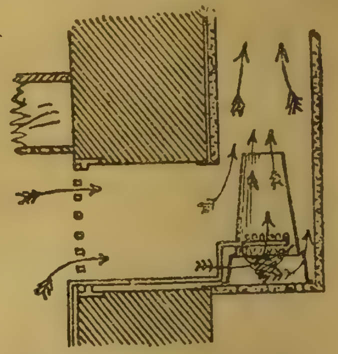
It may be usefully employed in combination with the "air pump" ventilator for the prevention of condensation, and the removal of exhausted steam from wash-houses, laundries, drying rooms, breweries, malt kilns, &c. It is also of assistance where ventilating shafts or flues are surmounted with ordinary cowls which fail to create a sufficient up-draught, and are subject to down-draught.



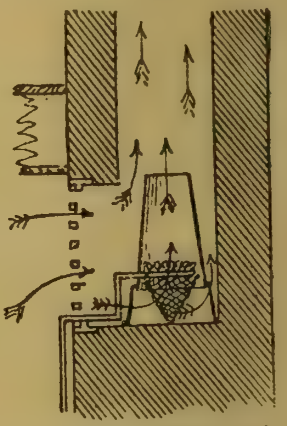
BOYLE'S THEROLITE as fitted to an Open Roof. For Wash-houses, Drying-rooms &c. for warming exhausted steam & preventing condensation

When the "air-pump" ventilator is employed —which creates at all times a powerful and continuous exhaust — the Therolite is not so necessary. When it is desired, however, to make assurance doubly sure, it may be used in conjunction with the "air-pump" ventilator, particularly for such buildings as above mentioned—as it superheats the cold steam or vapour at the point of exit, and warms the ventilator and shaft, preventing condensation and acclerating the exhaust.

The accompanying diagram illustrates the construction of the therolite. A, section of shaft of therolite, 2in. larger than ventilating shaft. B, coil-burner of improved construction, giving the maximum of heat with a minimum consumption of gas. C, cone for accelerating the velocity of the hot-air current. D, supporting rods. E, gaspipe. F, flame protector. G, expansion-chamber. H, double-spreader for deflecting the heated air on to sides of expansion-chamber, and diverting any down current into outer cylinder J, from whence it passes through valve K. The spreader also acts as a calorifier for superheating the up-current and further assisting the exhaust. L, door in shaft giving access to therolite. (Where the ceiling is not too high, the therolite may be lighted from below by means of a taper and long rod.) M, ventilating ceiling panel with opening in centre to permit of lighting from below. N, Boyle's patent "air-pump" ventilator made fireproof.



BOYLE'S THEROLITE for fitting into External Pipes



BOYLE'S THEROLITE for fitting into Ventilating Flues

An arrangement may also be fitted to the burner, which lights the gas when it is turned on, doing away with the necessity and expense of a lighting jet or by-pass.

* * *

"BUILDING NEWS" DESIGNING CLUB.

A BANK IN A COUNTRY TOWN.

We publish the three designs which we have chosen from the large number of plans submitted in this competition for the initial subject in the new session's work of our Designing Club. The selected three rank in the following order :—" Dreyfus," 1st ; " Nothe," 2nd ; " Englishman," 3rd. The conditions and instructions issued for the use of competitors were as follows :—" A.—A Bank in a Country Town in the main street, with a frontage of 50ft. The site is level, and extends 110ft. deep, with a rear right of way for dust-collecting, &c. The building to be four floors above the street level, the top rooms being partly in the roof. The basement to be used for strong-rooms in the front part, while at the rear space may be used for the manager's kitchen and offices. There must be a clerks' cloakroom and lavatory. The ground floor to comprise a banking-room 40ft. wide, and good space for the public counter, which is to be 25ft. long at least. A waiting-room and manager's room suitable for a directors' meeting to be provided. Pitch of banking-room to be 14ft. 6in. in the clear from floor to ceiling. Upstairs the space to be utilised as a residence for the manager, and having five bedrooms. The cost of the building to be limited to £8,000, cubing the whole at 10d. per foot cube. Abstract of cubing to be given. Scale for elevation and section 8ft. to the inch. Plans may be drawn to 16ft. to the inch. A perspective sketch is necessary. Material to be stone ashlar for the front. Rear side to be in brick. A private door for the manager's residence may be contrived in the bank porch; but a separate door is to be preferred. Style English Renaissance.”

“Dreyfus,” whose design takes the post of honour, has several good points in his plan. The banking-hall is spacious, and has in a simple way a well-contrived and dignified character, with the glazed dome above. The public space and counter face the entrance in a direct way, with a box for the bank porter so placed as to command the waiting-room, the door of the manager's room, and the entrance-lobby. The lift runs down conveniently into the basement, which has a privately-contrived staircase ready to hand for customers going to their boxes in the strong rooms below, and equally well placed for the use of the staff authorised to visit the basement strong rooms. We cannot say that the kitchen chimney flue is advisedly located in the safe, though perhaps the risk would not be so serious as it appears on paper. The kitchen is badly lighted, and very awkward in shape, while the pantry has only a borrowed light. A door out of the scullery into the area would have obviated this and spared the loss of space now occupied by the needless lobby. The front store-room has only a very inadequate light from a trifling area. The heating chamber might quite easily have had a window. The manager's house coal-place is exceedingly small. The upper floors are rather crude in planning, and as an example of what we mean, the second floor w.c. down-pipe would be troublesome to contrive, and it must come through the china closet and so through the wall into the area. Of course, it could be done, but “Dreyfus” should avoid such contrivances when possible. Of the façade little need be said. The tablet with “Bank” is not well placed, while both the tablet and the sundial are manifestly stuck-on features. The natural place for the designation of the building is over the main entrance. The device adopted to carry the right-hand chimney above the ridge is not one to be recommended, particularly as the rear pier, to take the thrust, is corbelled out over the second-floor level, and does not rise from the footings.

The second design, of which “Nothe” is the author, is more ordinary in its elevation, and the plan is not so good. The lighting is less satisfactory; the heating chamber is very near the strong rooms. The second staircase connects the kitchen with the house; but the lobby at its foot is not well arranged and might have been much improved. The same remark applies to the arrangement of the larder. By shifting the cupboard door, the space now lost meaninglessly in passage could have been thrown into the larder, nearly doubling its area. These are details which mar “Nothe's” work, and it is the like of these which must be overcome if good plans are to be produced. The first-floor passages are equally crude. We do not pick out faults needlessly, and we will abstain from too critical a review of the elevation. We cannot avoid saying that the corbelled-out shafts flanking the second-floor windows in the tower come very awkwardly over the ill-proportioned windows of the first floor. The deep dining-room would be none too light, so that “Nothe” could not well reduce the width of the tower window; but had he treated it as a mullioned bay, leaving out the architrave entirely, the effect would have been improved. The cloak-room space might then, with a similar window, have been utilised as a recessed bay from the drawing-room. At present it fits badly with the staircase and window levels. As a matter of fact the main staircase is rather dark, and a half-space big landing would be better than the present arrangement.

“Englishman's” design, which we place third, is more workmanlike in the elevation, though the two doorways of equal size and importance are a mistake. Both on plan fit badly with the parts into which they lead. The public space is not so light as desirable, and the manager is not well placed with regard to the banking-room or the waiting-room. The lift from the strong-room, too, in the lobby through which chance callers pass, is not a good arrangement. The clerks' cloakroom is a mere cupboard, and the lavatory is too small. The internal areas for light are very like snow-traps, and would not give much light to the first floor. We notice that the right-hand chimney-stack is arched back to the party-wall, to run up as shown in the view and elevation, but this is not good construction. A pier should have been brought up in the party-wall to do the work ultimately intended from its upper stage. “Pat” ranks fourth with a design marked by a degree of cleverness which indicates that he should do better. The projecting turret rising above the hood over the bank doorway, sits but badly in its place. The framed first-floor windows do not harmonise with the rest of the front, and the two entrances are not distinct enough in importance. The back elevation is picturesque and ingenious. The plan is commonplace; only a part of the basement is shown. The porter's box is badly contrived. The position accorded to “Pat” is largely in consequence of his endeavour to break away from the conventional in design; but if he is to improve in his work it is essential that he should attend to practical details, and not carry chimneys over voids, nor must he shift fireplaces about regardless of consequences, and then leave them out entirely, as he does in his elevation. What becomes of the drawing-room flue, and how about those from the four bedrooms above? “Alpha” sends a big view of his plain and commonsense facade, but the design is not well worked out. We give a sample. The pier to the right hand of the segmental bay falls short of the work it would have to do in carrying a girder over the banking room to bear the load of the drawing-room walls above. The front pier, in fact, is out of line with that next the left at the rear. Moreover, the cross walls dividing up the fore part of the manager's residence appear in mid-air without regard to consequences. “Prophet,” like “Nothe,” has two tower pavilions, crowned by domical roofs, to be in the mode. His perspective gives a cardboard effect, and the fenestration is not well managed. The vestibule to the bank is not direct enough with the manager's private door, facing the customers. The public space is much too big, and the plan is lacking in study. “Astragal's” view does not agree with the elevation, but his plan has several good points about it, though he, too, manipulates chimney piers about in a bold way. The shipshape scheme adopted shows directness and concentration of administrative space. The dining-room would have been much better without the pokey cupboards introduced merely to make a sideboard recess. “Wold” does sufficiently well in his endeavour to produce a well-balanced composition that we sincerely wish he had done it in a more workmanlike fashion. As it is, “Wold” is too “slap-dash,” his plan is crude, and his architecture is full of faults. The same idea of broad handling found in this suggestion of a well-conceived proposal in treating solids and voids might, with more knowledge and patience, have resulted in an uncommonly good thing. The big arched window is open to the prime objection that spandrels above its haunches obstruct a lot of valuable light. Otherwise “Wold's” elevation has merit. He has drawn it so badly that he has ruined his chance. “Vigornia” wastes room in passages on all his floors in a needless way. Good planning largely consists in reducing mere administrative space to a minimum. So obvious a rule is frequently ignored, and mere well-hole areas are a fallacy. “Vigornia” is neat and workmanlike, sending a passingly fair front elevation. “Cromer” hampers his plan with ugly contrivances at the side of his banking department, which runs right through the ground floor. The waiting-room is cramped with wasteful lobbies. The back stairs and clerks' lavatory crowd each other badly. The façade is suitable, with pedimented pavilions carried up at the ends in a bold way. Their big arched windows, however, only light attics. “Demophoon” shows his view and front in sparse outline. There is a quiet reserve about his design of which we approve, but the parts are poorly handled, particularly the main entrance, which is of indifferent proportions and weak in delineation. The plans worked round a central well of good size have merit, though the rooms are not very well shaped. The pantry stuck in at the end of the long kitchen is a mere cupboard. “Rapid” puts a dark passage in the middle of his manager's house; otherwise the arrangements are good, though the big banking-room cramps the manager's house entrance. “Rapid” is compact, and utilises his space cleverly in a straightforward way. His elevation is deficient in “go.” “Bunker” boldly recesses the central part of his building above the ground floor, obtaining in this way a terrace balcony out of the drawing-room and a big bay to the first-floor hall. The plan has novelty of treatment, with ample light. The shape of the banking-room is not very convenient with the light all at the rear. “Bunker” is likely to improve, and we hope he will not rest with his present standard of merit, because he is wanting in style, but evinces taste which, if developed, will produce really good work. “Birkie” sends three sheets instead of one. He has no cross-walls above the ground-level, save the back wall of the upper part of the building, and this is carried by a girder over the telling-room. The elevation is well defined, and suggests a Scotch influence in the upper stage. If built, it would look well; but we do not admire the attenuated pilasters at the ends. The entrance is in the centre, and the banking-room is well-lighted by a dome, which looks well in the section. “Cedric” is clever and somewhat original, arresting attention by a lively attempt to do a good thing. His scheme is unequal, and the banking-room, divided in half between the public and the staff, is not light enough. The projecting stairway down to the basement encumbers the clerks' space. The drawing-room fireplace is in a dark hole (presumably an “ingle”) awkwardly contrived against the doorway. The back elevation is distinctly good and quaint. The front is wanting in elegance. Our chief complaint is with the first and second floor architraved windows. The ground-floor fenestration too, is pimping and poor. “Cedric” we shall expect to do better things than this. “Motor Car” is ponderous, with a big range of columns running through the first and second floors. His façade, if well worked out, would look striking; but, as far as we can learn from the drawings, the detail shown is poor, and the columns are too tall in proportion. The plan is simple and fairly good. The first-floor hall is unsatisfactory. “Motor Car” has made an excellent start. He draws coarsely. “Pelikan” also, in a degree, does well, in a way avoiding regulation trimmings externally, with the result that his work has a tendency to baldness, which he gets without that desirable breadth which good design always makes conspicuous. His plans are poor, and the dark central halls and passages upstairs are absolutely bad. “Bar” is a poor draughtsman, and we are perhaps too much influenced by the first-floor oriels and plain dormers and windows marking his elevations. The tablet with the word “Bank” on between the bays is a miserable device. The plans are muddled round a central small well hole, and our commendation is very qualified. We fancy we see merit through all this, and so we wish to encourage “Bar” to try again. “A Beetle” has a commonsense elevation spoiled to some extent by a foolish grotesque of the Devil sitting on the parapet between the gables. The flat segmental bays below, and the long range of mullioned windows to the ground floor are good features. The two doorways are duplicates, which is a mistake made by others. The plan is, however, well-proportioned. The first-floor landing is wasteful, and would be very dark.

The remaining drawings may thus be classified: our space is too limited to individually mention all of them. “Speys” makes an individual endeavour certainly, and puts a circular turret on to the pavement, thereby giving an odd effect. His windows, with big block masonry, call for notice, but his whole essay is misdirected and wanting in method. He really should be able to take a better place another time. “Newlyn” also seems to possess taste. The central pediment with the sculptured figures we rather like, and the doorways show skill; but there is no merit whatever displayed by carrying the middle feature of vast big columns directly over a cluster of pimpingly small pilasters, such as those dividing the bank office windows. The rest of the designs range thus:—"Pierrot," "Go Bang," "Falcon," "Allegro," "Derbeian," "Apteryx," "Hopeful," "Anthony," "Jack," "As You Like It," "Indian Ink," "Ranji," "Apex," "Stella," "Ocobo," "E.D.," "Jove," "Tyro," "Gareloch," "Shamrock," "Povey," "Curlew," "Septimus," "My Old Dutch."

THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XVII.

FIG. 1.

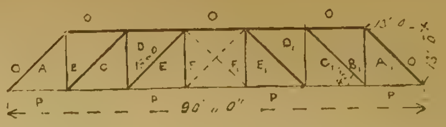


FIG. 2.

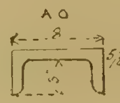


FIG. 3.

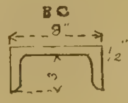


FIG. 4.

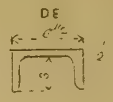


FIG. 5.

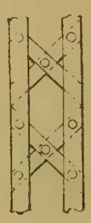


FIG. 6.

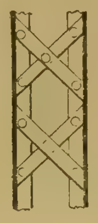
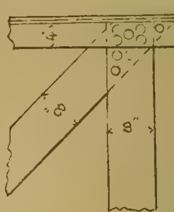


FIG. 7.



FOLLOWING the same course in the designing of the compression members in the web as was pursued in the treatment of those subjected to a tensile stress, we shall commence with the strut A *e* in Fig. 1, which has been found to have to resist the maximum compressive stress of 64 tons. Putting A and A_1, as before, for the gross and net sectional areas, we shall have—

$$A_1 = \frac{64}{6} = 10{\cdot}6\text{sq.in.},$$

or practically 11sq.in. The form of strut to be adopted may be built up in a great variety of ways, as angle, tee, channel steels, and numerous other sections, all well adapted for resisting stresses of a compressive character, may be employed with almost equally satisfactory results. In order to adhere to the rule already laid down in the last article, which, making the length of the compression member equal to L and the breadth or width of the least side equal to B, is given by the formula—

$$B = \text{or} > \frac{L \times 12}{40},$$

it is first necessary to find the value of the length L. Referring to Fig. 1, it will be seen that the depth of the truss is 13ft., and the angle of inclination of the bars of the web is equal to 45°, so we obtain from equations already enunciated and proved—

$$L = 13 \times \text{cosec. } 45^\circ = 13 \times 1{\cdot}4142 = 18\text{ft.},$$

from which the minimum width B of the least lateral dimension of the strut, which, as will be shown, is double, that is, it consists of a couple of separate members braced together with diagonal lattice bars, will be—

$$B = \frac{18 \times 12}{40} = 5{\cdot}4 = 6\text{in.}$$

A very rigid and usual form for heavy compression members in bridges is that of the channel section, which possesses also many facilities for riveting-up the necessary amount of bracing required for all long struts. Since the stresses are all of very different value for the diagonal struts A O, B C, and D E, the sectional area of each pair of channel steels, constituting with the lattice bracing the complete strut, will also vary.

The great development recently made in the process of rolling all the different sections of iron and steel enable considerably larger examples to be placed in the market than formerly. Rolled joists from 7in. to 8in. over outside width of flange, and 20in. in depth, are now supplied from our great mechanical iron firms with the greatest facility, and, under certain conditions, at a less price per ton than was formerly paid for the same sections containing barely one-half of the same amount of metal. Channel-bars, as they are somewhat irrelevantly termed, are now rolled to a maximum size of 15in. by $4\frac{1}{2}$in. by $\frac{5}{8}$in. in thickness, weighing over 100lb. per foot run. The sections of channel steel selected for the diagonal compression members in the web of the truss in Fig. 1 are represented in Figs. 2, 3, and 4, or, since the cuts are not hatched, it would be more correct to call them the end elevations of the same. The figures are lettered to correspond with the bars in the skeleton elevation of the truss, to which they respectively belong. It should be noticed that while the width and thickness of the channel steels vary, the depth—that is, the least lateral dimensions—remain constant. An elevation and longitudinal section of a part of one of the struts is represented in Figs. 5 and 6, in which the small diagonal lattice-bars may be of the scantling $2\frac{1}{2}$in. by $\frac{3}{8}$in. in thickness riveted to the channel steels by rivets $\frac{1}{2}$in. in diameter. The junction of the ties and struts with the upper flange is shown in Fig. 7, and that with the lower flange is of a similar character, but rather simpler, owing to the absence of the longitudinal angle steels used in the upper flange. The diagonal lattice bracing bars may be arranged in three different ways. They may be both riveted inside the vertical sides of the channel steels, outside them, or alternately inside and outside. Where the channel part of the section becomes too narrow to allow of the necessary riveting being readily accomplished, they must be placed on the outside.

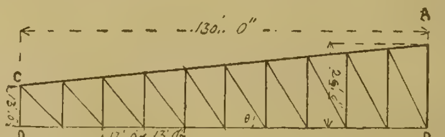


Fig. 8.

We may here leave for the present the central independent truss, and proceed with the designs for the cantilever arms. The first point to be determined is what should be the dimension to be given to the length of the cantilever arm. The whole of this question was thoroughly discussed in our tenth article (Aug. 11), and no very satisfactory or conclusive result was obtained. Numerous examples were quoted and illustrated, in which the most discrepant proportions were found to prevail between the respective lengths of the anchor spans, the cantilever arms, and the central suspended girder. The proportions of the Forth Bridge are upon too gigantic a scale to be adopted as any rule or even guidance in the case of ordinary cantilever bridges. It will be better, therefore, to base the length of the cantilever arm upon that adopted in actual practice under circumstances which are very similar to those at present under consideration; assuming that so long as the ratio between the suspended girder and the cantilever arm is observed in both instances, the principle will hold. The example selected is that of a cantilever bridge over the river Niagara. The span of the central independent girder or suspended truss is 120ft., and that of the cantilever arm 175ft., so that for the length of our cantilever arm, calling it L, we have by a very simple statement—

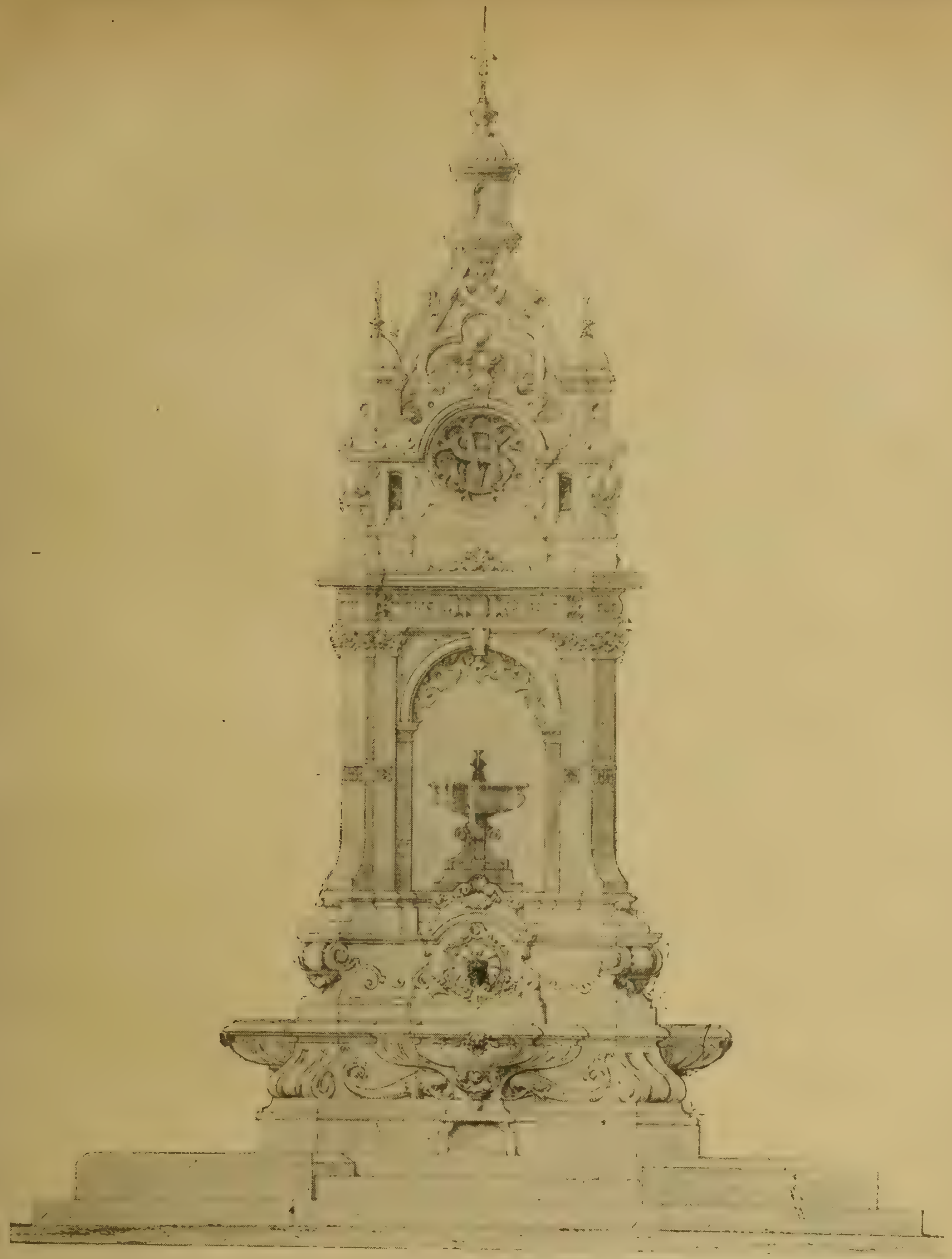
$$L : 175 :: 90 : 120,$$

from which—

$$L = \frac{175 \times 90}{120}\ 131{\cdot}25\text{ft.}$$

or, in even figures, 130ft., which is a very good proportion, and also admits of an exactly even number of ten panels in the whole length, which will maintain the uniformity of panel length adopted in the central truss. The load the cantilever arm will have to carry will consist of two parts. One is the half-total uniformly distributed load upon the central girder, which is to be regarded as hung from its free end, and the other will be its own dead and live load, also considered to be uniformly distributed over it. It will be obvious that this will necessitate two different sets of calculations, as there is no analogy whatever between the two separate theoretical computations. The depth at C D, that is, at the free end of the cantilever arm A B C D, in Fig. 8, is necessarily made equal to 13ft., since that is the depth of the central independent girder which is carried by the united resistance of that pair of arms. At the fixed end A B the depth is 26ft., as it should not, in accordance with the proportions adopted in some of the best modern examples of cantilever bridges, be less than twice the depth assigned to that of the free end. At the same time, it must be conceded that there is a very wide range, a large amount of latitude allowed to bridge designers in this respect. For instance, the depth of the cantilever arms in the great Forth Bridge, at the junction with the central suspended girder, is 40ft., whereas, the depth over the piers reaches to 350ft. It should, however, be remarked here that in the Forth Bridge the cantilever arms are thrown out from lofty-framed central panels erected over the piers, which are, in fact, intermediate towers. Besides, the rules respecting the depth to be allotted to central or pier panels when towers are used, do not apply to those cases in which central pivots are used, which are not in the other example of the Forth Bridge.

A reference to Fig. 8 will at once indicate the reason why the calculation of the stresses upon the various members of the cantilever arm are more numerous and more complicated than in the case of the central independent girder, which is simply that of a truss supported at both ends. In the first place, as will be presently seen, the cantilever arm has two descriptions of distinct loadings, very differently applied and located, to be dealt with, so that the one is not a function of the other. When discussing the purely theoretical phase of the effects of weights and loads applied to cantilevers in some of our earlier articles, the present case was investigated. It is in reality a combination of two, and each must be treated at first independently of the other, and subsequently their combined action will give the total stresses upon the different members of the entire truss. Another cause, however, exists which accentuates the labour in calculating the stresses, particularly upon the diagonal bars of the web, is that the angle θ—that is, the angle which these bars make with the horizontal is continually altering. This is an unavoidable corollary, from the circumstance that the length of the panels are maintained constant. If the value of the angle θ were retained constant, the length of the panels would vary, and not only render the elevation of the truss very unsightly, but also seriously interfere with the constructive details, owing to the disproportionate dimensions to which they would ultimately attain. Such an arrangement would also not permit of the equivalent uniformly distributed loading being divided into equal



THE "TOM SMITH" MEMORIAL FOUNTAIN, FINSBURY SQUARE.

weights supported at the lower apices of the trusses, which is a very convenient arrangement, and, moreover, facilitates the required calculation. A difference may be here pointed out between the duty devolving upon the cantilever and anchor arms respectively. The former always acts, under any disposition of either the dead or live load, as a pure cantilever, and all the stresses upon the different members of the truss must be calculated strictly on that assumption. In no case whatever does the cantilever arm require any counterbraces in the web, because it is not subjected to any stresses of a reversed or varying character. In other words, it is not exposed to the action of "reversals." Its members in tension always play the part of ties, and those in compression invariably act as struts. But in both the central independent girder and in the truss of the anchor span, reversals occur, which are provided for in the former by counterbraces at and near the central panel length, as already explained. In the anchor arm, the counterbraces are introduced at that end of the truss which rests upon the abutment, and not upon the intermediate pier whose support is common to it and the cantilever arm as well. So far as the upper and lower chords of the cantilever are regarded, the upper is always in tension and the lower in compression—exactly the reverse of what occurs in a girder or beam supported at both extremities. Another distinguishing feature of the cantilever arm is that the shearing force is always negative for all sections in it, and the moments are also of the same nature, so that they both take the minus sign when under calculation. For a further explanation and examples of these especial points, we must ask our readers to wait for our next article. T. C.

THE "TOM SMITH" FOUNTAIN, FINSBURY SQUARE.

AN addition to the decoration of the City, which will probably be best known in future as the "Tom Smith Fountain," was on Monday unveiled by Lady Jeune, and presented for the benefit of the people of Finsbury.

This handsome memorial, designed in the style of François Premier, has been erected on the south-west corner of Finsbury-square; the donors being Messrs. Walter and Thomas Smith, of Messrs. Tom Smith and Co. It is about 25ft. high, and is constructed chiefly of Sicilian marble and the beautiful Labrador granite, with certain portions in Portland and Mansfield stone.

The work has been designed and skilfully and expeditiously executed by Messrs. J. Whitehead and Sons, Limited, the well-known marble merchants, of Westminster, Aberdeen, and Carrara.

The fountain bears the following inscription:—"This fountain was erected and presented to the parish of St. Luke's by Thomas and Walter Smith (Tom Smith and Co.), to commemorate the life of their mother, Martha Smith, 1817—1898."

The new electricity works in Hunter-place, Greenock, were formally opened on Friday. The installation extends from Grey-place to James Watt Dock. Forty-four arc lamps have been erected along that route, each lamp being equal to 2,000 nominal candle-power. Extensions to other thoroughfares will be made.

A YEAR'S WORKING OF THE WORKMEN'S COMPENSATION ACT.

UNDER the title of "The Case Law of the Workmen's Compensation Act, Part III." Mr. R. M. Minton-Senhouse, Barrister-at-law, has published, through Mr. Effingham Wilson, Royal Exchange, a useful shilling pamphlet, following up his previous works on the subject, and stating the interpretation of the Act laid down by the Court of Appeal. It contains all the cases decided under the Act, and also refers to a good many of the opinions expressed by arbitrators.

The effect of the leading cases is stated by Mr. Minton Senhouse as follows:—An accident does not arise out of and in the course of a man's employment if he is doing that which he was expressly forbidden to do, or that which is outside his employment, and merely for his own purposes, but it may be otherwise where he is acting in his master's interest, though quite outside the employment. An accident does not so arise if a man is going to work upon a highway, though it may be that it would if he were passing through a large factory or works over which his employer had control. A claim for compensation, for which no form is necessary, but which must be made within six months of the accident, should not be confounded with an application for arbitration or negotiations for settling that claim, the time for commencing which is not limited. An injured workman who is unable to do the same work as before the accident may make a claim, and probably record a memorandum of the agreement or award; but if at that time he is earning the same wages as he did previously, the question of the amount of compensation should be adjourned. In order to arrive at the average weekly earnings, the fact must first be ascertained when the particular employment commenced. If the workman were away from work so as to constitute a break in the old employment, the date when he returned to work and a fresh employment began would be the commencement of the employment. The employment would, however, continue to run during a temporary absence which was not intended by either employer or workman to put an end to the employment. The total amount earned should be divided by the number of weeks the employment continued.

Employers are warned that there is risk in settling a claim by an injured man by payment of a lump sum instead of making weekly payments. The important and difficult question of when one person is wholly or partly dependent upon another has been settled by the Court of Appeal.

If an action for damages be commenced and fail, and the plaintiff desires compensation under the Act, he cannot commence proceedings in arbitration, but must ask the presiding judge to assess the amount.

Whether an erection be scaffolding is a fact that the arbitrator should determine. It need not necessarily be on the outside of a building. Wooden planks placed upon trestles 8ft. high are evidence on which the arbitrator can find scaffolding ("Hoddinott v. Newton, Chambers, and Co.") A building which is only being added to or altered is not "being constructed or repaired." Painting a building for purposes of preservation or ornament is not repairing it.

The pamphlet should be studied by every employer of labour, and also by all those who come under the provisions of the Act, for the points are succinctly set forth, and chapter and verse are cited as to every decision.

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WATER SUPPLY TO COUNTRY MANSIONS.

AT a meeting of the Society of Engineers, held at the Royal United Service Institution, Whitehall, on Monday evening, a paper was read on "Water Supply to Country Mansions and Estates," by Mr. Gordon Harris, A.M.I.C.E The author first pointed out that the subject of his paper presented features of interest in connection with minor water supplies. He observed that the cost of supplying an estate with water by the antiquated methods of either manual labour or uneconomical steam-engines was very high. A gravitation scheme is far preferable, provided the source of supply is not too far distant. The objections to manual labour were pointed out, and pumping by animal power was considered more economical than by hand power. A small steam-engine is not desirable on account of the heavy fuel bill and cost of attendance it involves. A gas-engine can rarely be used in country mansions, owing to the absence of a gas-supply; but where gas is available a gas-engine is very advantageous. The oil-engine was strongly recommended as possessing every advantage as regards its fuel supply, its simplicity, and its economy in working. The author then gave the following comparison of the cost of pumping 1,000 gallons of water to a height of 100ft. by various powers:—

	Pence.
1. Hand labour at 18s. per week	26·5
2. Horse-power, man at 18s. per week	4·20
3. Gas-engine and pump, with gas at 4s. per 1,000c ft.	1·44
4. Small steam-pump and boiler, with coal at £1 per ton	0·75
5. Oil-engine and pump, with oil at 7d. per gallon	0·70
6. Electrically-driven pump, worked from a lighting dynamo	0·45

The cost of attendance is excluded in Nos. 3, 4, 5, and 6, as in some instances it may be negligible, although in No. 4 an allowance should be made varying in amount with the total daily supply and other conditions, and an addition must be made for coal used in getting up steam. As the cheapest and most lasting water-raiser the author stated that the hydraulic ram still retained its popularity. Water-wheels, hydraulic pumps, and windmills were also discussed, and their respective advantages and disadvantages pointed out. Examples were then given of the practical application of the mechanical agents referred to, and installations of various kinds on several estates and in large establishments were described and illustrated. The author next dealt with the question of well-boring, concerning which much useful information was given. The subject of locating water by divining was also touched upon, the author observing that some very curious successes had been achieved by that means; but at the same time he instanced a case in which he was consulted where the diviner's prediction had proved utterly valueless. The details of water supply, storage, filtration, and use were then discussed, and the most desirable apparatus for the various purposes involved were described. The supply of water to small villages adjoining large estates concurrently with that to the estate itself was also referred to, and its advantages, under certain conditions, were pointed out. The important question of the utilisation of a portion of a water supply for fire-extinguishing purposes was next considered. The author observed that a large reserve must be secured for this purpose, and he described various arrangements of fire-service that he had carried out in practice. These arrangements included gravitation and power systems. For meeting cases in which there is a deficiency of pressure, the author has devised a very efficient automatic pressure augmentor, which he explained. He then described the system of fire-service adopted at St. Michael's Mount, Cornwall. In conclusion, the author observed that, failing the existence of the conditions necessary for a gravitation supply, or if the adoption of powerful machines was inadmissible for fire extinction, recourse must be had to the portable steam-engine or to the less efficient manual engine, provided the source of supply was situate within a reasonable distance.

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THE SMALLEST CHURCH IN CORNWALL.

THERE was a large attendance at Plymouth Institution, on Thursday evening in last week, to hear Mr. Edmund Sedding on "The Smallest Church in Cornwall," that of Tremayne, near Tresmeer. After briefly reviewing the main characteristics of the architecture of Cornish churches, the lecturer said that what made the church of Tremayne remarkable, lacking as it did detail and delicacy of workmanship, was the character which these old builders displayed in going into a little out-of-the-way place where there were only a dozen cottages. The colour of the stones used in its construction and the thickness of the walls indicated that the church was built probably in Norman times. It was the only church he knew in Cornwall without any sign of an aisle or transept. The upper part of the tower was of 15th century date, the lower part being at least two centuries earlier, but it was badly built. It was only 45ft. high. The pinnacles were falling outwards, but they could be brought upright, the lecturer observing that they were beginning to learn how to restore ancient monuments in this country. It was the beauty of proportion which was so thoroughly understood by old builders that made these ancient churches so charming to the eye. The eaves of Tremayne church could be touched from the ground. Perhaps the most interesting feature was the little Norman doorway, the smallest he had ever seen or heard of, it being only 18in. wide. At present it was blocked, but it was proposed to open it up. Looking at the church from inside, which was only 15ft. wide and about 40ft. long, they saw that the pulpit could only be occupied by a short preacher—a tall one would knock his head against the roof. The old roof remained unrestored, the curved ribs having been hidden by plaster at the beginning of this century, and it was a debatable point whether the plaster would not now be removed. The font was Early Norman, although most probably fashioned by Saxon workmen from Norman designs. The idea had grown among the villagers of Tremayne that the old church would have to be pulled down. He was applied to by the vicar in despair, and he suggested taking away half the wall and fixing a new piece to the remaining portion. This would not disturb the outside face at all, and the inside would be plastered up like the old. He also suggested the addition of a flying buttress in the treatment of a bulging wall. Not only did the old churches show the force of character and the love of the old builders in their work, but their age gave to them a natural beauty it was impossible to imitate. It was incumbent upon everyone, therefore, to raise his voice against the old churches being spoilt, and some strong effort ought to be made to rescue, or at any rate maintain, the works of tradition. The discussion was taken part in by Messrs. W. Martin, J. L. Osborn, P. Prance, F. Johnson, W. C. Wade, G. Jackson, Barter, Priestley Shires, F. Parker, W. Hirst, Dr. Pearce, the Rev. J. H. Haywood, and the chairman, Mr. H. M. Evans. The lecture was illustrated by chalk sketches.

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BOOKS RECEIVED.

An Elementary Treatise on Practical Mathematics, by John Graham, B A., B.E., &c. (London: Arnold, Bedford-street, Strand.)—This treatise is an attempt to make algebra and trigonometry interesting to students and to divest the study of useless theory, abstractions, and rules. It is full of easy examples of a practical kind, such as those dealing in electrical and mechanical engineering, areas, and volumes. Algebra and trigonometry are unquestionably the subjects that command the attention and study of all engineering and architectural students who desire to pass the examinations. Algebra is treated up to simultaneous equations, with numerous practical examples and problems. Those on simple equations embrace a variety of problems on subjects that will be met with in everyday practice. The measurement of angles and ratios, trigonometrical curves, and the solutions of right-angled triangles are explained easily, and will be found to contain all the problems required in the measurement of heights and distances and construction problems. The use of logarithms adds to the value of the work, and the solution of triangles by their aid will be found all that the student can desire. We unhesitatingly recommend this treatise to all students and technical colleges.——*Exercises in Graphic Statics, with Examples of its Application to Practical Designing of Constructional Ironwork*, by G. F. Charnock, A.M.I.C.E., Bradford Technical College. Part I. (Manchester: J. Holden and Co. London: Great Chapel-street, Victoria-street, S.W.)—This volume of exercises was originally prepared for the author's evening classes, and formed the substance of a course of lectures to meet the requirements of civil engineers, architects, and others in the design of constructional ironwork. The part before us deals with roof trusses, cantilevers, &c. The author proceeds from the most elementary principles, such as the notation and composition of forces, the triangle and polygon of forces, to deal with simple framed structures to which those diagrams can be applied; next the composition of parallel forces is explained. The determination of the resultant of these forces is shown by the use of the funicular polygon and polar diagram. The excellent notation of Bow's is used in lettering the diagrams, which greatly facilitates the process, and the methods of Ritter, Culmann, and Clerk-Maxwell are explained. The author also explains the determination of reactions, the method of moments, the reciprocal stress diagrams of Clerk-Maxwell as applied to various framed roofs from simple collar beam to compound trusses, and makes a useful comparison between this system of drawing diagrams and the results obtained by drawing a separate triangle and parallelogram of forces at each point. The same system is applied to king-post, queen-post, and other trusses. How to apportion the dead load on roofs and wind-pressure is shown, and practical numerical examples are worked out. The application of these principles to various descriptions of iron trusses, to tie-rods and struts, forms the larger part of the volume, the particulars of loading in each example is given, and the drawings and details are to a large scale, each member fully figured. Every type of framed roof-structure, the bowstring or crescent truss, Mansard roofs, &c , is illustrated, with its diagram of stresses. The work is a very complete treatise on graphic statics, and one advantage of the "atlas of sheets" form of book is that the diagrams are clear and drawn to a good scale, and the letterpress descriptions are printed on the same sheet as the diagrams or truss. The student who is studying this useful branch of graphic statics, as well as the architect and engineer engaged in the design of roof-trusses of timber, and of iron and steel, will find Mr. Charnock's Exercises of much value. They have all been taken from actual practice. Part II. is intended to extend the principles of graphics to cantilevers and beams, open-web or framed girders, the Warren girder, the masonry and metallic arch, bridges, &c.——*The Romance of our Ancient Churches*, by Sarah Wilson. Illustrated by Alexander Ansted (Westminster : Archibald Constable and Co.).—The authoress and illustrator have together produced an attractive and interesting little volume very acceptable as a Christmas gift book, and full of admirable and feeling sketches of our ancient churches, their features and relics. Each of the twelve chapters deals with a variety of subjects, in a chatty and interesting manner. Thus the first two chapters give an account of the foundations and gradual building of churches; their Lady-chapels, lych-gates, and other features, and we have two ancient churches, Wilmington, Sussex, and Ancroft Church, Northumberland, illustrated. Miss Wilson describes with sympathy and artistic feeling the gradual growth of such simple edifices by the addition of Lady-chapels, porches, towers, hour-glasses, sundials. Many are illustrated as vignettes in the text. Then we have a sketch of Saxon churches, Transitional work, Plantagenet, Tudor, and Renaissance work. After these two chapters of historical incident, the others deal with special features, such as triforia, clerestories, piscinæ, aumbreys, hagioscopes, crypts, brasses, tombs, effigies, towers and spires, belfries, doorways, fonts, chalices, window tracery, and chests, lecterns, and alms-boxes, minstrel galleries, and sundry other features. The last chapter describes special features in different counties ; churches close together, anthem-singing in towers, &c. By the way, in speaking of churches noted for their smallness, no allusion is made to St. Lawrence on the Undercliff, near Ventnor, Isle of Wight, reputed to be the smallest church. Snibston Church, near Packington, is claimed to be the smallest, and measures 26ft. by 13ft. ; also that of Stanmore, Westmoreland. The volume is profusely illustrated by sketches on every page, and Mr. Ansted's charmingly free style lends a poetry to the text. The authoress has brought together descriptions and sketches of numerous churches and relics in our land, and has studded every page with incidents and legends gathered from innumerable sources.——*Chimney Design and Theory : a Book for Engineers and Architects.* By William Wallace Christie, Consulting Engineer, &c. (London : E. and F. N. Spon, Ltd.)—This work is one of the very few treatises dealing with chimney construction. We noticed Mr. Bancroft's book some years ago, but we believe it is scarce. Mr. Christie is an American engineer, and has availed himself of the latest practice in this branch of design. The theory of chimney draught is treated in one chapter, and is taken from Professor De Volson Wood's paper in the *Transactions* of the American Society of Mechanical Engineers. Several rules, tables, and formulæ are given for flue area and height of chimney, &c., but we confine ourselves to the remarks on foundation and construction. As regards the bearing power of soils, 4 tons per square foot is allowed by the New York City Building Laws for solid natural earth; the Chicago laws give $1\frac{3}{4}$ tons for pure clay 15ft. or more thick, 2 tons for pure dry sand, and $1\frac{1}{2}$ tons per foot for a mixture of clay and sand 15ft. or more deep ; but these figures are below the ordinary practice ; 4 tons per square foot for pure clay has been adopted, and 1 ton per square foot for soft wet clay ; 8 tons for well-packed gravel, confined, and 4 tons for pure dry sand well packed and confined, &c. Piling, concrete, brick and stone, and other materials are dealt with, and the compression tests and tables will be found useful. Several recent examples of chimney design are illustrated, in brick and steel ; many of these are from photographs. The subject of steel chimney construction is fully dealt with, and, no doubt, where space is sufficient, a straight steel tube held up by guy-rods or wires, is cheaper than masonry. The shaft occupies less space, the chimney is rapidly constructed and erected, and is well adapted for soils of low sustaining power. The Hartford Street Railway Co.'s chimney, Conn., is 166ft. high, diameter at base of 190in., and at top 129in., the steel tubing varying from $\frac{1}{2}$in. at bottom to $\frac{1}{4}$in. at top by fractions of the inch. It has a $4\frac{1}{2}$in. lining and a 10ft. diameter flue. The construction is fully explained ; and another example of a steel chimney is at the Ridge Wood Pumping Station, Brooklyn, height 217ft., minimum diameter 8ft., and diameter at base 25ft. It is lined with brick for one half of its height, and there are 137 plates, varying in thickness from $\frac{1}{4}$in. to $\frac{1}{2}$in. The cost was 10,000dol. Many other chimneys are illustrated, and their details given—such as that of the Maryland Steel Co. The examples of brick stacks are also interesting ; that at the Omaha and Grant Smelting Works, Denver, Col., is the most remarkable and the highest in the States : it is 352ft. 3in. in height, and diminishes 13ft. at the top. It is octagonal, upon a square base ; it has an inner lining or core wall 2ft. 6in. thick, a space of 2ft. between it and the outer wall, which is 4ft. in thickness ; the upper 100ft. of it is reduced to a 13in. wall, and the core wall to 9in. This work will supply a want. Chimney design and construction has long been lacking a competent exponent, and Mr. Christie's book will be found a timely contribution.——*An Introduction to the Study of Central Station Electricity Supply*, by Albert Gay, M.Inst.C.E., and C. H. Yeaman, A.Inst.E.E. Over 200 illustrations. (London : Whittaker and Co., White Hart-street, Paternoster-square.)—The authors, who are the electrical and assistant engineers to the Islington Vestry, are in a more favourable position than many other authors on electrical subjects and books, and we can endorse the dictum of the authors that the great fault in electrical books is that they are written by the wrong men. The authors have had experience with the business of central station management and the design and maintenance of apparatus, and are, therefore, competent to write a treatise on the subject. A central station electricity supply requires a special training, in which the combination of electrical plant and building accommodation are two main things. From a glance through the pages of this book, one of the "Specialist's Series" of handbooks, the authors have directed their attention solely to these requirements. The general and special acts, provisional orders, Board of Trade regulations, &c., are described, after which the authors deal with the site and buildings required, and give plans and sections of the engine and boiler houses, dynamo-house, switchrooms, offices and stores, workshops, &c., necessary for the central station. This part of the book is of interest to engineers and architects. The other chapters deal with charging for electric supply, rates, rentals, meter supply, direct systems of supply, and the numerous plant and equipment, mains and services, street lighting, &c. The work is well illustrated and printed, the price 10s. 6d. ——*Modern Farm Buildings : their Construction and Arrangement*, by A. Dudley Clarke, F.S.I., &c. Third edition, revised and enlarged. (London : B. T. Batsford, High Holborn.)—We noticed the first edition of this useful little handbook some time ago. Mr. Dudley Clarke has now revised the work, and added an appendix on the "Model Regulations : Dairies, Cowsheds, and Milkshops," lately issued by the Local Government Board. These sanitary regulations have made it necessary to enlarge the work. Chapters are also added, with illustrations, on Cottages, Homesteads for Small Holdings, and on Iron and Wood Roofs, comparing the relative cost of each roof, &c. It is needless here to enter into the subject of the arrangement of homesteads, the principles to be observed. Several well-considered plans for these are given, for arable as well as dairy farms of 200 to 400 acres ; also plans showing the remodelling of old homesteads that will be extremely useful to those engaged in farm buildings. These plans are drawn to a good scale, and include the Surveyors' Institution design for a 400-acre farm, chiefly arable. The plans and details of every department are given—such as the straw, chaff, root, and mixing stores, cowhouses and their fittings, feeding-stalls, and boxes. Open and covered yards and their relative merits are discussed, and miscellaneous buildings like stables, piggeries, sheds, poultry-houses, cottages, &c., are dealt with. The subject is treated from the agriculturist's point of view mainly, which is, after all, the main thing, as, unless a plan shows a knowledge of arrangement and fitting up, the architect's work is thrown away. Good and well-designed buildings are important points; but they will not compensate for an imperfectly arranged and equipped homestead. Mr. Clarke's treatise should be in the hands of all architects, surveyors, and land agents.

CHIPS.

The Bradford Corporation Electricity Committee have decided to appoint Mr. Gibbings, the present engineer, as consultative electrical engineer at a salary of £350 a year, and to advertise for a manager at £350 a year.

New girls' schools are being added to the Convent of the Assumption at Carlow, from plans prepared by the late Mr. William Hague, of Dublin. They are two stories in height, and provide on each floor an assembly-hall 48ft. by 32ft., and a classroom 25ft. by 16ft. The outlay will be £2,500.

The Ontario Association of Architects have asked the Provincial Government to instruct the School of Practical Science to undertake a scientific test of Canadian timbers, with a view to ascertaining their structural strength and other features. The School of Science possesses the necessary machinery for testing timber, but a Government grant is necessary to meet the expense of cutting the wood, under proper supervision, selecting the proper varieties for comparison, and obtaining data as to the age of each tree and the condition of growth.

On Sunday the new Roman Catholic church of St. Patrick, Kilkenny, was solemnly dedicated by the Most Rev. Dr. Brownrigg, Bishop of Ossory. The old building, the site for which was given by the Ormond family so far back as 1871, had been outgrown by the needs of the congregation. The new building is Decorated in style, and the high altar is of richly-carved alabaster with mosaic panels.

The Leeds parish church organ, which was reopened on Thursday night in last week after undergoing extensive renovation and alteration at the hands of Messrs. Abbott and Smith, of Leeds, is one of the largest and best equipped church organs in the country. In connection with the reopening, a brochure has been issued setting forth the history of the organ from its opening on August 29, 1714, to the present day.

In the case of Frederick Grover, Kentish Town Wharf, N.W., and Paxton-house, High-road, Tottenham, N., trading with Walter Grover as Grover and Grover, timber merchants; the discharge from bankruptcy has been suspended for three years, ending Oct. 26, 1902 : and in that of Frederic James Silvester, Waterlooville, near Cosham, Hants, builder; the dicharge has been suspended for two years, ending Oct. 11, 1901.

A movement is on foot for the establishment of a society for the promotion of antiquarian study and research in connection with Cambridgeshire and Hunts, to be called "The Cambridgeshire and Hunts Archæological Society." Communications may be addressed to the Hon. Sec. (*pro tem.*), Cambs and Hunts Archæological Society, care of Mr. G. H. Tyndall, Minster-place, Ely. It is proposed that there should be two excursions yearly, one in each county, and an annual issue of *Transactions.*

Mr. A. M. Torrance, chairman of the Fire Brigade Committee of the London County Council, laid on Saturday afternoon the foundation-stone of a new fire-station which is to be erected by the Council in Upper-street, Islington. The new station is estimated to cost about £14,000, and the site cost another £6,200. Accommodation is to be provided for 18 men and one officer, and the station will be supplied with a horse-escape, a steamer, a hose-cart, manual escapes, and other appliances.

The written examination in sanitary building construction of the Carpenters' Company took place yesterday (Thursday), and the *viva voce* examination will proceed to-morrow (Saturday). The examinations follow the course of technical classes.

OBITUARY.

By the death of Sir Henry Tate, who passed away at his Streatham residence on Tuesday, at the ripe age of four-score years, a munificent benefactor to the nation, in the interests alike of science and art, has been removed. Much of the great wealth derived from a long and prosperous business career was freely bestowed upon the public. His gifts to University College, Liverpool, alone amounted to over £50,000. He built and endowed a Homœopathic Hospital in the same city at the cost of £30,000, subscribed £10,000 to the Royal Infirmary, and endowed numerous educational scholarships in the district. The Building Fund of Owens College, Manchester, received from him £10,000. London was enriched by him with the Gallery of British Art, built in 1895-7, and opened after enlargement at the donor's expense a fortnight ago, and to which Sir Henry Tate also gave four of Millais' best works and other fine examples by Watts, Orchardson, Waterhouse, Alma Tadema, Leighton, Gow, B. Rivière, Keeley Halswelle, and others, the building and these paintings representing a money value of at least £160,000. He also built the Central Library at Brixton at a cost of £15,000, and similar institutions in South Lambeth-road, Streatham, and West Norwood, the architect of the Tate Gallery, and all the public libraries just named, being Mr. Sidney R. J. Smith.

Mr. Thomas Huggett, of No. 9, Cromwell-crescent, South Kensington, was found dead in Logan-place, Earl's Court, on Thursday evening in last week. The deceased, who was a retired builder and contractor, was a member of the Kensington Vestry, and chairman of the Finance Committee. He was also a prominent member of the London School Board, representing Kensington in the interests of the Moderate Party. He was sixty-two years of age, but attended the Board meetings regularly, and showed no signs of failing health. On Thursday night, after attending the usual weekly meeting of the Board, he was returning home, when he dropped down dead, as the effect of heart-disease, in Logan-place, not far from his own house in Cromwell-crescent. He had erected a great part of Cromwell-road, South Kensington.

An inquest was held at West Bromwich on Tuesday respecting the death of William Bell, 53, architect and surveyor, who was found dead in a house in Hope-street, West Bromwich, on Monday afternoon. Robert Bell, of Eversley-road, Small Heath, son of the deceased, stated that his father was formerly in the employ of Messrs. Wood and Kendrick, architects, West Bromwich, but he left their service on Oct. 9 in consequence of intemperate habits. Since that time he had subsisted on loans and gifts from various people. A few days after deceased left his employment his wife separated from him, and went to reside with witness at Small Heath. She had left her husband because of his drunken habits and ill-treatment. His mother had told witness that deceased had threatened to take his own and her life. His habits were very peculiar when sober, and while in fits of passion he would smash the crockery-ware and throw the things off the table into the fire. He had been deeply in debt for years.—A boy named Edward Cotterill deposed to finding the body.—Detective Heappy described the ghastly spectacle which presented itself when he arrived on the scene. Deceased had cut his throat from ear to ear, and also stabbed himself in the left side with a knife. In his right hand he held a razor-blade, and a large butcher's knife lay beside him. He appeared to have cut his throat whilst standing in front of the looking-glass. It was stated that deceased owed £13 16s. 9d. to his landlady. He found a bottle containing poison on a shelf, and deceased appeared to have taken a portion of the liquid. A large number of bills amounting to a considerable sum were found in the room. All were unpaid, and the majority were from brewers.—The jury found a verdict of "Felo de se."

* * *

The Y.M.C.A. buildings at Belfast have been again enlarged. The large hall has had 30ft. added to it at the east end, and now seats 2,200 people. Retiring rooms have been constructed, as well as a kitchen. The additional electric lighting has been carried out by Messrs. Coates and Co., and the heating apparatus by Messrs. Musgrave. Messrs. McLaughlin and Harvey have carried out the extension from the designs of Messrs. Young and Mackenzie, architects, of Belfast.

Building Intelligence.

Aberdeen.—The workmen's dwellings committee of the town council met in the Municipal Buildings on Friday night. Messrs. D. and J. R. M'Millan, architects, submitted nine different schemes for the proposed new workmen's dwellings to be erected by the town council in Park-road and Roslin-street. The proposals ranged from block tenements with single rooms to the cottage system with two tenants to each house. Eventually it was resolved to recommend the council to adopt scheme No. 1 for the Park-road houses, and scheme No. 3 for the Roslin-road tenements. The Park-road scheme is one where the tenement is three stories high. On each floor there will be a parlour and living-room or kitchen for one tenant, a living-room and bed-closet for another, and a single living-room for a third tenant, the house thus having altogether nine tenants. The Roslin-street tenements will also be three stories high, and on the three floors each house will accommodate altogether twelve tenants. To the front there will be a living-room and bedroom for one tenant, and the same for another; while at the back there will be a living-room, with scullery, and a bed-closet on the one side, and the same on the other, four tenants altogether being accommodated on the floor. The same arrangement being repeated in each of the other two stories gives accommodation for other eight tenants. Provision is made for laying out a large playground at the rear of the houses, beyond the gardens.

Camberwell.—The Palace of Varieties, near the foot of Denmark Hill and Camberwell Green, has just been opened. It has been built from plans by Mr. Ernest A. E. Woodrow. The architectural detail and the colouring of the auditorium are Saracenic. The chief tone of the ceiling is blue relieved with a strong red. The proscenium is gold, and the drop-curtain is embroidered in a blue Moorish design. The drapery to the private boxes is blue embroidered with old gold. The carpet which covers the whole of the area floor is also of a blue tone, while the chairs are of red velvet, and the walls at the back of the auditorium are covered in a deep red paper. The auditorium is 62ft. wide and 76ft. 6in. deep, with a proscenium opening 30ft., and a stage 28ft. deep. The building, including the Golden Lion public-house, is isolated on all sides. The structure is fireproof, and there are no columns, construction with steel cantilevers being employed by the architect. The rake of the pit floor is more than the ordinary pitch.

Ealing, W.—The first section of a new Benedictine church at Ealing was opened by Cardinal Vaughan on Sunday week. The church will be Perpendicular in style. It is intended to serve for monastic, collegiate, and parochial purposes. The design is cruciform, consisting of a wide nave with narrow processional aisles, two towers forming the transepts, as at Exeter Cathedral, a choir and sanctuary, and seven chapels. The chief of these chapels are in a crypt beneath the choir, which is raised by a flight of steps on each side above the nave level, while a descending flight in the centre leads to the chapel, the altar of which is visible from the nave. At present only a small portion of the nave has been completed at a cost of £5,000. The roof of red tiles covers with the same span externally both nave and aisles, which, however, internally are divided by a lofty arcade. The roof inside is painted in colours, and richly decorated after the manner of so many still remaining in the old churches of Norfolk and Suffolk of the 15th century. The architect is Mr. Fred. A. Walters, F.S.A., of Westminster.

Edinburgh.—Extensive additions are being made to the City Chambers, so as to provide more accommodation for the Corporation and its committees and officials, and of these the first section is approaching completion. The new building is on the west side of Exchange-square, and occupies the site of the old Heriot offices and two ancient houses in Writers'-court. Its frontage to the Exchange corresponds with the style of the rest of the square—the plain Renaissance of the 17th century. The chief rooms provided in the new block are a burgh court-room on the street level, a banqueting-hall above, and on the top flat accommodation for the Corporation Museum. The new burgh court-room, in which will also be held the Dean of Guild Court, is 44ft. by 32ft., and 19ft. in height. Opening on the lobby, a judge's room and waiting-rooms for witnesses are provided. Over the burgh court, and corresponding in size to it, is the new banqueting-room, which will dine from 50 to 60 guests. *En suite* with this hall is a large reception-room. Giving access to these rooms is a section of what will be, when the buildings are completed, a main corridor connecting the present council chambers with the new additions. On the top flat is the museum, 57ft. by 53ft., and in height 23ft. On the floors below the Exchange level are three cells for prisoners, ample fireproof storage for plans and documents connected with the Burgh and Dean of Guild Courts, and a kitchen department. This new building, designed by Mr. Morham, city superintendent, has cost about £25,000.

Exeter.—The new church of Emmanuel, in the suburb of St. Thomas, was consecrated on Sunday. The foundation-stone was laid by Sir Redvers Buller on October 12, 1897. The architect is Mr. Harold Brakspear, A.R.I.B.A., of Corsham, Wilts, whose design was selected in competition, and the contractor is Mr. Pratt, of Clyst St. Mary, Devon. The inside of the church is of Pocombe stone and the outside of limestone. The edifice is capable of accommodating from 500 to 600 worshippers. The seats are of English oak with carved panels, the whole being supplied by the contractor.

Heywood.—The new church of All Souls', Heywood, was consecrated by the Bishop of Manchester on the 30th ult. The church consists of nave and aisles, chancel, morning chapel on the south side, north transept—forming choir vestry and organ chamber—and clergy vestry. A heating cellar is provided under the north transept. The chancel terminates in an apse at its eastern end, and its roof is vaulted in brick and stone. The church is Geometric Gothic in style, and affords accommodation for 450 persons. For the time chairs will be used, but it is hoped eventually to furnish the church with oak seats. The walls are faced externally with Yorkshire parpoints, and internally with specially made narrow red bricks. The windows and other internal and external dressed stonework are of Sleathwaite stone. The roofs are of red deal, stained and varnished, and covered with green Cumberland slates, and the doors and other fittings are of English oak. The floors are of pitch-pine wood blocks on a concrete foundation, except in the chancel and morning chapel, where black and white marble and tiles have been used. The church was designed by and built under the superintendence of the architect, Mr. Frank P. Oakley, A.R.I.B.A., of Haworth's Buildings, Manchester. The contractors for the whole of the work were Messrs. Blakeley and Wild, of Gregge-street, Heywood. Mr. James Berry has acted as clerk of works.

Holloway.—The Empire Theatre of Varieties was opened on Monday evening. The building is situated in the Holloway-road, at the corner of Manor-gardens. It has been erected from the designs of Mr. W. G. R. Sprague, of London, by Mr. Longden, of Neeps End, Sheffield. The auditorium is decorated in Indian style, the rich hangings and furnishings being of two shades of gold. The ceiling contains paintings representing music, dancing, &c. There are private boxes on each side of the stage, and at the back of the circle are eight boxes. In the rear of these boxes is the entrance to a refreshment saloon. From this access can be gained to a narrow balcony overlooking the Holloway-road. The approach to the auditorium is from a crush-room, also decorated in Indian style, marble steps leading to lounges, communicating with the main building. The auditorium is 55ft. wide, with a depth of 70ft. The stage is 65ft. wide, with a depth of 35ft. and a height to the grid of over 50ft. The whole building is lighted by electricity, but gas is supplied as a reserve to all parts. Numerous hydrants are fitted in various positions, and separating the stage from the auditorium is a double asbestos curtain, under the instant control of the attendant in charge. Mr. George Webber has acted as clerk of works throughout.

London County Council. — At Tuesday's meeting of the London County Council, the report of the main drainage committee, recommending a present expenditure of £1,250,000 on additional outfall sewers, was received. On the first recommendation of the committee, for the construction of two additional sewers between the Abbey-mills pumping station and the Barking outfall, at an estimated cost of £600,000, Mr. McDougall moved an amendment in favour of immediate attention to local flooding in preference to general enlargement of the main drainage system. After considerable discussion the amendment was rejected, and this and the other recommendations of the committee were agreed to. The proposal for the preparation of plans for a new men's lodging-house at Deptford on the lines of the Rowton Houses was also carried after amendments had been rejected. Mr. Shaw Lefevre (chairman of the improvement committee) mentioned that all the property required for the Boziers-court improvement, Tottenham-court-road, would be in the hands of the Council by the middle of January, after which they would proceed to demolish the buildings. The cause of the delay in carrying out the Old-street improvement would form the subject of report by the committee. It was agreed to pull down forthwith the houses forming the Strand frontage of the Holywell-street "Island," so as to widen the thoroughfare to 70ft.; the sites will be fenced in, and the houses facing Holywell-street will for the present remain untouched, negotiations for the acquisition of these properties not having been completed.

Winchester.—The new buildings for Peter Symonds' middle class school in Andover-road are now in large proportion almost completed and ready for Episcopal opening. The plans are by Messrs. Cancellor and Hill, of Winchester. The buildings are in the Tudor style, constructed in brick and tile, with enrichments in stone. Messrs. John Fielder and Son, of the same city, have carried out the work at a cost of over £5,000. This includes on the ground floor entrance, lavatories and cloak-rooms, four lofty classrooms, each for 32 scholars, also head and assistant master's room, and school for manual technical instruction. On the upper floor are a lecture theatre 25ft. by 18½ft., and chemical and physical laboratories each 26¼ft. by 23½ft. A caretaker's cottage is also provided at the entrance to the extensive grounds. A large central hall, 70ft. by 30ft., with open timber roof, will hereafter be added to the buildings, and also a residence for the head master.

* * *

CHIPS.

The city council of Leeds decided on Wednesday to make an application to the Local Government Board for a provisional order empowering them to widen Cookridge-street, to construct a new street from Albion-place to Briggate, and to increase the reservoir accommodation at Bramley.

The Board of Trade have recently confirmed an order authorising the construction of light railways in the West Riding of the County of York, in and near the borough of Doncaster.

The will of Mr. Richard Trumper, of 23, Lincoln's Inn Fields, surveyor, who died on October 26, has been proved, the value of the estate being £124,475.

Wesley Chapel, Wolverhampton-street, Dudley, was reopened on Wednesday week, after the carrying out of a number of improvements, including the installation of the electric light, consisting of 130 lamps, to supply the current for which a 10H.P. engine has been laid down. The chapel has been embellished, the organ renovated, and several structural alterations and additions have been effected. The cost of the improvements has been £900.

Mr. James Lemon, of Southampton, has been instructed to report to the Droxford Rural District Council on the best system of drainage for Bishop's Waltham.

At Fluder Farm, Kingskerswell, Newton Abbot, which adjoins the reservoir, Mr. H. E. Brown, of Barton Hall, Kingskerswell, treated all the workmen at present engaged on the new waterworks to a dinner on Thursday evening in last week. Mr. R. A. Rogers (engineer of the works) presided, and was supported by Mr. Hawkins (the contractor) and Mr. Coles (clerk of works).

A stained-glass window placed in the dining-hall of the Royal Military Academy, Woolwich, by subscriptions from officers of the R.A. and R.E. in commemoration of her Majesty's Diamond Jubilee, will be unveiled by the Duke of Connaught at 12 o'clock to-day (Friday).

A model lodging-house has been erected in Drover's lane. Accommodation is provided for about 150 persons. The site was formerly occupied by dilapidated tenements of the poorest class. The building, which is from plans by Mr. Higginson, architect, is the first of its kind in Carlisle. The beds are contained in small cubicles, but there is also a large open dormitory.

PROFESSIONAL AND TRADE SOCIETIES.

Architectural Association: Discussion Section.—A paper was read at the last meeting, on December 4, by Mr. F. C. Eden on "Church Furniture," and was well illustrated by photographs of many beautiful examples. Mr. Eden dealt with the subject in a very careful and detailed manner from the point of view of the Ornaments Rubric of the English Prayer Book, viz., the ornaments in use in the Church in the second year of Edward VI. (1548). The paper and the interesting discussion which followed it brought out many valuable principles which are often overlooked, to the great detriment of modern work.

Architectural Association of Ireland.—An ordinary meeting of the above association was held on Tuesday, December 5, when Mr. H. Norman Leask read a paper upon "Difficult Foundations and Substructures." The lecturer said that unsafe foundations were caused either by the soil being unstable, the building upon them being subject to excessive weight and vibration, or by the adjacent buildings rendering the foundations liable to sink or slide. Having dealt with wood-pile and sand-pile foundations, Mr. Leask went fully into the methods of sinking caissons under the air-lock system. The expense of these is somewhat lessened by the fact that a man will work one and a half times as hard under the greater air pressure than under ordinary conditions. The freezing process for semi-fluid soils used on the Continent was described, pipes being driven into the soil inclosing the position of the shaft to be sunk. These are filled with freezing mixture, which solidifies the semi-fluid material, and enables it to be dug out—at the same time preventing an inrush from the outside. In his description of American methods of dealing with bad soils, the lecturer showed many diagrams as illustrations. The most general method appears to be by floating the whole superstructure upon a raft of girders laid at about 2ft. intervals; the first layer across the walls, the second layer parallel with the walls, the frame thus formed being grouted with cement. Concrete was then laid across the whole site. An example of this treatment in Dublin was found in Messrs. Paul and Vincent's Manure Factory. As showing the strength of concrete for walling, Mr. Leask mentioned a chimney in America over 100ft. in height, which is built of two 6in. concrete rings with 1ft. space between the inner and outer ring, the two being only joined at intervals. In the discussion which followed, Messrs. M'Gloughlin, R. M. Butler, Hudman, and C. H. Ashworth took part. A unanimous vote of thanks was accorded the lecturer for his able and interesting paper.

Edinburgh Architectural Association.—The opening meeting of the forty-second session of the Edinburgh Architectural Association was held in the Royal Institution, Princes-street, on Nov. 28, Mr. James Bruce, W.S., the president, in the chair. In the course of his presidential address, Mr. Bruce, after a reference to the appointment of a lay brother as president, touched on the great change that had taken place within a few years in the character of the structures with which architects had to deal. With regard to architects, he thought their Association should try to secure that they were well equipped both theoretically and practically for the duties devolving upon them; that their rights were duly recognised, and their responsibilities not unduly stretched. Regarding their work, he thought their endeavour should be that buildings should primarily be safe in themselves and suitable in design for the purpose for which they were intended, that they should possess individuality, be harmonious and in keeping with their surroundings, and have in as high a degree as possible beauty of form. To those aims he would add another—that their Association should take all means in their power to see that our venerable historic buildings were respectfully cared for, that restorations, when made, were real restorations and not destructions, and that accurate delineations were made of the outline and detail of buildings that constituted the rich architectural heritage that had come down to us from days gone by. On the subject of the equipment of architects, he said they should try to make it imperative that they should possess knowledge of the law of construction, and that they should have a good grasp of architecture in its historical aspect. At present that equipment was acquired as apprentices and assistants, and they had the School of Applied Art and the Heriot-Watt College. In the University there was a chair of Engineering and a chair of Fine Art; but it did seem to him desirable that among the other chairs in their University for specific teaching they should have a chair of Architecture. Looking to the wide interest of the subject and its vast importance to the comfort and well-being of the people, it was surprising that their University did not already possess such a chair. As to their rights and responsibilities, architecture was an art as well as a profession; but still he thought they might, with advantage, encourage steps towards meeting those in Scotland who practise architecture as a profession in some recognised corporate body. At present, he understood, anyone without the slightest test of qualification might call himself an architect, and be in a position to practise as such. In this matter he thought the public were entitled to be protected. That could be got by architects being required to pass certain tests, and that they had done so could be guaranteed by their membership of some recognised body. Mr. Bruce enlarged on the other aims of the Association, referring, among other matters, to the action of successive Governments in their ill-treatment of our old historic National buildings. At the close the President was warmly thanked for his paper.

Leeds and Yorkshire Architectural Society.—An interesting lecture, entitled "Ancient and Modern Buildings in Palestine," was delivered before the members of the above society at the old Medical School, Park-street, Leeds, on Monday evening, by Mr. Beresford Pite, F.R.I.B.A., of London. Mr. W. Carby Hall presided. The lecturer pointed out that the architectural interest of Palestine began with caves, followed by rock tombs, cisterns, oil and wine presses, and sculptured and carved sarcophagi. The architectural influences began with the Egyptian, after which Phænician and Assyrian influence could be traced. Then followed a Greco-Roman period, then a period more exclusively Roman; and, passing to the Dark Ages, the Arab period was reached—the Arab busying himself with dismantling the Roman buildings, and using the materials in his own erections, very often in an absurd way. Following the Arab time came the Crusading period, which covered Palestine with the most interesting examples of Mediæval art, similar to what could be found in France and England, and even Germany. Then there followed the long period of Turkish darkness, which was succeeded by the modern era, out of which was growing a definite modern style in the European buildings; and, sad to relate, our own local Gothic revival had some rather *outré* examples in the Holy Land. The building material of Palestine was a hard limestone of coarse grain, and consequently there had not been carried out in that country any ornament worth the name. There was nothing in the whole country to correspond with the marbles at the disposal of the Greeks, or the granites at the disposal of the Egyptians.

Royal Institute of British Architects.—The following candidates have passed the final examination (qualifying for Associateship):—F. H. Allen, W. H. Ansell, S. E. Barrow, F. W. A. Buckell, T. J. Byrne, B. A. Charles, D. McL. Craik, A. H. Foster, F. Foster, S. H. Hamp, J. H. W. Hickton, M. Honan, H. E. Illingworth, A. R. Keighley, T. A. Moodie, J. E. C. Shield, J. E. Spain, R. H. Spalding, F. Taylor, R. Traquair, T. Tyrwhitt, and H. Watts. Preliminary examinations, qualifying for registration as Probationer R.I.B.A., were held simultaneously in London, Birmingham, Bristol, Cardiff, Dublin, Manchester, and York on the 7th and 8th ult. Of the 154 candidates admitted, claims for exemption from sitting were allowed to the number of 34. The remaining 120 were examined, with the result that 63 passed and 57 were relegated to their studies; the successful candidates, together with those exempted, making a total of 97 newly-registered probationers.

* * *

During new gas-main excavations at Peterborough last week outside the southern doorway of the Cloister Garth of the cathedral, the base of the arcade columns were laid bare, about a foot below the path. They were in very fine preservation. The bishop has recently had uncovered and restored the remains of the monks' Dormitory Croft in the south-east angle of the Episcopal Garden, much of which occupies the site of the monastic refectory. Some of the sedilia remain.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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Received.—H. B. Co.—H. Bros., Ltd.—E. and Co.—R. W. and Co., Ltd.—A. T.—Straight Tip.—J. F.—C. O'B.—Royal Engineer.—S. Y.—T. T. and Co.—P. Bros.

S.—Don't think you can beat the St. Pancras Co.'s paving blocks.

Reader.—All our earlier volumes before that date are long out of print. Batsford, 94, High Holborn, is sometimes able to make up sets. Write him.

Pupil.—A little outside our sphere. An "architectural motor-car" is, no doubt, a desideratum, but it is more a subject for an engineering paper. The *English Mechanic* will shortly commence a series of really capital articles on "Motor Cars," giving full designs of one to carry two, which any engineer will be able to build for £60. Look out for them.

Plumber.—Better make the lap 5in. at least.

L.—Yes, you are right; there will be a smash there some day! Have you looked at the main end wall lately?

"BUILDING NEWS" DESIGNING CLUB.

"Ajax" (Only one sheet of paper should be used. If the subject is drawn on two sheets it is very difficult to arrange the subject for illustration.)—A. S. (The front area of the town-house by 5ft. deep means, of course, 5ft. wide from the front area wall to the main wall of the house.)—A New Member. (Read the rules and the subject particulars, and you will find the exact points you ask about fully described.)—An Anxious One. (See the illustrations this week of all three of the selected designs for a Bank, and a review of the drawings submitted is also given, including your own.)—Nothe. (As local conditions vary, it will be well perhaps to decide that at least 10ft. shall be allowed between any part of the new house and the back wall of the site; but that generally the open space or yard at the back of the house must be much more than this. Compactness of planning is highly desirable.)

Drawings Received.—"Vigornia," "Rapid," "Woto," "Kruger," "Kharki," "Ocobo," "Derbeian," "Birkie," "Pat," "Arc," "Apex," "Hopeful," "Anthony," "Too Much Fag," "Stella," "Speys," "Newlyn," "Pierrot," "Indian Ink," "Jack," "F. D.," "Gade," "Astragal," "Cromer," "Dreyfus," "Pelikan," "Gareloch," "Arcadian," "My Old Dutch," "Caractacus," "Stella (Essex)," "Desdichado," "Prophet."

Correspondence.

HOWARD'S "GARDEN CITY."

To the Editor of the Building News.

Sir,—My attention has been called to an article in your issue of Nov. 24 on Mr. Howard's "Garden City." I do not wish, at present, to attack the writer's position, or refute his objections, but simply to point out the value that he, and those who agree with him, would have as members of the Garden City Association. This organisation was formed to promote the discussion of Mr. Howard's book, and, ultimately, to formulate a practical scheme on the lines of that project, with such modifications as may appear desirable. All the points that Mr. Garbett raises are well covered by that final clause. Neither Mr. Howard nor his helpers have ever supposed there was anything absolute in the diagrams adopted or the figures used. The only essential features of the scheme are the practicability of relieving the pressure of the housing problem by a migration of population to new areas; the necessity of buying the land at agricultural values; the substitution of a municipal for a private landlord; the laying-out of the city according to a careful plan, so as to obtain the best combination of town and country, of use and beauty. To attain these ends, we are ready to make any alterations that commend themselves to the wisest and most expert judgment. Whether the city be round or hexagonal, whether its roads are circular or straight, whether its railway girdles or trisects it, whether its streets are named after places or men, matters not, if only the end is reached of providing some outlet for the congested population of our large towns, and of offering to the citizens of the new area a life that offers at once full advantages of health, beauty, and commercial prosperity.

As I said, in commencing my letter, my aim in writing this is not to confute Mr. Garbett, but to suggest that he should bring his ideas and plans into the Garden City Association (Mr. Steere, secretary, 4, Stone Buildings, Lincoln's Inn), where they would be met, not as the criticisms of an opponent, but as the suggestion of a friend of the main idea.—I am, &c.,

W. Charter Piggott,
Hon. Sec., Literature & Lecture Section, G.C.A.

Sir,—Your issue of November 24 contained a letter from Mr. E. L. Garbett upon the above subject. The heading of that letter, "Against Howard's Garden City," appears to me misleading, as the writer, after some very pertinent remarks upon the question of overcrowding and the housing problem, says:—"The real remedy is suggested by Mr. Ebenezer Howard, in a book called 'To-morrow,'" and the remainder of his letter is taken up with a criticism of the plan of the proposed city. The particular plan published in Mr. Howard's book is not an essential part of the scheme, and could, without doubt, be improved in many respects. The plan does not pretend to be that of the actual city, but merely a diagram as a basis for discussion and improvement. Mr. Garbett's plan has many good points worthy of consideration, but is also open to objections.

Modern requirements have shown the necessity for main arteries for traffic which shall lead direct from the various stations to the factories or warehouses. No such arteries exist upon Mr. Garbett's plan, but a maze of streets of equal and comparatively narrow width, through which the traffic would have to wend its circuitous and tedious way as best it might. Foot passengers, too, would have to cross a main street at every few yards in their walk. The arrangement by which every house faces a garden is good; but what would the backs face?—presumably one another, and if the buildings were high a deep kind of pit or well would be formed in the centre of each hexagon, in which air from all the back premises would stagnate.

It is hardly worth while discussing the names of the streets at present; but whatever system our American friends may adopt, I am inclined to think that the conservative inhabitants of these islands would prefer to retain names which have some association attached to them than be numbered and ticketed like the books in a public library.

When, however, Mr. Garbett attacks the proposals to limit the size of the city he is approaching a much more vital point, and one upon which Mr. Howard has done well to take a firm position. Mr. Garbett's illustration of the Israelites is entirely beside the mark, simply because a camp is not a city, nor even what he calls "a temporary city." If our cities were built to last for twelve months only, and then, after the inhabitants had been transferred to a new and sanitary site, the old buildings were demolished and the ground ploughed up or left to the revivifying influences of nature, the case would be quite different. In Mr. Garbett's city, would he be satisfied with buildings only one story high? In the camp to which he refers, the distance apart of the tents was fixed by law so as to prevent overcrowding if more than one story were allowed, the houses would have to be further apart in proportion. We may learn much in sanitary matters both from the Israelitish camp and from many savage tribes; but it is manifestly unfair to take the one item of population only, and apply it to our own modern city life, which is so different in every way.

It is most desirable not only that there should be no crowding within the limits of the town, but that every inhabitant shall be within easy reach of the country itself, and not merely of railed-in parks, however useful they may be. No one can for a moment imagine himself to be in the country in the most obscure recesses of Hyde Park, and nothing will take the place of a close and intimate association with the forces and beauty of nature, if all the faculties and instincts of our higher life are to be developed. The vast and ugly growth of modern cities is one of the greatest dangers of our times, and is the parent of innumerable social and sanitary evils. If the coming generations are to go forward or even hold their own as physically and morally healthy men and women, their view of life must not be shut in by interminable rows of dismal bricks and mortar, but they must have the opportunity of immediate daily contact with all forms of beauty, of which the greatest is Nature herself. Mr. Howard's suggestion of a population of 32,000 is reasonable; on the other hand, it is certain that the vast cities of modern times are both unnecessary and undesirable.—I am, &c.,

H. C. Lander, A.R.I.B.A.
Effingham House, Arundel-street, W.C., Dec. 4.

CHIPS.

Colonel Durnford, Local Government Board inspector, held a public inquiry, in the council chamber, Consett, on Friday, into applications made by the Benfieldside Urban District Council, to borrow £1,000, and the Consett Urban District Council, to borrow £2,000, for the enlargement of the Benfieldside public cemetery.

A Comberford memorial pulpit has just been erected in Carlow Cathedral. It is of Austrian red oak, and is 20ft. in height to the sounding board. The panels of the sides of the rostrum have carvings in the arcades of "The Sermon on the Mount," "The Sermon on Mars Hill," "The Sermon at Tara," executed in high relief. Between these arcades, at the angles of the pulpit, are statuettes of the Four Evangelists, and of St. Brigid of Kildare. There is also a carved Crucifix at the back of the rostrum. The pulpit was designed and executed by Mr. M. J. C. Buckley, of Youghal.

The Duke of Cambridge on Saturday visited Lowestoft for the purpose of cutting the first sod of a new promenade pier on the North Denes at that town. Access to the pier, of which Sir Douglas Fox, Pres. Inst. C.E., is the engineer, will be afforded by a road widening down from the upper lighthouse. This avenue will be wide enough to accommodate an electric tramway, and will have shops and restaurants on either side. The approach road will be 610yds. long, and will terminate in a screw-pile pier 233yds. in length. An outer landing stage will be attached to the pier for the use of steamers and other vessels.

The City Council of Coventry, having applied to the Local Government Board for approval of the appropriation of certain corporate land situated in Hales-street (the site of the old baths) as the site for a fire brigade station and firemen's cottages, and for sanction to borrow £6,068 for purposes of street improvement, £5,300 for fire brigade purposes, and £279 for works of sewerage, Col. A. C. Smith, R.E., Local Government Board inspector, conducted an inquiry at St. Mary's Hall on Wednesday week.

At the last meeting of the Wrexham Town Council it was reported that the Local Government Board had sanctioned loans of £20,000 for electric lighting and £1,800 for public baths, and that they were considering the council's application for leave to borrow £2,100 for a refuse destructor.

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ILLUSTRATIONS.

RAMSGATE CONCERT HALL.—WOLVERHAMPTON WORKHOUSE.—"THE FIGHTING COCKS," MOSELEY.—HOUSE AT OXFORD.—DESIGNS FOR A COUNTRY BANK.

Our Illustrations.

BOROUGH OF RAMSGATE CONCERT HALL.

These designs were placed first by a professional assessor in a recent open competition promoted by the corporation. The carrying out of the work is being delayed pending the settlement by the corporation of financial arrangements to enable them to carry out these and other important works. It is contemplated that early in the New Year instructions will be issued to proceed with the carrying out of the works. The concert hall is entirely underground, being approached by a sloping way 14ft. wide for Bath chairs, &c. A staircase and hydraulic lift are also provided. Staircases are also provided on the face of the cliff communicating with the lavatories, provided for men and women as public conveniences. The concert hall is on the lower floor, 147ft. by 63ft., and about 30ft. high, with large gallery. Cloakrooms and lavatories for women and men are provided in connection therewith. In order to minimise the appearance of lowness, the hall has been divided into a wide centre aisle and two narrower side ones by means of light iron columns and arcading. This treatment has the practical advantage from a constructional point of view by rendering the use of heavy girders unnecessary. The plans, as published, explain themselves. The estimated cost is about £16,000. Messrs. Ardron, Dawson, and Howell, of Westminster, are the architects.

NEW WORKHOUSE AND INFIRMARY FOR WOLVERHAMPTON: SELECTED DESIGN.

The building of this important institution is shortly to be commenced on a site at New Cross, a mile and a half from the town. Mr. Arthur Marshall, A.R.I.B.A., of Nottingham, the architect of the building, has furnished us with the following particulars. The buildings are divided into the following distinct groups:—

	Males.	Females.	Total.	
Workhouse—				
Able-bodied	60	80	140	
Partially able-bodied and old.	330	110	440	
Married couples	20	20	40	
Nursery	—	24	24	
Receiving wards	15	10	25	
Infirmary—				669
Surgical, medical, and chronic	160	120	280	
Lying-in	—	16	16	
Syphilitic and skin	16	10	28	
				332
Infectious wards	20	20		40
Imbeciles—				
Imbeciles	60	60	120	
Epileptics	30	60	60	
				180
Casuals	50	20		70
Nurses' home	—	—		20
				1,301

Roughly speaking, the general arrangement of the buildings will be understood from the bird's-eye illustration. There is one main entrance only, and this is controlled by the porter's lodge with weighing house. The road passes by the board room and out-relief department on the left and the receiving wards on the right. The chapel is passed and the main entrance to the workhouse reached. On either side of this are master and matron's residences, assistant master's rooms, &c., the dining-hall and administrative block being behind. On either side are covered ways leading to the aged and able-bodied blocks. The road is continued on either side across the covered way, passing the engine-house and laundry on the female side, and the workshops on the male side, until the infirmary is reached, beyond which the imbecile wards are placed, and diverging to the right is the infectious hospital, occupying the extreme N.E. angle of the site. The casual wards are placed near the road on the S.W. angle of the site, and have a separate entrance. The mortuary and post-mortem rooms are at the back of this block. By this arrangement of the various buildings over 20 acres of land will be available for agricultural purposes. A considerable advance in the classification of the inmates is made by the provision of 50 separate sleeping cubicles for each sex of the deserving, ten of these being arranged in each pavilion, and these have their own dayrooms. Great attention has also been paid to the classification of the other classes of inmates, which is amply provided for. The whole of the buildings will embody the most approved and up-to-date features, both as regards general planning as well as in sanitary and other matters. Electricity will be used for lighting, and every block will be connected by telephone. The contract has recently been let to Messrs. T. Fish and Sons at £156,879, and the work is being commenced at once.

"THE FIGHTING COCKS" HOTEL, MOSELEY.

This new house, for the Holte Brewery Co., has been erected on the site of an old house which was of very little interest. The work has been carried out in Derby Dale stone and sand-faced bricks, with roof of stone slabs. The dome is covered with copper. The whole of the fittings for bar, billiard-room, and smoke room have been designed by the architects, Messrs. T. F. W. Newton and Cheatle, of Newhall-street, Birmingham, and the work has been carried out in a most satisfactory manner by Mr. E. J. Charles, of Moseley.

HOUSE IN OXFORD FOR THE REV. J. H. MEE.

This house, which has recently been completed, stands in Mansfield-road on a corner site opposite Manchester College. It is, therefore, close to the centre of Oxford, and, at the same time, has the advantage of the open space afforded by the cricket-grounds and the Parks beyond. The chief feature of the house is the main hall, which is carried up the full height of the building, and has an open-timber oak roof. The staircase and panelling to the hall are also in oak, enriched with carving. The exterior of the house is faced with Taynton stone, and the roofs are covered with Broseley tiles. The contractors were Messrs. Symm and Co., of Oxford, and the work has been carried out from the designs and under the superintendence of the architect, Mr. Arthur Blomfield Jackson, Mecklenburgh-square, W.C.

"BUILDING NEWS" DESIGNING CLUB: A BANK IN A COUNTRY TOWN.

(For description and awards see p. 756.)

* * *

Fifty additional electric cars are to be ordered by the Leeds Corporation from Messrs. Dick, Kerr, and Co. for £28,000. They are to be delivered at the rate of ten a month.

At the meeting, on Friday, of the Newcastle-on-Tyne board of guardians the question of remodelling the workhouse was discussed, in view of the approaching removal of the children to the new cottage homes, and the possible removal of the imbeciles to Coxlodge Asylum; the pressing requirements being a new mortuary, an enlarged vagrant ward, and provision for "remand" cases from the police-court. It was agreed that Mr. W. L. Newcombe, F.R.I.B.A., Newcastle, should be invited to advise the Board upon the question.

The Doncaster Urban District Council have appointed Mr. W. R. Crabtree, assistant in the city surveyor's office at Sheffield, as highway surveyor. There were 60 applicants.

New Roman Catholic schools in East-row, Kensa Green, were opened last week by Cardinal Vaughan They have been built at a cost of £4,000, and accommodate nearly 900 children.

COMPETITIONS.

Blackley.—In a competition for architects' designs for the intended library and public hall at Blackley, a committee of the Manchester Corporation has awarded the first premium to Mr. John Gibbons, of Cross-street, Manchester. The step taken has met with the approval of Mr. Levy, as representing David Lewis's Trustees (who are defraying the cost of the Hall), and a letter has been received from him offering also to provide for the cost of a children's shelter in the adjacent playground, estimated at £750.

Garston, Liverpool.—At the meeting on Tuesday of the urban district council, the technical instruction committee recommended that a technical school be erected on the site already acquired as part of the land secured for the park, fronting Garston Old-road, at an estimated cost of £7,000, including the permanent fittings. It was also decided to ask a number of architects to send in competitive designs for the building, for which two premiums of £50 and £30 were to be offered. The motion was unanimously adopted.

* * *

CHIPS.

The reredos in the parish church of Stockleigh English, Devon, which was found mysteriously smashed to pieces some time ago, and which had been erected by the rector (the late Rev. G. Dowty), aided by the munificence of the late Marchioness of Salisbury, has been restored to its former beauty, and was rededicated on Sunday. The restoration was carried out by Messrs. Harry Hems and Sons, of Exeter.

At the last meeting of the Town Council of Canterbury the resignation of the city surveyor, Mr. A. H. Campbell, who has been appointed surveyor of East Ham, was accepted, and it was agreed to advertise for a successor at a salary of £300 per annum, office and staff provided, but private practice prohibited.

Three stained-glass windows have been placed in the chancel of the recently restored parish of Cringleford as memorials. The east window represents the Angel announcing the Resurrection to the Three Holy Women, and the two windows on the south side contain figures of SS. Peter and Ethelbert of York. The artists are Messrs. Lawes and Westlake, of Endell-street, Bloomsbury.

At Bingley, on Friday, Messrs. W. R. and R. Atkinson, joiners and builders, were summoned for not having a hand-feed planing machine properly fenced. On October 12 a workman named Barwick met with an accident when there was no guard on the machine. Mr. W. R. Atkinson said he had notices posted instructing the workmen not to use the machine without the guard; but on the date named the workman had, contrary to instructions, taken off the guard. The Bench imposed a fine of £5 and costs, making a total of £5 17s.

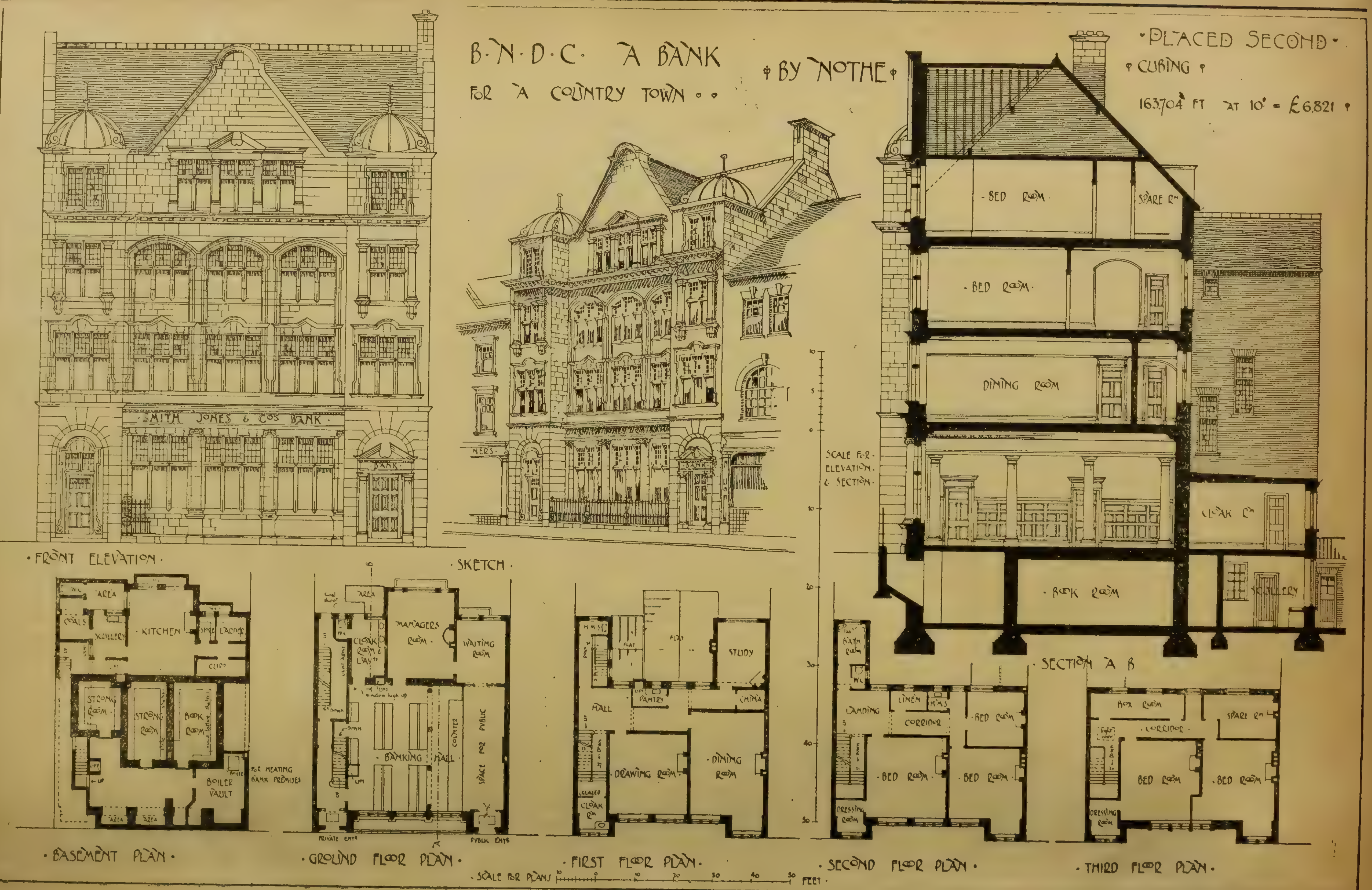
The urban district council of Nuneaton have voted their surveyor, Mr. J. S. Pickering, an honorarium of £525 for carrying out additional sewerage and other engineering works.

Mr. Douglas Young, F.S.I., of the firm of Douglas Young and Co., 51, Coleman-street, E.C., has been appointed surveyor to the North-West London Railway. This is a new line running from the Marble Arch (where there will be a connecting interchange with the Central London Railway), and thence along the Edgware-road to Cricklewood, the line being four miles in length, with eventual developments north and south of a very important character.

Mr. Batsford will publish, next week, a volume entitled "Old Colonial Houses of the Cape of Good Hope," in which many of the quaint and picturesque buildings erected by the early Dutch settlers are illustrated from sketches in pen-and-ink or crayons by Mrs. Alys Fane Trotter, and by half-tone reproductions from photographs. Mrs. Trotter's interesting notes upon the subjects are accompanied by a short account of the "Origin of Old Cape Architecture," by Mr. Herbert Baker, A.R.I.B.A., with sketches by its authors, and the whole forms a valuable monograph of the very interesting style or blending of styles in architecture invented by the early settlers. It is a pleasant surprise to find that so many good and typical examples of these old houses yet remain within a few miles of Cape Town. The size of the volume is royal quarto.

Three figure windows have just been fixed at Dorchester Union. Subjects: The Light of the World, St. John, and St. Peter, executed by Messrs. Swaine, Bourne, and Son, Birmingham and London.

St. John's School, Banbury, is being warmed and ventilated by means of Shorland's patent Manchester grates, patent exhaust roof ventilators, and special inlet tubes, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.


B·N·D·C· A BANK
FOR A COUNTRY TOWN
BY NOTHE
·PLACED SECOND·
CUBING
163704 FT AT 10d = £6,821
SMITH JONES & Co's BANK
BANK
·FRONT ELEVATION·
·SKETCH·
SCALE FOR ELEVATION & SECTION
BED ROOM
SPARE Rm
BED ROOM
DINING ROOM
CLOAK Rm
BOOK ROOM
SCULLERY
SECTION A B
AREA
COALS
SCULLERY
KITCHEN
STORE
LARDER
CLOSET
STRONG ROOM
STRONG ROOM
BOOK ROOM
BOILER VAULT
FOR HEATING BANK PREMISES
AREA
·BASEMENT PLAN·
AREA
CLOAK ROOM & LAVY
MANAGERS ROOM
WAITING ROOM
BANKING HALL
COUNTER
SPACE FOR PUBLIC
PRIVATE ENTce
PUBLIC ENTce
·GROUND FLOOR PLAN·
STUDY
FLAT
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CHINA
HALL
DRAWING ROOM
DINING ROOM
CLOAK Rm
·FIRST FLOOR PLAN·
BATH ROOM
W.C.
LANDING
LINEN
H.M.S.
CORRIDOR
BED ROOM
BED ROOM
BED ROOM
DRESSING ROOM
·SECOND FLOOR PLAN·
BOX ROOM
SPARE Rm
CORRIDOR
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·THIRD FLOOR PLAN·
·SCALE FOR PLANS
FEET·

WOLVERHAMPT

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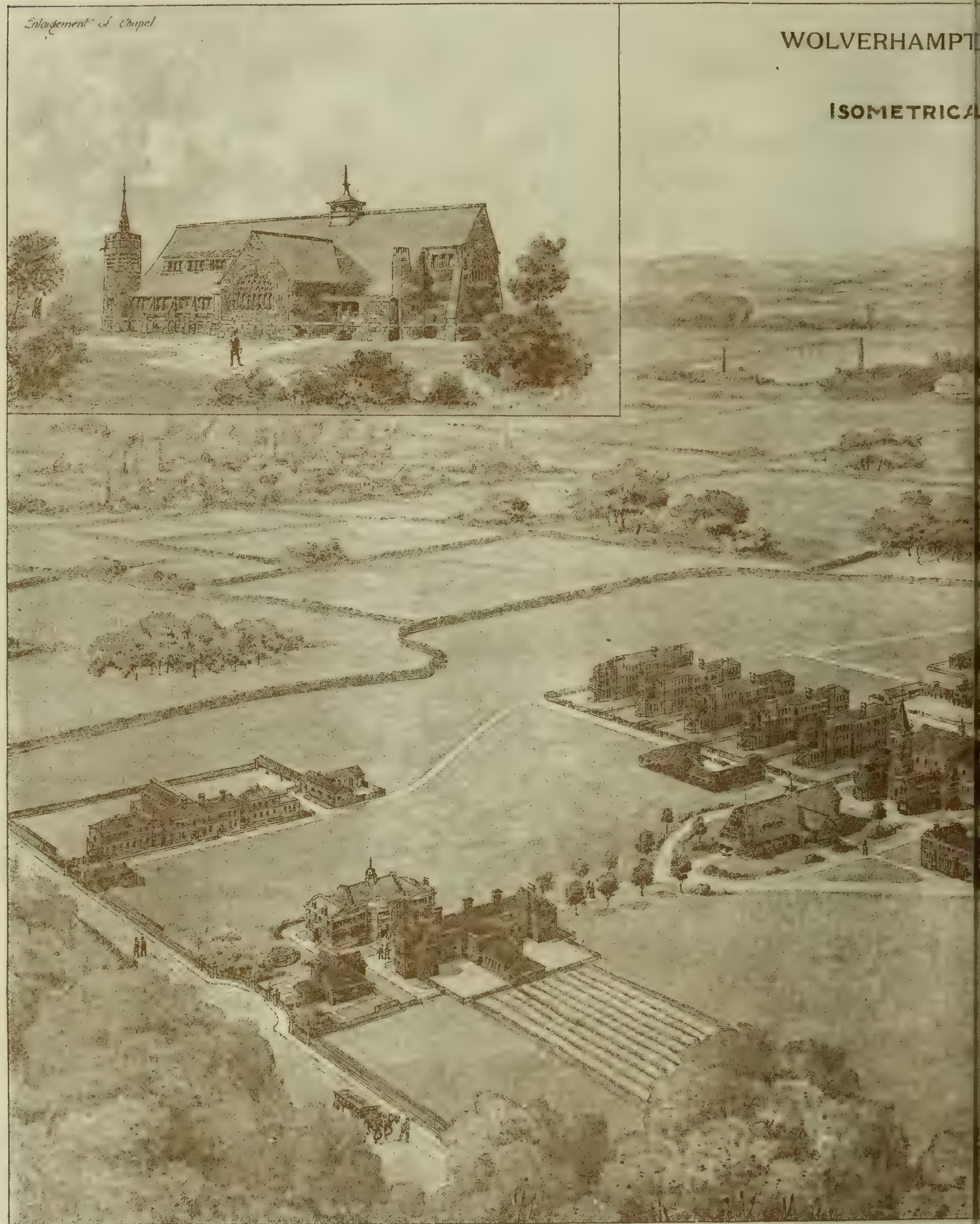
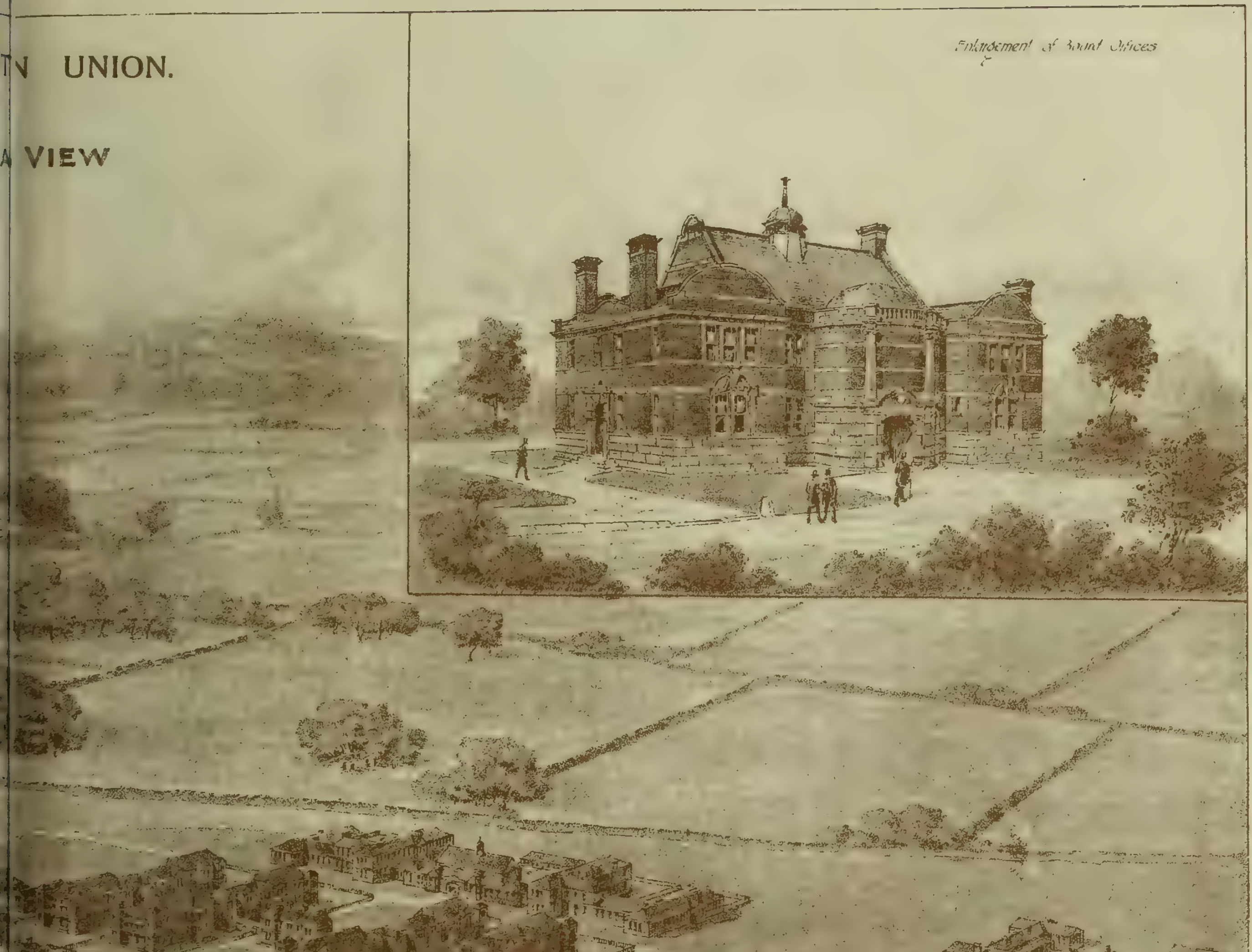


· WOLVERHAMPTON WORKHOUSE · Se

N UNION.

VIEW

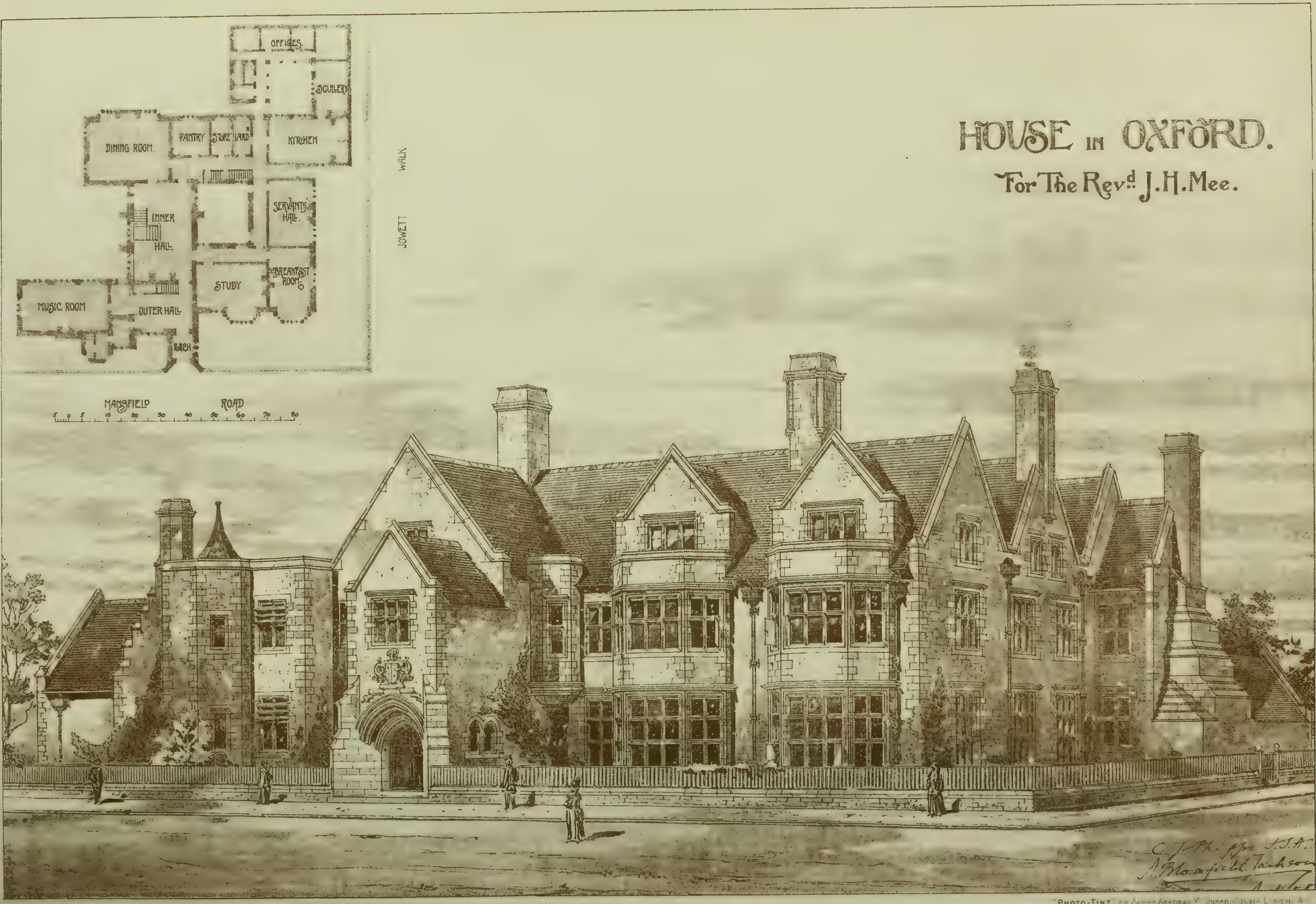

Enlargement of Board Offices
Arthur Marshall.
A.R.I.B.A.
Architect. Nott^m

"PHOTO-TINT" by James Akerman, 6, Queen Square, London, W.C.

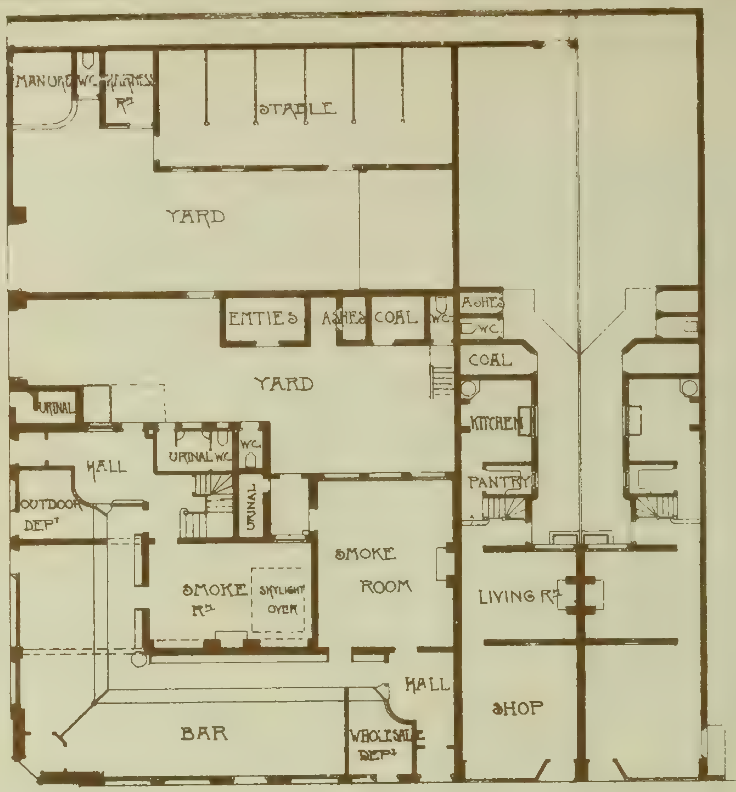
TED DESIGN ARTHUR MARSHALL ARCHT.

HOUSE IN OXFORD.

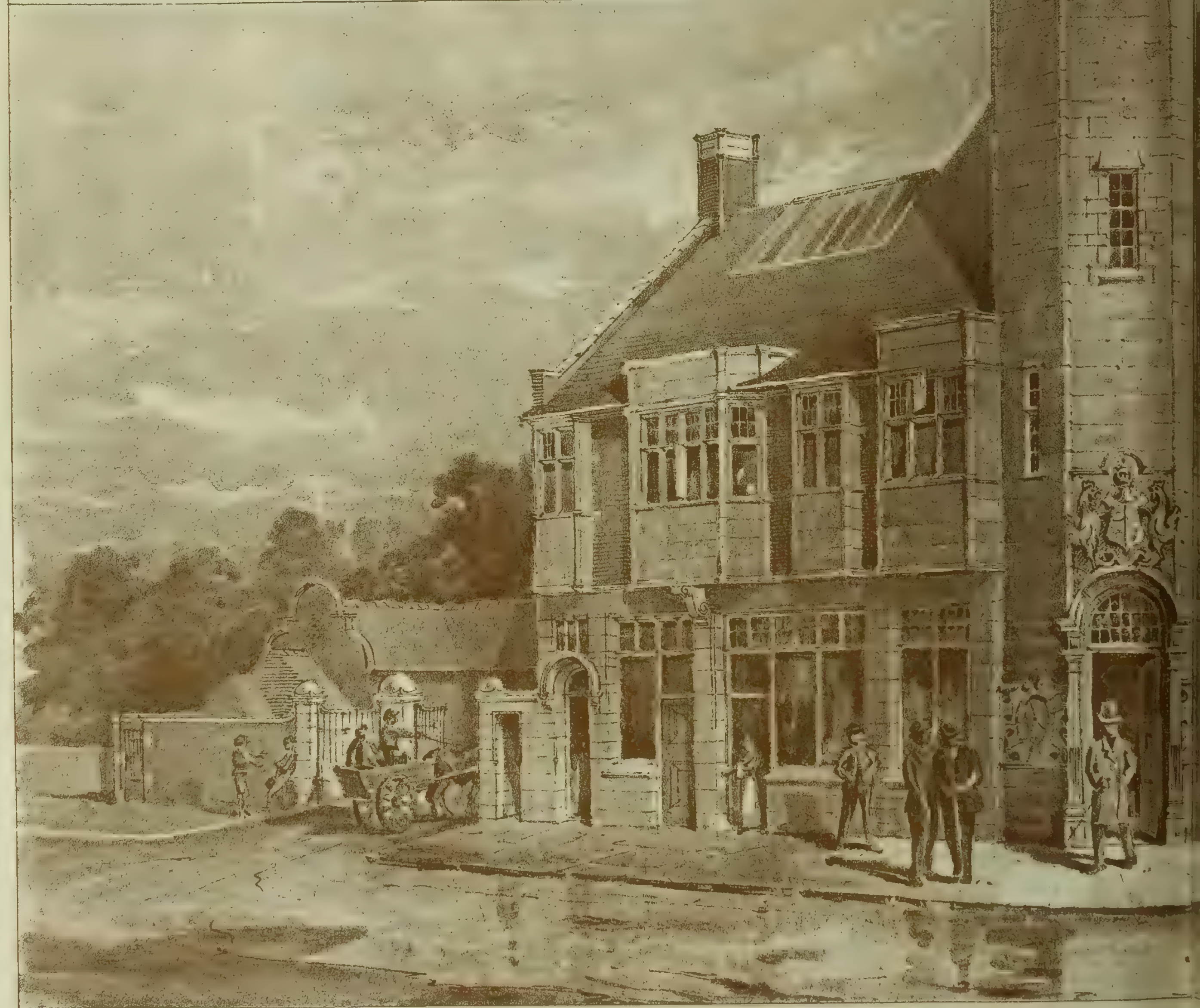
For The Revd. J. H. Mee.



"PHOTO-TINT" by James Akerman, Queen Square London.



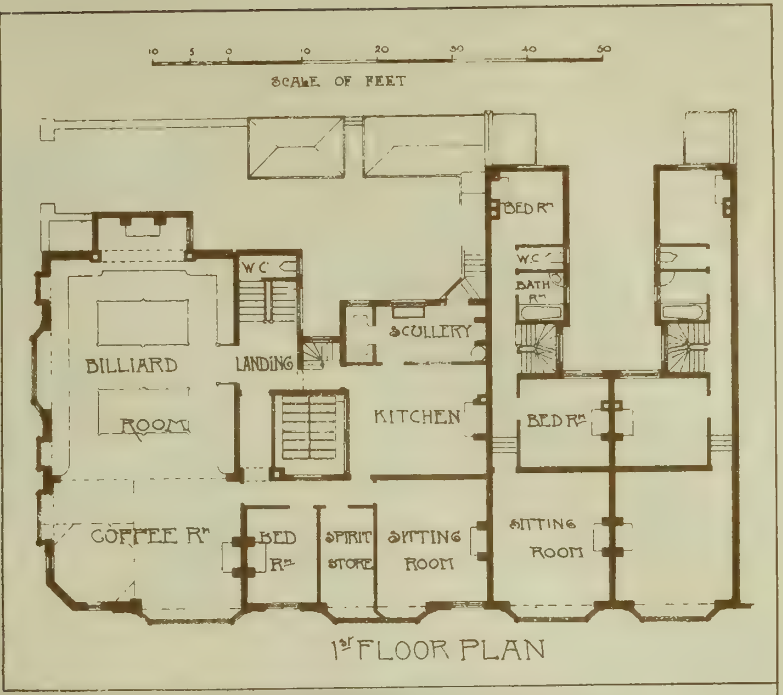
GROUND PLAN



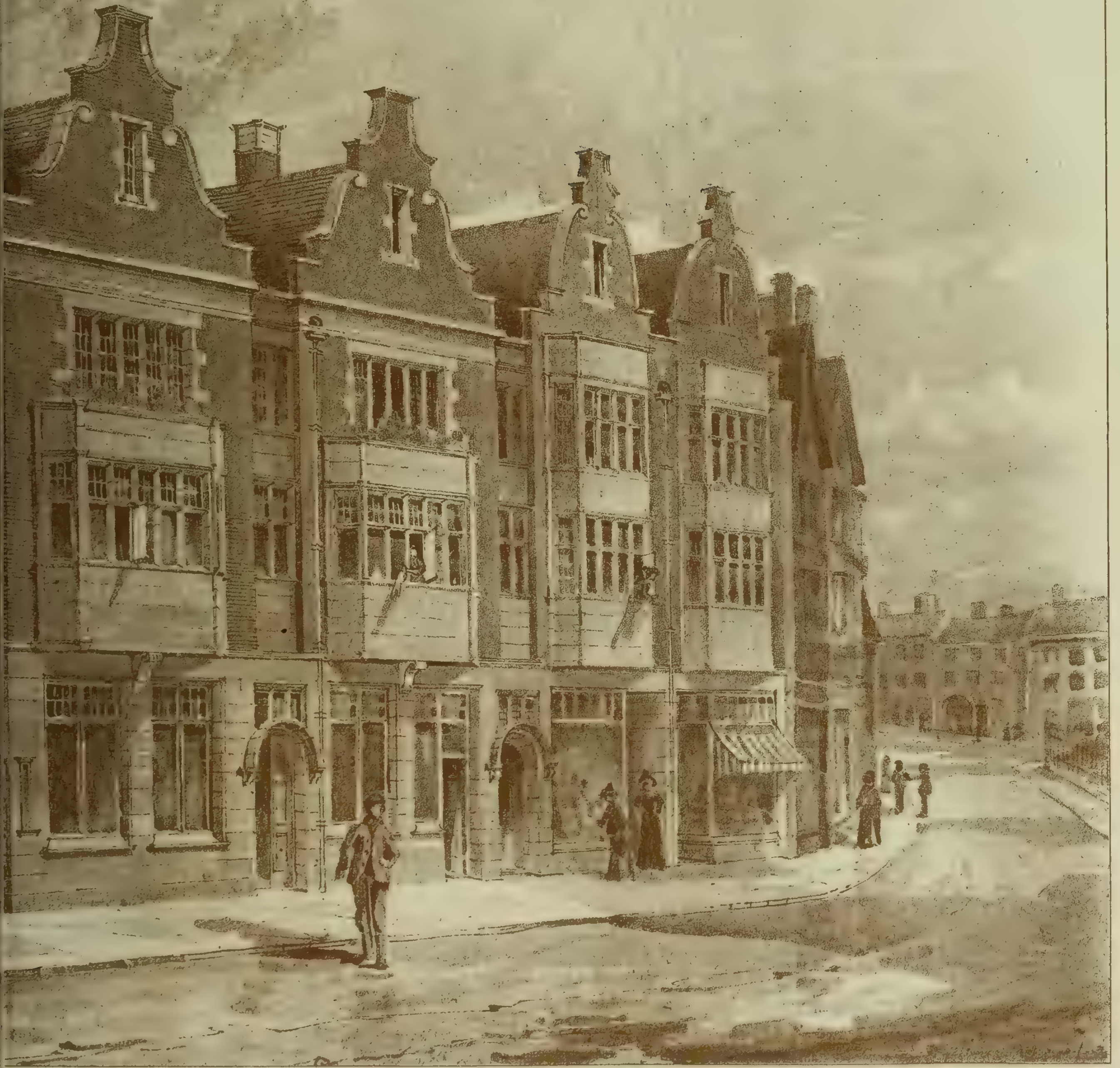
"THE FIGHTING C

W. F. NEWTON AND CHEATLE

ARCHITECTS



1st FLOOR PLAN



KS' MOSELEY

'PHOTO-TINT' by James Akerman, Queen Square [illegible]

·PLACED FIRST·

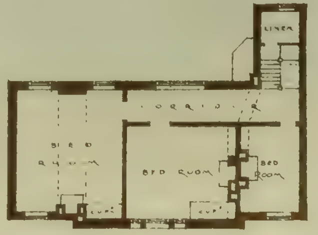
BUILDING NEWS DESIGNING CLUB
A COUNTRY BANK
BY "DREYFUS"

ESTIMATED COST

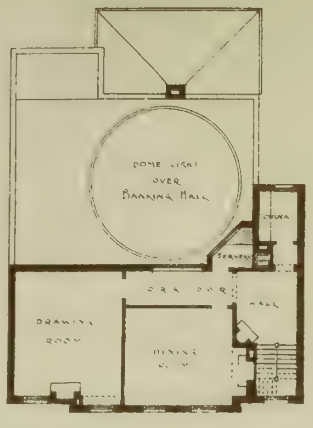
127175 CUBIC FEET AT 1d = £ 529.
" " " " 10d = £ 5290.

DESIGN HAS BEEN ENRICHED TO BRING COST UP TO LIMIT, VIZ. £ 8000.

127175 CUBIC FEET AT 1/3 £ 7925



·3RD FLOOR PLAN·



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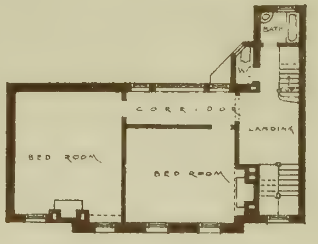

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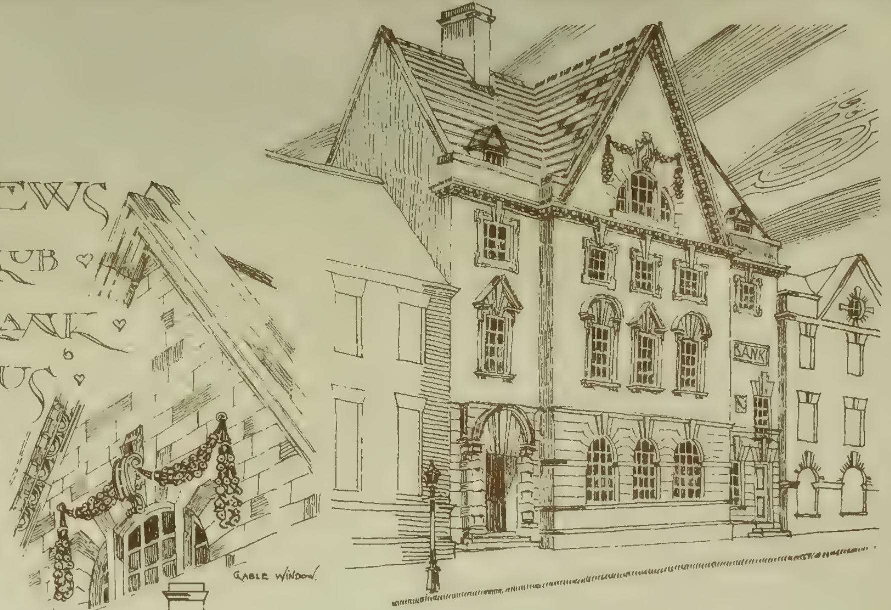
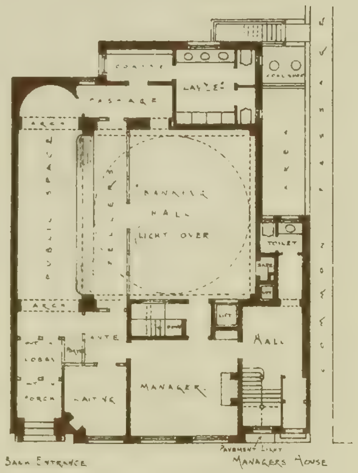
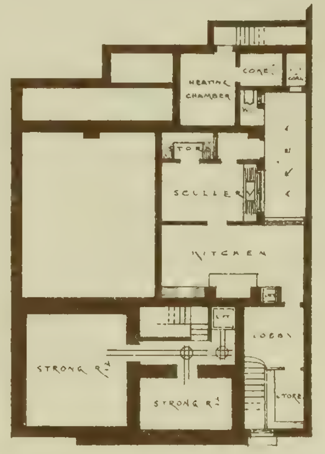


·VIEW·



·GROUND PLAN·



·BASEMENT PLAN·

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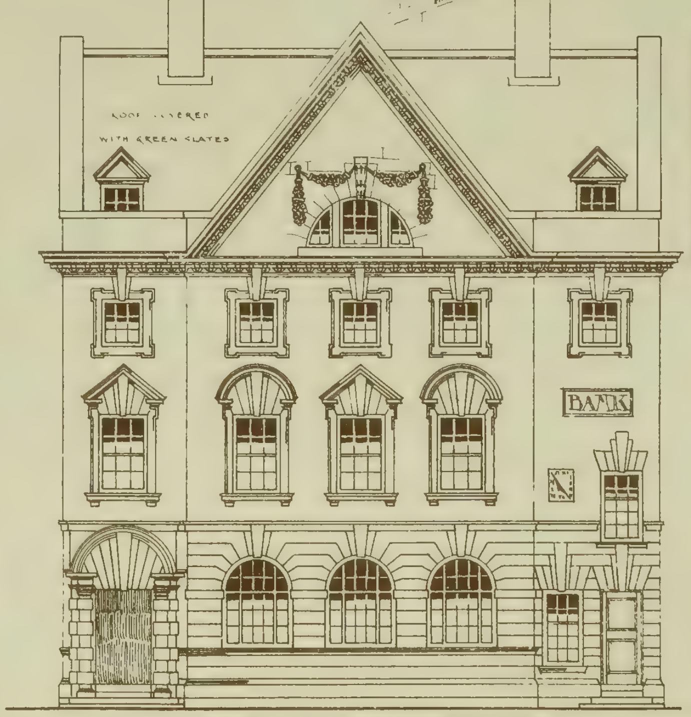
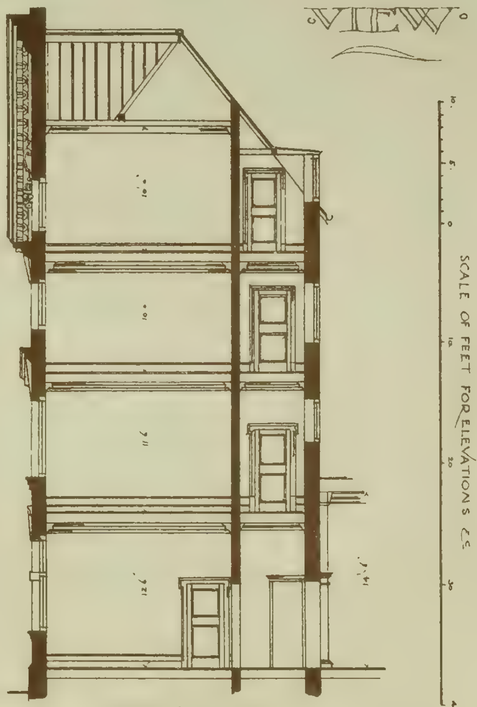
·SCALE OF FEET FOR PLANS·



·FRONT ELEVATION·



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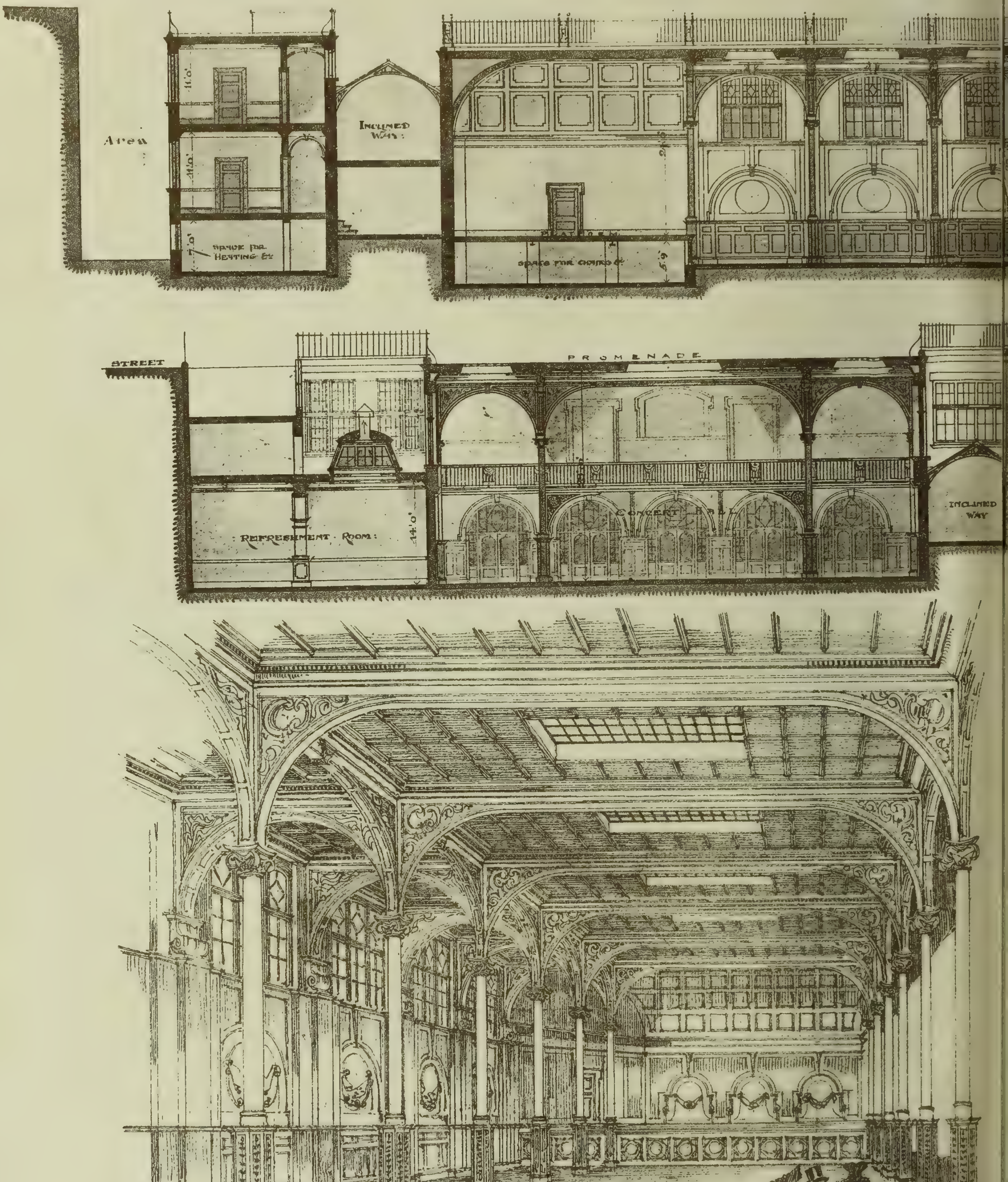
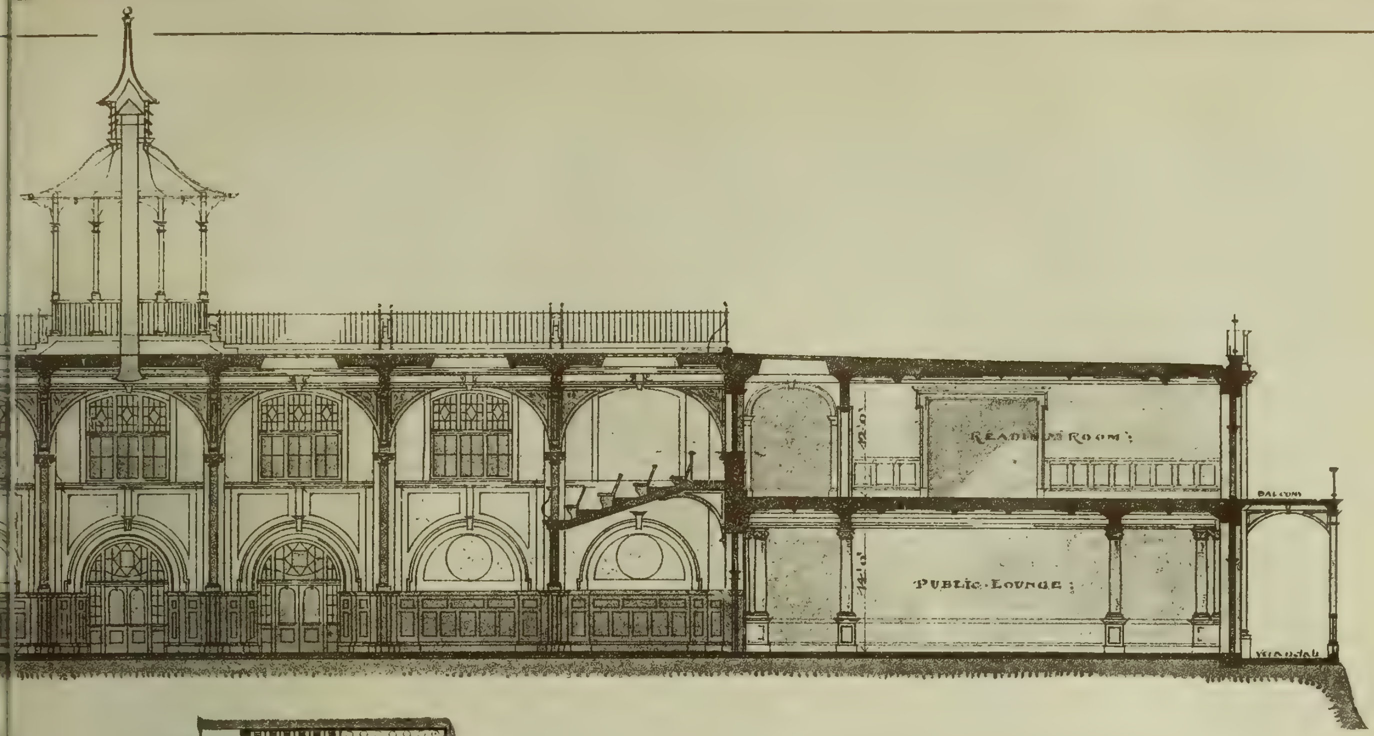
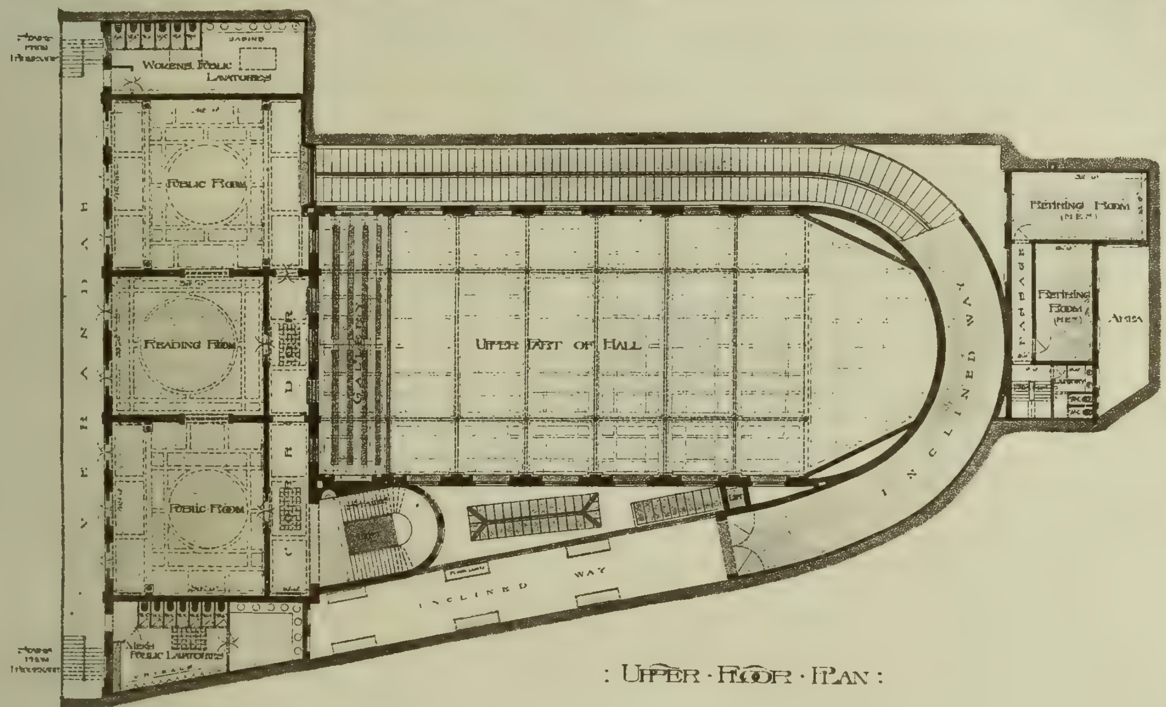


• RAMSGATE CONCERT HALL • FIRST PREM





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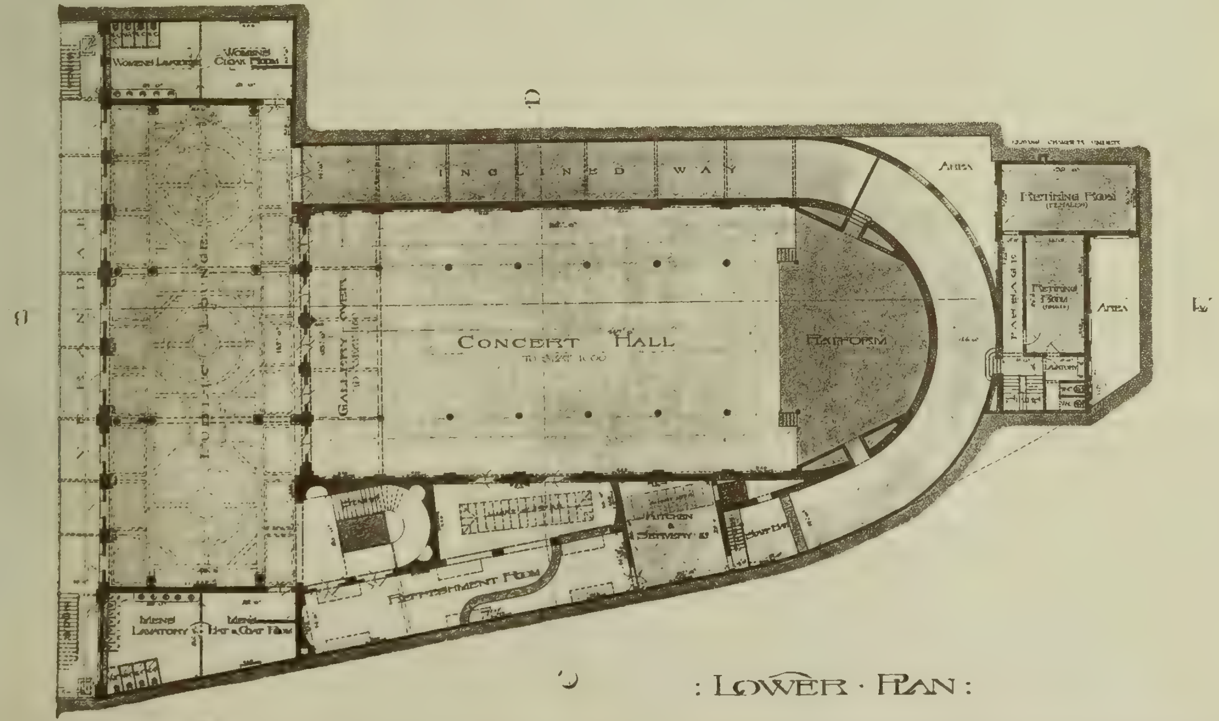


: LOWER · PLAN :

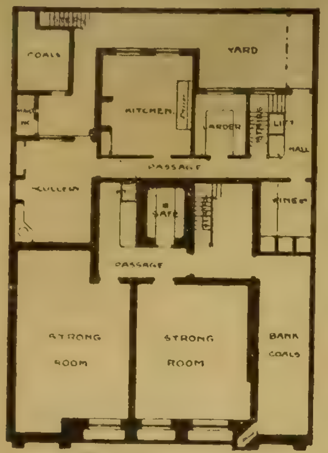
"PHOTO-TINT" by James Akerman 6 Queen Square London W.

ED DESIGN ARDRON · DAWSON AND HOWELL · ARCH^TS

"BUILDING NEWS DESIGNING CLUB" A BANK FOR A COUNTRY TOWN BY "ENGLISHMAN".

SCALE FOR PLANS

SCALE FOR ELEVATIONS



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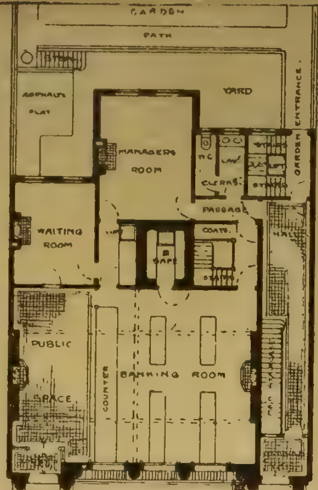
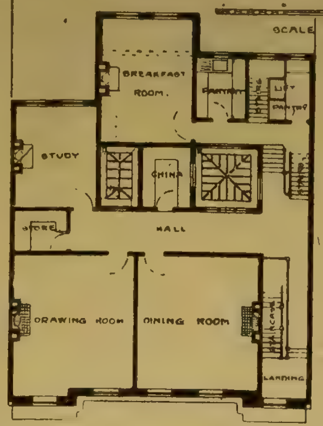
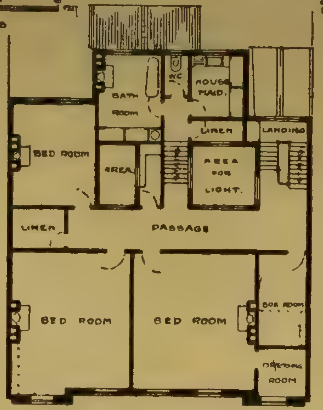


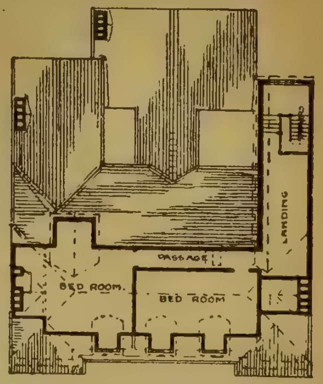
GROUND PLAN:



FIRST FLOOR PLAN.

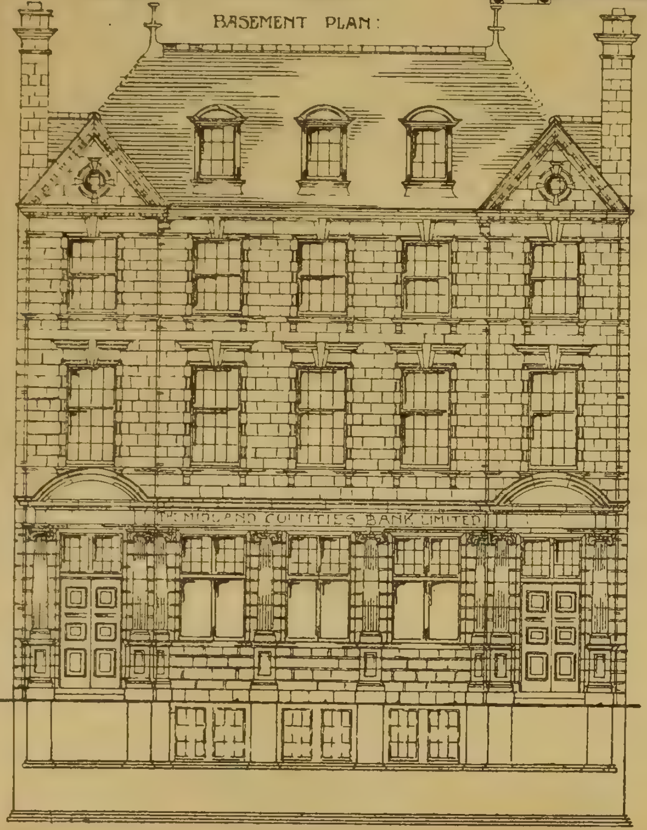


SECOND FLOOR PLAN:

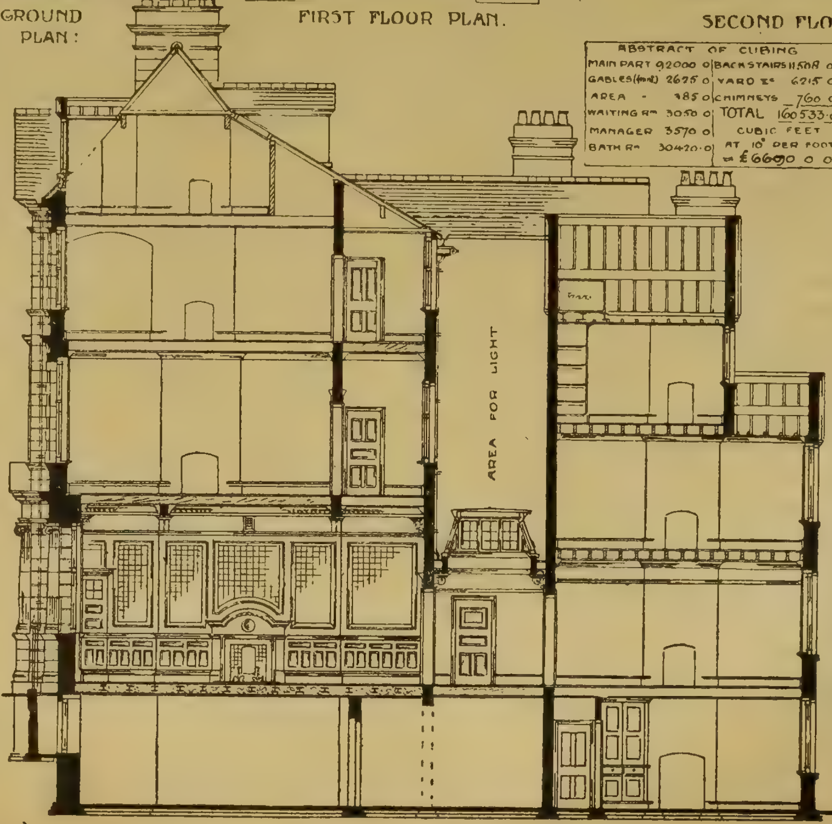


THIRD FLOOR PLAN:

ABSTRACT OF CUBING			
MAIN PART	92000 0	BACKSTAIRS	11508 0
GABLES (frnt)	2625 0	YARD &c	6215 0
AREA -	385 0	CHIMNEYS	760 0
WAITING Rm	3050 0	TOTAL	160533·0
MANAGER	3570 0	CUBIC FEET	
BATH Rm	30420·0	AT 10d PER FOOT	
		= £6690 0 0.	



FRONT ELEVATION:



SECTION:

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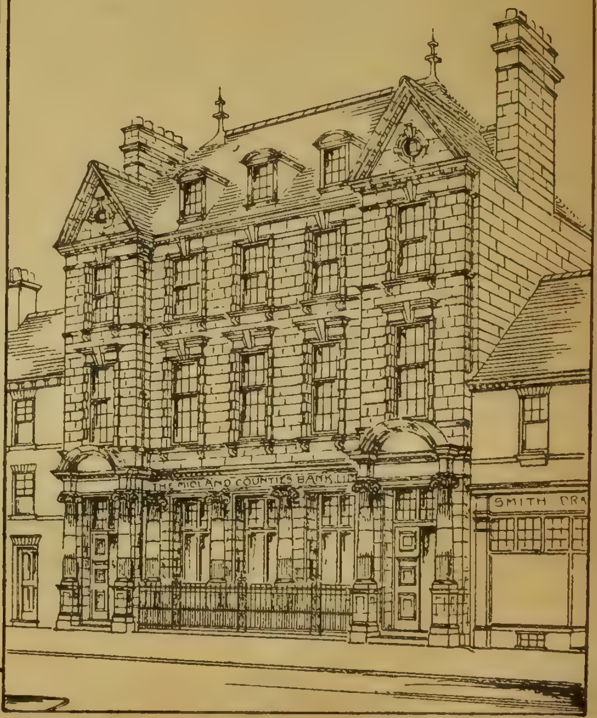
THE MIDLAND COUNTIES BANK LIM
SMITH

Intercommunication.

QUESTIONS.

[11377.]—**Concrete.**—I will be very much obliged if some of your able contributors will inform me if three measures of gravel to pass through a 1in. ring and one measure of sand to one of Portland cement is as good a concrete for a reservoir as three measures of broken stone to pass through a 1in. ring, and one measure of sand to one of Portland cement? I think I have read in the Building News that the gravel is the best.—Contractor.

[11378.]—**Incrustation on Marble-Tiled Floor.**—The marble-tiled floor of the chancel of our new church, opened in March, 1899, is causing much trouble by an incrustation which is formed upon its surface. No matter how frequently it is washed, the white deposit reappears. It probably comes from the cement in which the blocks are laid. Will any expert be so kind as to say if there is any way of getting rid of it, and what steps should be taken for that purpose?—H. B. N.

[11379.]—**Square or Cube Measurements in Quantities.**—Will any reader of the Building News inform me if there is a book published for ready-reckoning square and cube measurements in quantity work?—Quantities.

[11380.]—**Extras.**—Can A take proceedings to recover the amount of extra work over and above the contract without obtaining certificate from architect, who has not up to the present time given one, although it has been due for three months past?—Inquirer.

[11381.]—**Penalty.**—When an employer is determined to enforce the penalty clause in a building contract for non-completion of work to time, what is the duty of the architect? Has he any power to deduct the amount of the penalty when giving the final certificate, or must he give a certificate in full, and leave the employer to make the deduction? An answer from an architect who has had to face an unpleasant settlement of this sort, or from one who knows, will greatly oblige.—An Architect.

[11382.]—**Connection of Soil-Pipe and Drain.**—How should the soil-pipe be connected to drain? If of some weight it ought to be supported to prevent settlement and breaking the joint. I believe there are bands of iron sold made to support the soil-pipe. Also, what is the best kind of joint to connect with glazed stoneware trap?—A. Z.

[11383.]—**Graphic Means for obtaining Stress.**—Will anyone who knows tell me how the loads on, say, one-half of a roof-truss are taken and tabulated after the force diagram has been made? Supposing there are two points on each side of a truss beside at the ridge weighted with 2 tons each, there would therefore be 5 tons on each side. How should these be tabulated for the different stresses, and is the reaction at support taken into account? An explanation will be welcomed.—A Student.

[11384.]—**Surveying.**—Are there any good treatises on surveying showing the use of instruments and the mode of traverse surveying? I want a practical work; there are a great many written by theorists which do not explain points.—U. T.

[11385.]—**Sewage Discharge.**—Will someone kindly let me know is it known whether or not there is a certain depth (say, 30ft. and upwards) into which sewage can be discharged into the sea, which precludes the possibility of the sewage rising to the surface?—Sea Side.

[11386.]—**Articles of Pupil.**—Is this document usually prepared in duplicate? Where not so prepared, who should retain the executed copy until the term expires? When is the premium usually paid, if in one sum? What stamp duty is payable? Who pays the costs of preparing and stamping articles?—Parent.

REPLIES.

[11373.]—**Lead Soakers.**—To find the length of soaker for Countess slating having a 3in. lap (2in. lap over nail-hole, nail-hole 1in. from head of slate), deduct the gauge (8½in.) from the length (20in.), and add ¾in. for the clip. Some allow 1in. for clip, but I think it is rather too much. The same rule applies to slates of any dimension. For plain tiles perhaps 1in. for clip would be better.—D. Forbes Smith, Kirkcaldy.

[11373.]—**Lead Soakers.**—The rule is to make the lead soaker 1in. longer than the margin of slate plus the lap. A Countess slate is 20in. by 10in. If the margin is 8in., length of soaker would be 8in. + 1 + lap, or 12in.—G. H. G.

[11374.]—**Safe Load.**—See Longman's "Notes on Building Construction," Part IV. chapter xv., and appendix 20.—Regent's Park.

[11374.]—**Safe Load of Vault.**—The question will depend on height of side walls, not given. If of the ordinary height—say 8ft. to springing—the structure would carry the load on a base of 4ft. square, if the railway plates tie on the walls. The shape of arch is not the best, and should be tied at springing.—A. B.

[11375.]—**Steel Chimney Construction.**—"Factory's" queries are important, but not so easily answered. It is true that steel chimneys are superseding brick structures to a large extent, as they occupy less area in base and foundations; on the other hand, they require to be stayed by steel guys or wires. The circular plates are usually ¼in. in thickness, built up one plate at a time; the plates are riveted in *situ*, inside scaffold being used; each plate laps the other 2in. Steel chimneys can be quickly erected, and do not require soils of load-sustaining power. Steel chimneys are about 25 to 30 per cent more costly than brick, according to data. They can be lined with brick. For information, "Factory" should consult Mr. W. W. Christie's new work on "Chimney Design and Theory," published by Messrs. Spon, and reviewed in these pages.—G. H. G.

[11376.]—**Lead Cupola.**—The sheets should be as small as possible, with welted joints, but rolls may be used for the vertical joints if preferable, with horizontal welted joints. A great deal depends upon the size of cupola; solder dots may be necessary to prevent the lead from leaving the boarding.—D. Forbes Smith, Kirkcaldy.

CHIPS.

At a meeting held at Wrexham to consider the proposed restoration of the noble Perpendicular parish church, towards which the late Mr. William Overton left £500, it was announced that the Duke of Westminster would give £1,000 this year, and another £1,000 next year. Other donations amounting to between £700 and £800 were promised in the room.

A new free library for North Dublin has just been opened at Charleville Mall, close to Newcomen Bridge. It has been erected by the contractors, Messrs. Joseph Pemberton and Son, of Charlemont-street, Dublin, under the personal supervision of the city architect, Mr. C. J. M'Carthy, who prepared the plans.

The death is announced in his 65th year of Mr. John Roberts, builder, of Rhyl. The late Mr. Roberts, at one time, was engaged in extensive building operations in Rhyl, and erected considerable property there. For many years he was a member of the old Board of Commissioners, and took an active interest in its work. He also identified himself with local musical circles.

Mr. H. H. Law, one of the Local Government Board inspectors, held an inquiry at Atherton on Nov. 30 into the urban district council's application to borrow £1,500 for works of water supply.

Although last week's sales at Tokenhouse-yard were not so heavy as in previous years, yet a satisfactory total was arrived at, first-class investments still maintaining high prices. An important feature of the week was the letting on building leases for 80 years of several sites close to Fenchurch-street Station, comprising some 16,990 superficial feet, which produced £3,310 per annum. The total amount of the week's sales was £104,626, which is £112,363 less than the total for the corresponding week of last year, when, however, some first-class West-end investments were in the market.

Col. Luard, C.E., one of the inspectors of the Local Government Board, held an inquiry on Nov. 29 at the Council House, Bristol, relative to an application to the board to sanction the borrowing of £16,000 for purposes of wood pavement, and for permission to dispose of certain corporation property in St. George's-road to Messrs. Fuller and Co. Another inquiry was held at Bristol on Tuesday last for the purpose of obtaining permission to borrow £15,300 for land for electric lighting, £13,418 for baths, £11,745 for the Cheltenham-road library, £6,352 for the provision of depots in various centres, and £155 for street improvement purposes.

The tower of the parish church of Strood, by Rochester, which was destroyed by fire last December, has now been restored, and a new peal of bells and a clock have been added. The restoration has been carried out at a cost of £2,000. The restored portions were dedicated on Wednesday week by the Bishop of the diocese.

At East Allington, Devon, a new font with cover has just been dedicated as a memorial to the late Rev. H. R. Fortescue. It is Early English in style. The base and footpace are of Ashburton marble. Five circular and detached columns of red Devon marble carry the bowl, which is of mottled Staffordshire alabaster. The sculpture in the panels around the bowl is in white Castellini marble. The four sculptured figures are seated ones in recessed panels and represent Noah, Moses, Elijah, and St. John the Baptist. The work has been carried out by Messrs. Harry Hems and Sons, of Exeter.

The stained-glass window recently presented to Dovercourt parish church by the German Emperor is now *in situ*. The window represents the Healing of the Centurion's Servant. Each light is surmounted by the Prussian eagle in different colouring, and in the centre tracery piece above is the Imperial crown with "W. II." beneath it. At the church are also to be seen the lych-gate presented by the Queen, and the graves where lie buried the British and German soldiers who died at Dovercourt from disease contracted during the Walcheren Expedition in 1809-10.

At a meeting of the Cambridge Town Council, held a fortnight ago, it was resolved to acquire the University and Town Waterworks by a majority; but it was afterwards ascertained that the majority was not sufficient to satisfy the requirements of the Act of Parliament. The matter was referred to the council's Parliamentary agents, who advised that the vote should be taken again, and a special meeting has accordingly been held, when the vote was carried by 25 to 17.

The health committee of the corporation of Liverpool have authorised the city engineer (Mr. J. A. Brodie) to advertise for an assistant engineer, as a successor to the late Mr. J. M. Morgan, at a salary of £300, rising by £25 per annum to £350.

WATER SUPPLY AND SANITARY MATTERS.

Edinburgh.—At the last meeting of the works committee of the Edinburgh and District Water Trust, the new tenders for No. 3 contract of the Talla works, which was held by James Young and Sons, for the construction of the reservoir were opened. They were thirteen in number, and were sent by various contractors in England and Scotland. It was agreed that six of them should be remitted to the engineer for examination and report before the final selection is made. All the tenders are considerably in excess of the amount of Messrs. Young and Son's contract, this being largely due to the increased price of labour and materials. The original contract was for £163,000, and although work to the extent of £54,000 of that contract has already been completed, the tenders now submitted are even higher than the first contract, and it is quite probable that the final cost of the works may exceed the original estimate by £50,000.

Dalkeith.—The question of the water supply, which has been causing much interest in the Dalkeith district, has assumed a new phase on the decision of the Dalkeith Burgh Commissioners to have the underground piping examined in order to discover exactly as to the extraordinary statement of a Dalkeith plumber lately communicated to them that about 18,000 gallons of water per day had been running to waste into a main sewer drain from an old lead pipe which had not been closed when a public well was removed over two years ago. As something like 13,000,000 gallons of water would thus have run to waste in the period alluded to, the committee of the water arragements felt compelled to seriously go into the question. Complete examination was made on Friday, and the members were generally agreed as to the result of their investigations that the plumber's statement as to the great quantity of water having run to waste was unfounded. The whole question of an additional supply of water will now be considered by the Commissioners.

New South London Intercepting Sewer.—The Main Drainage Committee of the London County Council reported on Tuesday that they had received deputations from the vestries of Battersea, Camberwell, Lambeth, Newington, Rotherhithe, and St. George-the-Martyr, Southwark, and the St. Olave and Wandsworth District Boards on the subject of the necessity for constructing additional outfall and intercepting sewers for the drainage of London. "All the deputations," observe the committee, "not only expressed their approval of the proposals which we have laid before the council for providing more sewer accommodation, but also urged the extreme importance of at once proceeding with the construction of the suggested new intercepting sewer between Deptford and Battersea, so that the outfall sewer recommended in our report, and the intercepting sewer approved by us, but not recommended for the time being, may be constructed simultaneously. We have informed the council that the work of constructing the new outfall sewers proposed will last for about eight years, while the construction of the intercepting sewers will probably take six more years to complete. The several deputations, having referred to the inadequacy of the main sewers in their respective districts, strongly expressed the view that its was absolutely necessary that the relief which it is anticipated will be afforded by the formation of the new sewers should be given long before the time contemplated, and that all the works included in the scheme should be completed within a period of six or seven years. It will be remembered that the cost of the new sewer from Deptford to Battersea is estimated roughly at £300,000."

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At Skipton, a new Diamond Jubilee cottage hospital has just been opened. It is Domestic in style, accommodates 13 patients and four nurses, and has cost £2,740. The architect is Mr. Edward C. H. Maidman, of Edinburgh.

The opening of the new Wesleyan chapel just erected in Long-street, Devizes, to replace the ancient and obsolete structure in New Park-street, took place on Friday. The new building is in the Geometric Gothic style. It provides accommodation for 700 worshippers, and has a schoolroom and classrooms in rear. The total cost, including site, was £4,000.

A new pumping-engine was opened on Friday at the St. Alban's Waterworks capable of raising 1,500gals. of water per minute. With the 600,000 gallons a day produced at the upper works, there is provided a water-supply which amounts to six times the maximum quantity required by the city, with a pumping capacity of three times the amount. The engine has been built according to plans and specifications prepared by Mr. A. F. Phillips, M.I.C.E., by Messrs. Simpson and Co., of Pimlico, the boring having been accomplished by Messrs. Le Grand and Sutcliffe, of London, and Messrs. Miskin and Son have enlarged the building.

LEGAL INTELLIGENCE.

Public-Houses and the London Building Act.—Ex Parte the London County Council.—In the Queen's Bench Division, on Friday, before Mr. Justice Bruce and Mr. Justice Bigham, Mr. Avory moved for a rule *nisi* calling upon the magistrate of the Westminster Police-court to show cause why he should not state a case raising a point which the County Council desired should be raised under the London Building Act, 1894. Section 74 (2) of the Act provides as follows:—"In every building exceeding ten squares in area used in part for purposes of trade or manufacture and in part as a dwelling-house, the part used for purposes of trade or manufacture shall be separated from the part used as a dwelling-house by walls and floors constructed of fire-resisting materials, and all passages, staircases, and other means of approach to the part used as a dwelling-house shall be constructed throughout of fire-resisting materials." A building-owner gave notice to the district surveyor of his intention to erect a public-house, the ground floor of which was to be used for the public-house, and the first and second floors for residential purposes. A notice of objection that the building was not in accordance with section 74 (2) of the Act was served upon the building-owner under section 150, from which notice the building-owner appealed to the magistrate. It was contended by the Council that the proposed building was one "used in part for purposes of trade" and "in part as a dwelling-house" within section 74 (2), and that the requirements of that section must accordingly be complied with. The magistrate allowed the appeal, refusing to state a case on the point raised by the Council on the ground that it was decided in "Carritt v. Godson" (1899, 2 Q.B., 193), where Mr. Justices Day and Lawrance held that a fully-licensed house was not within the section. The learned counsel pointed out that in "Carritt v. Godson" the proceedings were criminal, and consequently the case could not be taken to the Court of Appeal. The present proceedings were not criminal, and the Council desired to obtain the opinion of the Court of Appeal upon the point. A rule *nisi* was granted.

In re J. H. Scaife, of Hull.—A meeting of the creditors of John Henry Scaife, 250, Division-road and West Dock-avenue, Hull, joiner and builder, was held on Nov. 28. Debtor's gross liabilities were returned at £1,979 16s. 5d., of which £249 16s. 8d. is expected to rank for dividend. His free assets are £195 6s. 6d., leaving a deficiency of £54 10s. 2d. The assets include £142 2s. 3d., surplus from securities in the hands of fully-secured creditors; but the Official Receiver (Mr. A. S. Maples) expressed the opinion that the surplus would not be so large. The debtor, who attributes his failure to want of capital, commenced business in October, 1897, without any capital in cash, but possessed two houses, a workshop, and stable in West Dock-avenue, worth about £700. He commenced in partnership with Mr. Charles Hall, under the style of "Scaife and Hall, Joiners and Undertakers." The partnership, however, only lasted about nine months, when it was dissolved by mutual consent, the debtor taking over all the assets and liabilities. The whole of the debtor's unsecured liabilities are for goods supplied. The matter was left in the hands of the Official Receiver.

Leeds Arbitrations.—Sir Hugh Owen, G.C.B., of the Local Government Board, again sat at the Leeds Town Hall last week to assess the amount to be paid by the Corporation for the compulsory acquisition of several lots of property in the York-street insanitary area. In the first case, Mr. Thomas Whittaker claimed £150 in respect of a small piece of property in Off-street, adjoining the North-Eastern Railway. The Corporation, for whom Mr. A. W. Bairstow appeared, had offered £60. Mr. Thomas Winn, architect and surveyor, was the principal witness for the claimant, and his valuation was £121. On behalf of the Corporation, Mr. J. M. Fawcett, architect and valuer, put the value at £58 10s., and Mr. W. S. Braithwaite, architect, at £55 16s. Evidence as to repairs was also given by Mr. C. Myers, builder and valuer. The arbitrator next inquired into the claim of the trustees of Mrs. Stallworthy in regard to the scheduled property in the Rising Sun Yard, off Marsh-lane. The trustee had formally asked for £450, and the Corporation made an offer of £225. Mr. J. W. Heeles, estate agent, who was called on behalf of the claimants, gave a valuation of £379, and Mr. S. Whitham £393 19s. 8d. For the Corporation Mr. J.M. Fawcett estimated the value to be £230 15s., and Mr. E. S. Silcock, surveyor, £243. The arbitration proceedings for the present terminated, and in due course Sir Hugh Owen will make his awards.

Damages for Extraordinary Traffic.—The Dunfermline District Committee of the Fife County Council raised an action in the Dunfermline Sheriff Court against Baird and Stevenson, quarrymasters, Glasgow, for payment of £2,372 2s. 7d. The defenders are the lessees of Callalo quarry, near Aberdour, and the pursuers averred that they had incurred expense to the amount sued for in repairing a road used by the defenders, this expense being incurred by reason of the damage caused by excessive weight passing along the road or by extraordinary traffic upon it. The defenders tendered £59 5s. 10d., being a proportionate sum to that already awarded by the Court according to the quantity of stones carried over the road in question, or, alternatively, £76 11s. 3d., being at the rate of one penny per ton per mile, which, but for the pursuers' culpable neglect of the road, the defenders said, would have been sufficient to meet the extraordinary expense occasioned by their traffic. The pursuers, it was further stated by the defenders, closed the road for about twelve weeks, and reconstructed it, and it was contended that, under the statute, the defenders were not liable for the cost of reconstruction, which was not maintenance. On the other hand, the pursuers said that they maintained the road in a manner quite fit for the ordinary traffic of the road and also for the defenders' traffic so long as it was conducted in carts and a lorry, but the defenders, without giving notice to the pursuers, began to conduct their traffic with a traction-engine and waggons, which were of great weight, and unfitted for any road unless specially prepared for such traffic. A long proof was led, and Sheriff Gillespie has now issued an interlocutor, awarding the pursuers £1,200, payable in four quarterly instalments, with expenses.

A Costly Claim for Dilapidations.—In the Queen's Bench Division, on Saturday, Mr. Justice Bruce had before him the case of Rogers and another v. Bell, which was an action brought by trustees against a tenant to recover £46 19s. 10d. in respect of dilapidations. In January, 1890, the defendant took a house of a lady, now deceased, on a yearly tenancy, and covenanted to keep it in repair, receiving an allowance of £10 per year for the purpose. When the defendant delivered up the house the plaintiffs, as trustees of the estate, made a claim for dilapidations to the extent of £46 19s. 10d. Defendant refused to pay, and the plaintiff brought an action to recover the amount. The case came on for trial at the Chester Assizes, and was referred to a Liverpool architect, who found that the repairs for which the defendant was liable under the covenant would not cost more than £4 5s. As the defendant had paid £5 into court, Mr. Tudor Howell now applied that judgment should be entered for the defendant, with the costs of the action, reference, and of the present action. Mr. Trevor Lloyd, for the plaintiffs, appealed to his Lordship not to mulct the estate in costs. The estate was a small one, and the tenant for life had to keep her father and herself on the income. It would be a serious thing if she had to pay the defendant's costs. Mr. Justice Bruce said the case ought never to have been brought into the High Court. As the plaintiffs did not accept the £5 which was paid into court, the defendant would have judgment, with the costs of the action, the inquiry by the architect, and of the present application.

W. G. Sutherland, Ltd.—A meeting of the shareholders of the above company was held on Monday at the registered offices of the company, No. 16, Oxford-street, Manchester, when the following extraordinary resolutions were adopted and duly passed:—"(1) That it has been proved to the satisfaction of this meeting that the company cannot, by reason of its liabilities, continue its business, and that it is advisable to wind up the same, and accordingly that the company be wound up voluntarily; (2) that James Royal Hesketh, of 22, Brazennose-street, Manchester, chartered accountant, be, and is, hereby appointed liquidator for the purposes of such winding up. A statement of affairs is now being prepared, and will be sent to you in due course."

A Bristol Arbitration.—On October 18, Mr. Robert Vigors opened in Bristol the arbitration proceedings between the Corporation of Bristol and Sir Greville Smyth, Bart., as to the price to be paid by the former for land at Ashton Meadows required for the purposes of the Bristol Dock Act, 1897. The land in question is about 26 acres in extent, and lies between Clifton Bridge Station and Colliter's Brook. Mr. W. Sturge had been the arbitrator for the corporation and Mr. R. Forrest for Sir Greville Smyth, and these gentlemen having been unable to agree, Mr. Vigors was called in as umpire. Mr. Freeman, Q.C., and the Hon A. Lyttelton, M.P. (instructed by the deputy-town clerk) were counsel for the corporation, and Mr. C. A. Cripps, Q.C., M.P., Mr. E. Boyle, Q.C., and Mr. Holman Gregory (instructed by Messrs. Wansey and Son) appeared for Sir Greville Smyth. After the proceedings in Bristol, on October 18 there was an adjournment to November 10, when the inquiry was resumed in London. Mr. Vigors's award in the matter was received on Saturday, and the amount to be paid to Sir Greville Smyth has been fixed at £26,983. The claim was for £65,000, and the corporation had offered £25,000.

Settlement of the Limpsfield Building Dispute.—The case of Leveson-Gower v. Sewell on Wednesday came before the Court of Appeal, composed of the Master of the Rolls, the President of the Probate Division, and Lord Justice Roman, on an appeal by the defendant from an interlocutory injunction granted by Mr. Justice Darling in the Vacation Court, restraining the defendant from building on an estate at Limpsfield in Surrey, except in accordance with plans, which had been approved by the plaintiff's architect, Mr. Stenning. The case was fully reported in the Building News of Oct. 14, 1899. Upon the case being called on Mr. Alexander, Q C., who appeared in support of the appeal, said that their lordships would remember that the motion was in the list of hearing about five weeks ago, but then was ordered to stand over in order that it might be seen whether a compromise could be effected between the parties. He was glad to be able now to say that a compromise had been effected, and that fresh plans had been prepared which had been approved by the plaintiff's architect, and that defendant had undertaken that his building should be in accordance with those plans. It had also been arranged that the defendant should pay to the plaintiff £80 towards his costs. The Master of the Rolls said that he thought this arrangement was a very satisfactory one. Mr. Alexander said he proposed to take an order to the effect that upon the defendant undertaking to build in accordance with the plans which had been approved by the plaintiff's architect, and to pay £80 towards the plaintiff's costs, the appeal should be dismissed without costs, and that further proceedings in the action should be stayed. Mr. Milligan, Q.C., for the plaintiff, agreed to this, and an order was made accordingly.

Builder Threatens an Architect.—At the Maidenhead Police-court on Monday last, Mr. Thomas Martin, builder, of Boyn Hill, was summoned on the information of Mr. Edward James Shrewsbury, architect and surveyor, of Queen-street Chambers, Queen-street, Manchester, who alleged that on November 20, in this borough, defendant used certain offensive words to him, which reflected on his character, and were such as were calculated to provoke a breach of the peace. Plaintiff's counsel stated that in March, 1896, a receiving order in bankruptcy was made against defendant, who, during his public examination, suggested that his failure was due to Mr. Shrewsbury having, as architect, improperly withheld certificates which were due in respect of work done, and whereby the defendant was prevented obtaining sums of money which he thought were due to himself. This had led to the systematic abuse by Mr. Martin of Mr. Shrewsbury whenever they came into contact with each other. Evidence having been given in support of the case, defendant was called, and said it was not his intention to assault plaintiff. The magistrate said that it was their unanimous opinion that he should be bound over to keep the peace for twelve months, in the sum of £100, and he would have to find two sureties in £50 each.

A Building Dispute.—Grimstead v. Small.—At the town-hall, Chard, on three days of last week, Mr. E. J. Pollock, as official referee appointed by the High Court of Justice, sat to hear the case of Grimstead v. Small, remitted from the Queen's Bench Division. The plaintiff, William Grimstead, builder, of Tytherleigh, Chard, sued the defendant, John Charles Small, manufacturer, of Perry-street Works, Chard, for £364 4s., monies alleged to be due from defendant under contracts between them, for damages for breaches of contract, and for the price of work and labour done and materials provided by plaintiff at defendant's request. The claim had reference to the building of cottages, making a roadway and drains, and completing cottages at Perry-street and Knapp Mills, near Chard. The defendant paid £210 into Court, whilst denying all liability. In a counter-claim defendant asked for damages against plaintiff for not completing certain work, and negligently laying drains; for £39 12s. 6d., the cost of erecting porches to cottages which it was alleged plaintiff should have constructed under his contract; £12 10s. for building plant alleged to have been detained by plaintiff; and £10 the amount of damages suffered by defendant because plaintiff neglected to use certain mortar, nails, and paint in his work. The plaintiff was called, and he proved carrying out various building and draining work for defendant at Perry-street and Knapp Mills. Whilst engaged at the latter place defendant came up one day and said that Hill (his clerk) was getting "too thick" with witness. A day or two afterwards he received a letter from Mr. Small calling upon him to return the plans and specifications relating to the work in progress at Knapp Mills. Witness was bound to discontinue his work for defendant because the latter stopped the supply of mortar which he had agreed to provide. Arthur William Yeomans, architect, of Chard, proved drawing the plans for the cottages to which defendant had since added porches. The porches were not shown on the plans, and it would be most unusual to include in a contract work not shown on the plans. The defendant said that whilst plaintiff was carrying out his contracts he was informed that materials, including mortar, were being sent to the building sites in excess of immediate requirements. He spoke to the plaintiff on the subject, and told him he would not allow it. Witness also accused plaintiff of having used his (witness's) mortar on work where he had no right to use it, and also of taking various things which belonged to witness. Defendant said he was sorry for what he had done, but witness told him he would have to apologise in writing. In cross-examination, defendant said before the houses were built plaintiff had agreed to erect the porches, but they were not marked on the plans. The porches and other work had been erected by a Nottingham builder, and witness had had an action brought against him at Nottingham Assizes to recover the sum due. He paid the claim and all costs before the action came on for hearing, because he was advised that an architect having given a certificate that the work had been satisfactorily done he would have to pay the builder in any event. He had commenced an action against the architect, and it was now pending. Alexander Poole, builder, of Ilminster, stated that the drains at Perry-street laid by plaintiff had not been properly constructed, and they were not put in sufficiently deep. John Madge, architect, of Chard, corroborated. Further evidence for the defence was given by Edmund James Symes, architect, of Chard. On behalf of plaintiff, George Alexander Thomas Middleton, A.R.I.B.A., M.S.A., Craven-street, Strand, W.C., stated he estimated the work left undone by Grimstead at about £9, and he valued the mortar used wrongly at £2. The Referee said he would deliver his judgment in London on December 9.

Value of a Building Site in Hoxton.—Mr. Balfour-Browne, Q.C., who, in the capacity of umpire, recently held an inquiry into the value of certain building land in Shepherdess-walk, Hoxton, required by the Receiver of Police for the erection of a new police-station, has issued his award. The claimant was Mr. Bromet, who is the lessee under the Charity Commissioners of a large area of land fronting Shepherdess-walk and Nile-street at a ground rent of £3,350 per annum, with the condition that the buildings to be erected on the land should be of the annual rental value of five times that sum. In March, 1898, the Receiver of Police obtained an Act of Parliament in which was embodied an order made by the Secretary of State for the acquirement of a portion of the property, containing an area of 39,076ft., and notice to treat was served upon Mr. Bromet in the same year. The ground rent of this area was apportioned at £895, and a large sum, varying from £16,000 to £21,000, was claimed as the difference between the value of the land as originally laid out and its value as it could be developed without the portion acquired. Mr. Balfour-Browne has assessed the value at £8,375, which figure represents about half the amount suggested on behalf of the claimant.

A Dewsbury Arbitration Case.—An arbitration case has been determined at Dewsbury. The parties to it were Messrs. Bever and Dorling, engineers and ironfounders, and Mr. G. A. Fox, architect, with Mr. Arthur Marriott, surveyor, &c., as umpire. All belong to Dewsbury. The firm named claimed damages in respect to lights, and through the fall of one of their warehouses caused by weakening the foundation when Mr. Fox was having dug the cellaring of some shops he is erecting in Corporation-street and Northgate. Messrs. Bever and Dorling have been awarded £175 damages, Mr. Fox to pay costs in addition.

Wakefield City Council Fined £100.—At the Wakefield County-court, on Tuesday, Mr. Hudson, town clerk of Wakefield, applied on behalf of the corporation for a further extension of the time allowed them in which to complete their sewerage works. Mr. Trevor Edwards, the West Riding solicitor, opposed the application, and asked his Honour to enforce an order against the corporation for polluting the river Calder. He said the county council had no vindictive feeling against the city council; but there had already been extensions of time, and reasonable diligence had not been exercised by the corporation. The town clerk said that, owing to the activity in the iron trade and other unforeseen circumstances, the contractors had been delayed, and found it impossible to complete the work in the time allowed. Mr. Edwards asked for a penalty to be inflicted, and his Honour ordered the corporation to pay £100, the penalty not to be enforced if the work be completed and the nuisance abated within three months.

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A portrait of Dr. Collins, who was chairman of the London County Council in 1897, has been placed in the lobby of the County Hall, Spring-gardens. The portrait, by Professor Herkomer, R.A., has been presented by 103 of Dr. Collins's colleagues.

The Institution of Electrical Engineers held their annual dinner on Wednesday evening in the Hotel Cecil, Professor Silvanus Thompson in the chair. Among those who took part in the proceedings were General Sir R. Harrison, Inspector-General of Fortifications, Lord Kelvin, and Sir W. C. Roberts-Austen, President of the Iron and Steel Institute.

Our Office Table.

It is stated that the National and other public collections will benefit greatly by the bequests of the late Mr. Henry Vaughan, the donor some years since of Constable's "Hay Wain" to the National Gallery, who died last week in his 91st year. Mr. Vaughan's oil-pictures will probably be offered to the National Gallery, which is likely to receive also those few sepia preparations for the prints of Turner's "Liber Studorium," which were his property. The British Museum print-room will be enriched with a series of more or less progressive engravers' proofs of the "Liber"—of great rarity—and with certain drawings by Old Masters. The Turner water-colours which Mr. Vaughan owned, and which were among the finest features of his cabinets, are to become the ornaments of the museums of Dublin and Edinburgh, their late possessor having entertained strong views as to the measures necessary for their conservation, and having laid down some stringent conditions which must be followed. The *objets d'art* and carvings, including a noble "relief" which has been attributed to Donatello, will pass into the keeping of the authorities at South Kensington.

The total number of plans and other documents deposited at the Private Bill office in connection with local Bills in promotion for the ensuing session of Parliament shows an increase of 56 on those deposited in 1898. The deposits for the session of 1900 are: railways 50, tramways 32, miscellaneous 97, general provisional orders 133, and electric lighting provisional orders 109—a total of 421. Among the deposits are the following: L.C.C. Water (Welsh Supply); L.C.C. Improvements; London and N. Western Railway; Midland Railway; London and South-Western Railway; London, Brighton, and S.C. Railway (Various Powers); Baker-street and Waterloo Railway (extensions to Elephant and Castle and to Paddington); Purfleet and Gravesend Junction Railway; South-Eastern Metropolitan Tramways; Reading Corporation Tramways; National Markets and Stores and Workshops; Charing Cross and Strand Electricity Supply Corporation; South Essex Water Board; Post Office (Requisition of Sites); North Metropolitan Electric Power Supply; City of London (Various Powers); Mid-Kent Water; East London Water; Housing of the Working Classes Act (1890); London (Webber-row and Wellington-place and King's Bench-walk, Southwark) Improvement Scheme (Prov. Order); London (Garden-row, Roby-street, Baltic-street, and Honduras-street, St. Luke) Improvement Scheme (Prov. Order), and two other London schemes under the same Act; S.E. and L.C. and D. Railways; Lambeth Water; L.C.C. (General Powers); L.C.C. Spitalfields Market; Rotherhithe and Ratcliffe Tunnel, L.C.C.; and London County Tramways.

Some idea of the magnitude of the London scheme for obtaining a supply of water from Mid-Wales may be gathered from the book of plans and sections prepared in connection with the London County Council's Bill for next session. The volume is of great size, consisting of 864 pages, and deals with many thousands of different properties. The area of land within the limits of deviation is 29,232 acres, the whole of which has been surveyed in detail. The main aqueduct to London is to be 162 miles long, but to comply with the Standing Orders of Parliament 276 miles of section have had to be deposited. The plans and sections have only been completed in time by the most assiduous efforts, the work having been carried on literally day and night.

The Church of St. Michael's, Bassishaw, which was condemned and closed over six years ago on the ground that the structure was insecure, and, consequently, a danger to the public, was sold by auction on Tuesday, Messrs. Horne and Co., acting on the instructions of the Ecclesiastical Commissioners, submitting the different parts of the bare building for public competition. Devoid of any striking architectural feature, the church has more than ordinary interest to the archæologist. Its history as a place of worship dates back as far as 1140, and it was one of the nineteen churches for the design and building of which Sir Christopher Wren was responsible. Under the Union of Benefices Act the church is to be demolished, hence the sale of the materials. The auctioneers put up the building in some twenty-five lots. Although bidding was brisk, the initial prices offered were small, the total proceeds of the different lots yielding £198. Two lots, comprising the brick and stonework of the church and tower, failed to find a purchaser, and were withdrawn. The most valuable lot was the lead covering the steeple, gutters, and other parts of the building, which was not knocked down until the substantial figure of £180 had been reached. Included in the other lots were the weather-vane, which realised £2 15s.; eight ornamental stained-glass windows, which fetched £2 5s.; and a large pile of hassocks and a stack of matting, which found a purchaser at £1 9s.

An Order in Council is published in Tuesday's *London Gazette* modifying the Order in Council of July 18, 1898, relating to the Land Transfer Act, 1897. It is ordered that, as regards the following portions of the County of London, the days on and after which registration of title to land is compulsory on sale are postponed to the dates mentioned below:—The parishes of Christ Church (Southwark), St. George the Martyr, Camberwell, Horselydown, Lambeth, Bermondsey, Newington, Rotherhithe, St. Olave and St. Thomas, St. Saviour and the detached part of the parish of Streatham situate between the parishes of Lambeth and Camberwell to January 1, 1900; the parishes of Battersea, Clapham, Putney, Tooting Graveney, Wandsworth, and the remainder of the parish of Streatham to May 1, 1900; the remainder of the County except the City of London to November 1, 1900; and the City of London to May 1, 1901.

With regard to the ancient gateway, now preserved in the Victoria Embankment Gardens, and commonly known as the York Watergate, a suggestion has been made that it would be desirable to affix to it a tablet, with an inscription, giving shortly the particulars of the erection of the gate and the purpose it served. Accordingly the Park Committee of the London County Council will ask the Council for sanction to affix an oak tablet bearing the following inscription:—"This gateway, formerly the watergate or approach from the Thames to York House, Charing-cross, originally the London lodging of the Archbishop of York, the birthplace of Chancellor Bacon, and afterwards the residence of George Villiers, second Duke of Buckingham, was designed by Inigo Jones, architect (1572-1652), and executed between 1624-1628 by Nicholas Stone, master mason (1586-1647), for the first Duke of Buckingham, and marks the river margin before the embankment was constructed. The inscription on the north frieze "Fidei coticula Crux" (the Cross is the touchstone of faith) is the motto of the Villiers family, whose arms are on the south front. By the London Open Spaces Act, 1898, the gateway was vested in the London County Council, who repaired the structure and took measures for its preservation *in situ* as an interesting landmark of London."

The scheme for connecting Manchester and Liverpool by means of a high-speed railway on the mono-rail system is rapidly taking definite shape, and during the next Session of Parliament a Bill will be introduced for the construction of the line. The various plans and papers have been deposited, and as soon as the Bill has been got through Parliament the actual construction of the line will be commenced. The engineers of the railway, the motive power of which will be electricity, are Mr. John Hawkshaw, a member of the council of the Institution of Civil Engineers, and Mr. F. B. Behr, Assoc.Inst.C.E. The idea of a lightning express railway at 100 miles an hour between the two great cities has been warmly supported by the prominent citizens of Manchester and Liverpool.

Electrolysis of water-mains has been studied recently at Richmond, Va., and Evansville, Ind. At the former place, Mr. A. M. Schoen found that the lead water services were being corroded about four times as fast as the iron gas services, but serious damage to mains has occurred in a comparatively small area. At Evansville, Mr. F. B. Rae recommends the following steps to prevent electrolysis:—(1) Take out all connections between the water and gas pipes and the rails in order to make the ground resistance between rails and pipes as high as possible. (2) Connect the negative bus-bar of the switchboard by conductors of proper size to the rails at points a short distance from the station. (3) Connect the negative bus-bar to the water and gas mains by a strong, firmly-bonded copper conductor of low resistance. (4) Bond the rails properly so as to make the track system a good conductor.

Mr. Whitworth Wallis delivered on Friday his second lecture on "Pompeii, the City of the Dead," in the principal gallery of the Whitworth Institute, Manchester. The lecturer described the great public buildings of the city, the remains of which have been unearthed in the course of the excavations, and translated inscriptions upon tombs of nineteen hundred years ago. Lantern slides were shown of the Forum, the temples, the theatres, and the statues of Pompeii, both as they probably appeared before the catastrophe of 79, and in the condition in which they have been recovered in modern times. The third and last lecture of the series will be given this (Friday) evening, and will be devoted to the art treasures which have been found among the remains of the destroyed city.

The Rochdale Corporation are promoting a Bill in Parliament for authority to construct a working system of tramways. The tramway will embrace a total length of about 18 miles, and will cost (exclusive of the amount required for the purchase of the present tramway company's property) about £250,000. The scheme proposes to alter the gauge of the existing tramways from 3ft. 6in. to the standard gauge of 4ft. 8½in., with a view to joining up with the systems of the neighbouring authorities of Oldham and Bury, which in their turn will probably connect with Manchester. The Bill also seeks power to construct several new streets and to widen others, with a view to get better communication with the outlying parts of the borough. This will involve a further expenditure of about £50,000. The Rochdale Corporation have presented a memorial to the Local Government Board in favour of the proposed extension of their boundary by amalgamating with the Urban District of Castleton, which joins the borough on the south-westerly side of the town. The proposed extension would add an area of about 2,400 acres and a population of about 8,000, and a ratable value of about £36,000. The corporation is at present installing an electric-lighting station to provide electrical energy for both lighting power and tramway traction purposes.

At the last meeting of the Lancashire and Cheshire Antiquarian Society, held in the library of Chetham's College, Manchester, the Rev. H. A. Hudson gave an account of the Manchester Cathedral bells. There are, he said, ten bells of four different dates in the cathedral tower. As the earliest date of the casting of either of these bells was 1706, they could not be said to possess that peculiar interest which surrounds ancient bells. Warden Langley, of Prestwitch, made a gift of bells which lasted until 1679. The peal then was one of five, and the recasting of these, with the provision of an additional bell, was intrusted to William Noon, of Nottingham, at that time a young man. He did his work so ill that in less than 30 years the whole peal had to be recast. Mr. Hudson described some negotiations on this matter with the Manchester wardens and the wardens of Didsbury, together with meetings of Manchester parishioners on the question. Eventually, in 1704, the wardens were directed to recast the whole of the bells. They ordered a peal of eight, which were cast in Gloucester. How well the work was done was shown by the fact that six of these eight bells were as sound to-day as when cast. The sixth and the tenor had undergone recasting. In 1825 two additional bells were added.

The will of Sir Arthur William Blomfield, of 28, Montagu-square, A.R.A., F.R.I.B.A., who died on October 30 last, has been proved. He bequeathed to his son Charles James, one of the executors, the large silver centre piece presented by the parishioners of St. Botolph, Bishopsgate, to the testator's father, the late Dr. Blomfield, on his appointment to the Bishopric of London. He bequeathed to his sons, Arthur, Conran and Frank Blomfield, the silver waiter and coffee-pot, the gift of Lord Ebury on his marriage, and the silver salt cellars, the gift of the Duke of Westminster, then Earl Grosvenor, on his marriage. He bequeathed his architectural works, his works on art, and his architectural instruments to his sons Arthur, James and Conran; and to his wife, Dame Sara Louisa Blomfield, his household effects and the income during her life of his residuary estate, which, subject to her life interest, is to be in trust as to £1,000 for his daughter, Adele Dorothy, and as to the ultimate residue for his said daughter Adele, his daughter Mary Esther, his son Frank, and his daughter Rose Ellinor. The late Sir Arthur Blomfield's personal estate has been valued at £27,589 16s. 5d.

The base of the old churchyard cross at Mytton, Lancs, has recently been discovered, and is now placed in the Sherburne Chapel, where it has been inspected by antiquaries from Stonyhurst, Preston, Burnley, and Blackburn. It is a large square block of stone, splayed in its upper portion, and terminating in a sexagonal support, into which the stem of the cross was formerly inserted. It was generally thought that the Mytton Cross was of the same age as the crosses at Whalley, which Whitaker assigns to the time of Paulinus; but this question is now set at rest. At most the Mytton Cross is only of Norman or Early English origin. The head of it is still preserved in the churchyard, where it has been restored as a memorial of the Queen's Jubilee. On one side there is a representation of the Crucifixion in low relief on a sunk panel which has for bordering a looped cord, the corners of which bear in each case a *fleur de lis* as ornament. On the other side the Crucifixion is roughly portrayed, in this case with attendant figures, probably of St. John and St. Mary, as on the ancient roods. These are also shown on a sunken panel in rough tabernacle work undoubtedly Norman in character. Another discovery which has been made in connection with the parish church is that of the missing tower finials. These have been found adorning the gables of the old Tudor hall which stands in the centre of the village, to which place they were carried probably in Puritan times, when the hands of the devastator were laid roughly on our ancient monumental structures.

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Society of Arts. "Art Enamelling upon Metals," Cantor Lecture No. 4, by H. Hardinge Cunynghame. 8 p.m.
Surveyors' Institution. Discussion on "Party-Walls under the London Building Act, 1894." 8 p.m.
Tuesday.—Institution of Civil Engineers. 8 p.m.
Wednesday.—Society of Arts. "Sea Angling and Legislature," by F. G. Aflalo. 8 p.m.
Edinburgh Architectural Association. "Eleventh-Century Buildings in South-Eastern Italy," by F. W. Deas, M.A. 8 p.m.
Thursday.—Society of Arts. "Round about the Andamans and Nicobars," by Colonel R. C. Temple, C.I.E. 4.30 p.m.
Friday. — Architectural Association. "Streets and Buildings of Old London," by Andrew Oliver. 7.30 p.m.

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THE ARCHITECTURAL ASSOCIATION.
DECEMBER 15th—ORDINARY MEETING at No. 9, Conduit-street, W., 7.30 p.m. Paper by Mr. ANDREW OLIVER, on "Streets and Buildings of Old London," illustrated by lantern views.
G. B. CARVILL } Hon. Secs.
R. S. BALFOUR }

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Trade News.

WAGES MOVEMENTS.

Aberdeen.—In accordance with the by-laws regulating the joiner trade in Aberdeen, notice of any change desired in the coming year by either employers or employed has to be given by the first Monday of December. The men asked for no alterations on the 4th inst.; but the Master Builders' Association intimate that, on account of the dulness in the building trade (succeeding an exceptionally active period, during which the wages have been raised), a reduction will be made in the rate of pay to the extent of 1d. per hour, to take effect from 1st April next. The present rate is 8½d. per hour.

Bradford.—The threatened dispute between the Master Plasterers' Association of Bradford and the Operatives' Society is now likely to be settled in an amicable manner. The men demanded an advance from 8½d. per hour to 10½d. per hour, commencing from January 1st next, but as a result of negotiations an offer of 9½d. per hour, commencing on February 1st, has been accepted.

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On Saturday afternoon the new building for the use of the officers and apprentices, which has been added to the Seamen's Church and Institute at the Mill Dam, South Shields, was dedicated by the Bishop of Durham. Mr. R. Harper was the contractor.

Some extensive contracts for the supply of iron girders, &c., to be used in the construction of the National Harbour at Dover, have been placed with Belgian firms. The first deliveries of this ironwork are now beginning to arrive at Dover.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	,,	9 0 0
Wrought-Iron Girder Plates	8 15 0	,,	9 15 0
Bar Iron, good Staffs	8 7 6	,,	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 0 0	,,	17 5 0
Do., Welsh	5 15 0	,,	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	,,	8 5 0
Best Snedshill	10 0 0	,,	10 10 0

Angles 10s., Tees 20s. per ton extra.
Builders' Hoop Iron, for bonding, &c., £6 15s.
Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.
Galvanised Corrugated Sheet Iron—

	No. 18 to 20.		No. 22 to 24.
6ft. to 8ft. long, inclusive	Per ton.		Per ton.
gauge	£14 10 0	...	£15 0 0
Best ditto	15 0 0	...	15 5 0

	Per ton.		Per ton.
Cast-Iron Columns	£9 0 0	to	£9 15 0
Cast-Iron Stanchions	9 0 0	,,	9 15 0
Rolled-Iron Fencing Wire	10 15 0	,,	11 15 0
Rolled-Steel Fencing Wire	10 15 0	,,	11 15 0
,, ,, ,, Galvanised.	14 0 0	,,	20 0 0
Cast-Iron Sash Weights	5 17 6	,,	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	,,	11 0 0
Cut Floor Brads	9 15 0	,,	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
12/-	12/6	13/-	13/9	14/6	15/6	16/6	18/3	20/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	,,	7 0 0
7in. to 24in. (all sizes)	6 15 0	,,	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b.:—

Gas-Tubes	62½ p.c.
Water-Tubes	57½ ,,
Steam-Tubes	56½ ,,
Galvanised Gas-Tubes	50 ,,
Galvanised Water-Tubes	45 ,,
Galvanised Steam-Tubes	40 ,,

	10cwt. casks.		5cwt. casks.
	Per ton.		Per ton.
Zinc, English	£33 0 0	to	£34 0 0
Do., Vieille Montagne	34 10 0	,,	35 15 0
Sheet Lead, 3lb. per sq. ft. super.	20 0 0	,,	20 5 0
Pig Lead, in 1cwt. pigs	17 0 0	,,	17 10 0
Lead Shot, in 28lb. bags	20 10 0	,,	21 10 0
Copper Sheets, sheathing and rods	95 15 0	,,	93 0 0
Copper, British Cake and Ingot	77 10 0	,,	78 10 0
Tin, Straits	128 0 0	,,	129 0 0
Do., English Ingots	133 0 0	,,	134 0 0
Spelter, Silesian	20 12 6	,,	20 15 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£16 10 0
,, Bangkok	,, ...	11 0 0	,,	15 10 0
Quebec Pine, yellow	,, ...	5 5 0	,,	7 0 0
,, Oak	,, ...	4 10 0	,,	6 10 0
,, Birch	,, ...	2 15 0	,,	4 15 0
,, Elm	,, ...	5 0 0	,,	5 10 0
,, Ash	,, ...	4 5 0	,,	5 0 0
Dantsic and Memel Oak	,, ...	2 10 0	,,	4 10 0
Fir	,, ...	3 0 0	,,	4 0 0
Wainscot, Riga p. log	,, ...	3 10 0	,,	5 15 0
Lath, Dantsic, p.f.	,, ...	4 10 0	,,	5 10 0
St. Petersburg	,, ...	4 0 0	,,	6 10 0
Greenheart	,, ...	7 15 0	,,	8 0 0
Box	,, ...	7 0 0	,,	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	,,	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	,,	0 0 7½
,, Honduras	,, ...	0 0 4½	,,	0 0 6
,, Mexican	,, ...	0 0 3½	,,	0 0 4
,, African	,, ...	0 0 3½	,,	0 0 5
Cedar, Cuba	,, ...	0 0 4	,,	0 0 4½
,, Honduras	,, ...	0 0 3½	,,	0 0 3½
Satinwood	,, ...	0 0 10	,,	0 1 9
Walnut, Italian	,, ...	0 0 3	,,	0 0 7½
,, American	,, ...	0 2 3	,,	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in.:—

Quebec, Pine, 1st	£20 0 0	to	£27 0 0
,, 2nd	15 0 0	,,	17 10 0
,, 3rd	9 0 0	,,	11 0 0
Canada Spruce, 1st	9 0 0	,,	11 10 0
,, 2nd and 3rd	7 10 0	,,	9 0 0
New Brunswick	7 0 0	,,	8 10 0
Riga	9 0 0	,,	10 0 0
St. Petersburg	10 10 0	,,	17 0 0
Swedish	10 10 0	,,	17 10 0
Finland	9 10 0	,,	11 0 0
White Sea	12 5 0	,,	18 15 0
Battens, all sorts	5 0 0	,,	16 0 0
Flooring Boards, per square of 1in.:—			
1st prepared	£0 10 0	,,	£0 15 0
2nd ditto	0 9 0	,,	0 11 0
Other qualities	0 4 6	,,	0 9 6
Staves, per standard M:—			
U.S. ditto	£35 0 0	,,	£42 10 0
Memel, cr. pipe	210 0 0	,,	220 0 0
Memel, brack	180 0 0	,,	190 0 0

OILS.

Linseed	per tun	£21 12 6	to	£21 15 0
Rapeseed, English pale	,, ...	23 15 0	,,	24 0 0
Do., brown	,, ...	22 5 0	,,	22 10 0
Cottonseed, refined	,, ...	19 0 0	,,	19 5 0
Olive, Spanish	,, ...	34 5 0	,,	35 5 0
Seal, pale	,, ...	21 0 0	,,	22 0 0
Cocoanut, Cochin	,, ...	29 10 0	,,	29 15 0
Do., Ceylon	,, ...	25 5 0	,,	25 10 0
Palm, Lagos	,, ...	25 10 0	,,	23 10 0
Oleine	,, ...	18 15 0	,,	19 15 0
Lubricating U.S.	per gal.	0 6 8	,,	0 7 6
Petroleum, refined	,, ...	0 0 6½	,,	0 0 6½
Tar, Stockholm	per barrel	1 6 6	,,	1 6 6
Do., Archangel	,, ...	0 19 0	,,	1 0 0
Turpentine, American	per tun	32 10 0	,,	33 0 0

LIST OF COMPETITIONS OPEN.

Ilford—Church (limit £4,000)	£20, £15, £10	J. Lamb, 20, Belmont-road, Ilford, Essex	Dec. 12
Lymm—Council Offices, Whitbarrow-lane (£2,800)	£25 (merged), £15	W. Mullard, Clerk, Council Offices, Lymm	,, 15
Dunoon—East Bay Improvement	£100, £50, £25	J. Valrose Clery, Town Clerk, Dunoon	Jan. 31
Doncaster—Isolation Hospital (41 beds)	£25 (merged), £15	F. E. Nicholson, Solicitor, U.D.C. Offices, Doncaster	Feb. 28
Belfast—Assembly Hall and Central Offices	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast	Mar. 12
Harrogate—Northern Police Convalescent Home		The Hon. Secretary, St. George's, Harrogate	—
Glasgow—General Hospital (1,200), Stobhill Estate, Springburn	£200, £100, £50	Jas. R. Motion, Parish Council Chmbrs., 38, Cochrane-st., Glasgow	—

LIST OF TENDERS OPEN.

BUILDINGS.

Hither Green, S.E.—Sunday School and Manse	Bible Christian Church Trustees	E. J. Hamilton, Architect, 2, New-road, Brighton	Dec. 9
Spean Bridge—Two Villas		L. and J. Falconer, Architects, Fort William	,, 9
Kilmallock—Repairs to Labourers' Cottages	Kilmallock Rural District Council	P. J. Coll, Clerk, Kilmallock	,, 9
Linthorpe—Two Detached Villas on the Phillipsville Estate		Arthur F. Newsome, M.S.A., Albert-road, Middlesbrough	,, 9
Gwennap—Classrooms, &c., Lanner Schools	School Board	Geo. S. Bray, Clerk, Redruth	,, 9
Dundraw—Mission Church		J. H. Martindale, Architect, Viaduct Chambers, Carlisle	,, 9
Kelty—Police Station	Fife County Council	David Henry, Architect, Church-square, St. Andrews	,, 9
Catterick—House and Stabling	Dr. H. Eyres	Clark and Moscrop, FF.R.I.B.A., Architects, Darlington	,, 9
Staincliffe—Fireproof Store Shedding		John Barton and Son, Architects, Halifax-road, Dewsbury	,, 9
Harrow—Repairs to Old Schools, Harrow Weald	Harrow United District School Bd.	Arthur Fillmore, Clerk, Harrow	,, 9
Manchester—Rebuilding Houses, Hall's-crescent, Rochdale-road	Paving Committee	The City Surveyor's Office, Town Hall, Manchester	,, 11
Bridlington Quay—Additions to Shop, West-street		J. Earnshaw, Architect, Wellington-road, Bridlington Quay	,, 11
Gildersome—Sheds, &c.	District Council	T. A. Buttery and S. B. Birds, Architects, Queen-street, Morley	,, 11
Lower Edmonton, N.—Superstructure of Three Cottages	Urban District Council	G. E. Eachus, Engineer, Town Hall, Lower Edmonton, N.	,, 11
Settle—Alterations to Town Hall Buildings		Henry Ross, Architect, Cannon-street, Accrington	,, 11
Wavertree—Cottage Home School (400), Olive Mount	Liverpool Select Vestry	Edmund Kirby, Architect, 5, Cook-street, Liverpool	,, 11
Castleford—Two Dwelling-Houses, Smawthorne-lane	J. Appleby	Arthur Hartley, Architect, Carlton Chambers, Castleford	,, 11
Trecynon—Altering Co-operative Stores		T. Roderick, Architect, Clifton-street, Aberdare	,, 11
Lochgelly—Block of Twenty Two-Storey Tenements	Co-operative Society	John Murray, Architect, 233, High-street, Kirkcaldy	,, 11
Slapton—Cowhouses		H. Vickery, Surveyor, Torcross	,, 11
Croydon—Extension of Flues and Boiler Settings	Town Council	E. Mawdesley, Town Clerk, Town Hall, Croydon	,, 11
Sligo—Works and Repairs at County Infirmary		W. T. Vernon, Secretary, Courthouse, Sligo	,, 12
Belfast—New Premises, Donegal-square East	Ocean Accident & Guarantee Corp.	Young and Mackenzie, Architects, Scottish Prov. Buildings, Belfast	,, 12
Great Yarmouth—Additions Munsborough House, Wellesley-rd.	Edgar Bond	Chas. G. Baker, Architect, Yarmouth	,, 12
Portlethen—Additions to School		G. Wilson, Architect, 181A, Union-street, Aberdeen	,, 12
Leyton—Infirmary (672 patients)	West Ham Union Guardians	Francis J. Sturdy, A.R.I.B.A., 44, Finsbury-pavement, E.C.	,, 13
Wolverhampton—Repairing, &c., Board Schools (Three Years)	School Board	T. H. Fleming, Architect, 102, Darlington-street, Wolverhampton	,, 13
Hull—Offices in High-street		B. S. Jacobs, Archt., Lincoln's Inn Buildings, Bowlalley-lane, Hull.	,, 13
Bangor, Ireland—Residence, Sandy-row	Dr. Gorman	J. V. Brennan, Architect, Belfast Bank Chambers, Belfast	,, 13
Fartown—House, Spanes-road		J. Berry, Architect, 9, Queen-street, Huddersfield	,, 13
Ipswich—Stables, Sanitary Authority's Yard, Wolsey-street	Paving and Lighting Committee	E. Buckham, Borough Surveyor, Town Hall, Ipswich	,, 13
Heckmondwike—Shops and Offices, Market-st. and Church-st.		Castle and Son, Architects, Market-street, Heckmondwike	,, 13
Larne—Improvements to Kitchen and Scullery at Workhouse	Guardians	William Hay, Clerk, Union Office, Larne	,, 13
Batley—Detached House in Deighton-lane		C. H. Marriott & Son, Architects, West Park-street, Dewsbury	,, 13
Hooton, Birkenhead—Engine Bed and Foundation	West Cheshire Water Co.	W. Martin Jones, Secretary, 9, Hamilton-square, Birkenhead	,, 13
Shildon—Tower to the Parish Church		C. Hodgson Fowler, F.S.A., The College, Durham	,, 14
Belfast—Eight Shops, Donegal-square West	Scottish Provident Institution	Young & Mackenzie, Archts., Scottish Provident Buildings, Belfast	,, 14
Southerdown—Westcliffe Hotel	William Powell	G. F. Lambert, Architect, Bridgend	,, 14
Huddersfield—Livery Stables	Ben Oxley and Sons	John Kirk and Sons, Architects, Huddersfield	,, 14
Wigan—Technical College, Library-street		Briggs and Wolstenholme, Architects, Richmond-terrace, Blackburn	,, 14
Thornton Heath—Masonry Clock-Tower (25ft. high)	Croydon Town Council	The Borough Engineer's Office, Town Hall, Croydon	,, 14
South Kensington—Foundations, &c., Victoria & Albert Museum	H.M. Commissioners of Works	Sir John Taylor, K.C.B., H.M. Office of Works, Storey's Gate, S.W.	,, 15
Bredbury—Police Station		H. Beswick, County Architect, Newgate-street, Chester	,, 15
Abergavenny—Additions, Congregational Church, Castle-street	Building Committee	B. J. Francis, Architect, Abergavenny	,, 15
Aberlour—Dwelling-House		Charles C. Doig, Architect, Elgin	,, 15
South Kensington—Foundations, &c., Royal College of Science.	H.M. Commissioners of Works	Sir John Taylor, K.C.B., H.M. Office of Works, Storey's Gate, S.W.	,, 15
Shipley—Business Premises, Dale-street		Walker and Collinson, Architects, Swan Arcade, Bradford	,, 15
Leeds—Taking Down Retort House, &c.	Gas Committee	R. H. Townsley, General Manager, Calverley-street, Leeds	,, 16
Abingdon—Hospital	Joint Hospital Board	J. G. T. West, M.S.A., Abingdon	,, 16
Shirebrook—Lock-Up	Standing Joint Committee	J. Somes Story, County Surveyor, St. Mary's-gate, Derby	,, 16
Brydekirk—Additions to Public School		Irving Moffat, Clerk, Kirtlebridge	,, 16
Stamullen—Additions, &c., to Parochial House	Rev. Wm. J. Davis, P.P.	Anthony Scott and Son, Architects, William-street, Drogheda	,, 16
Tooreen—Dwelling-House	Charles O'Hara Trench	John Smith, M.I.C.E., Ballinasloe	,, 16
Bridlington—Business Premises, High-street	J. Wilcock	Samuel Dyer, Architect, Bridlington	,, 16
Howden—Police Station and Courthouse	East Riding Standing Joint Com.	Alfred Beaumont, C.E., County Surveyor, County Hall, Beverley	,, 17
Paul—Infants' School at Trewarveth-street	School Board	Henry Maddern, Architect, 26, Clarence-street, Penzance	,, 18
Leeds—Restoration and Additions to St. George's Church		Henry Walker, Architect, 8, Upper Fontaine-street, Leeds	,, 18
Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Langham and Osborne, Architects, 70, High-street, Ramsgate	,, 18
Fleetwood—Board Schools (730)	School Board	Walter H. Haworth, Architect, 15, Mawdsley-street, Bolton	,, 18
Keighley—Cavendish Hotel	Thomas Ramsden and Son, Ltd.	W. H. D. Horsfall, Architect, Tower Chambers, Silver-st., Halifax	,, 18
Romford—Laundry at Workhouse	Board of Guardians	R. L. Curtis, Architect, 119 and 120, London Wall, E.C.	,, 18
Sedgley—Additions, Upper Gornal School	School Board	A. Ramsell, Architect, Wolverhampton-street, Dudley	,, 18
Ashford—Additional Hospital Buildings, Willesborough Lees.	Rural District Council	Horace Hamilton, Clerk, 11, Bank-street, Ashford, Kent	,, 18
London, E.C.—Two Transformer Stations, Great Cambridge-road and Queen's-road	Shoreditch Vestry	J. Rush Dixon, A.M.I.C.E., Town Hall, Old-street, E.C.	,, 19
Burnley—Extension of Goods Yard, &c., Manchester-rd. Station	Lancashire and Yorkshire Ry. Co.	R. C. Irwin, Secretary, Hunt's Bank, Manchester	,, 19
Frome—Stable	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 19
Birkenhead—Wing to Science and Art School	Corporation	C. Brownridge, A.M.I.C.E., Boro' Engineer, Town Hall, Birkenhead	,, 19
Wortley Junction—Alterations, &c.	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	,, 19
Blaen Llynvi—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 19
Dearham—Repairs	School Board	J. Russell, Clerk, Maryport	,, 19
Thornhill—Goods Shed	Lancashire and Yorkshire Ry. Co.	W. B. Worthington, Engineer, Hunt's Bank, Manchester	,, 19
Barking—Ejector Station, &c.	Urban District Council	C. J. Dawson, F.R.I.B.A., Surveyor, Public Offices, Barking	,, 19
Chiswick, W.—Additions to Vestry Hall, Heathfield-terrace	Urban District Council	Arthur Ramsden, Surveyor, Vestry Hall, Chiswick	,, 20
Pentre—Infants' School at Stanleytown	Ystradyfodwg School Board	Jacob Rees, Architect, Hillside Cottage, Pentre	,, 21
Fulham, S.W.—Alterations to 9, Parson's-green	Board of Guardians	A. Saxon Snell, F.R.I.B.A., Southampton Bldgs., Chancery-l., W.C.	,, 21
Ovenden—House and Stable		Jackson and Fox, Architect, 7, Rawson-street, Halifax	,, 23
Rastrick—Rebuilding Junction Inn	Halifax Brewery Co.	W. Clement Williams, Architect, 29, Southgate, Halifax	,, 23
Cardiff—Receiving and Lunatic Wards at Workhouse	Guardians	Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff	,, 23
Newcastle-upon-Tyne—Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, F.S.A., Archt., 37, Grainger-st., Newcastle-on-Tyne	,, 30
Donington—Tool-House	Parish Council	A. G. Fletcher, Clerk, Donington	,, 30
Cilybebyll—Isolation Hospital	Pontardawe Hospital Committee	John Morgan, Surveyor, Herbert Chambers, Pontardawe	Jan. 3
Whitley—Council Offices, Fire Brigade House, and Stores	Whitley and Monkseaton U.D.C.	J. P. Spencer, A.M.I.C.E., 13, Grainger-st. West, Newcastle-on-T.	,, 5
Swindon—Additional Hospital Buildings	Swindon and Dis. Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	,, 6
Otley—Two Houses, Station-road		A. Marshall, M.S.A., Architect, Otley	—
Mealsgate—Adding 50ft. to Pit Chimney		William Ramsay, Allhallows Colliery, Mealsgate, via Wigton	—
Parkstone—Club Premises, Ashley-road	Heatherland Unionist Club	Walter Andrew, Architect, Alton Office, Parkstone	—
Beeston—Schools, Humber-road		Robt. Clarke, Architect, Prudential Buildings, Nottingham	—
Castleford—Additions to Premises, Carlton-street	E. Millar	Garside and Pennington, Architects, Castleford	—
Hull—Alterations to Imperial Hotel		W. S. Walker and J. M. Dossor, Joint Archts., 2, Manor-st., Hull	—
Raunds—Six Houses, Marshall-road	Robinson and Northern	Harry Knight, Surveyor, Newton-road, Rushden	—
Hemingfield—House and Stable		John Robinson, Wombwell	—
Cloughton—Cottages	H. E. Donner	Charles Edeson, Architect, 5, Huntriss-row, Scarborough	—
Walham Green, S.W.—Block of Flats		Albert G. Hastilow, Architect, 104, Upper Richmond-road, Putney.	—
Southerdown—Additions to Marine Hotel	R. T. Davis	Seddon and Carter, Archts., Bank Buildings, St. Mary-st., Cardiff.	—
Horwich—Enlargement of British Schools, Lee-Lane		E. W. Dyson, Architect, 17, Lee-lane, Horwich	—
Cambridge—Corrugated Shed (40ft. by 80ft.)		Pamplin Bros., Cherry Hinton Works, Cambridge	—
Rawtenstall—Showrooms, &c.	Eastwood and Clegg	F. Hobson, Architect, Burnley-road, Rawtenstall	—
Farsley—Eight Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Sheffield—Works, Buildings, &c., Walkley-lane	G. A. Milne	Henry Webster, Archt., St. Mary's Chmbrs., Norfolk-row, Sheffield	—
Whalley Range—Presbyterian Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Belfast—Improvements to Licensed Premises, Roden-street	A. and D. Rooney	W. J. Moore, Architect, Whitehall Buildings, Ann-street, Belfast	—
Muckamore—Repairing and Ventilating Presbyterian Church		J. Hawthorne, Dunadry	—
Rawtenstall—Bakery and Stables	Hartley and Co.	F. J. Hobson, Architect, King-street, Rawtenstall	—

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DUAL BUILDINGS AND THEIR CONSTRUCTION.

VERY puzzling questions relating to buildings under the London Building Act come before the magistrates. One of these is what we may call a "dual" building—one with a double purpose; as when a building is used as a shop or public-house on the lower floor, and for residential purposes on the upper floors. There is an express section in the Building Act for 1894, section 74 (subsection 2), which deals with buildings used in part for purposes of trade and manufacture and in part as a dwelling-house, wherein it is provided that the two parts shall be "separated by walls and floors constructed by fire-resisting materials," and that "all passages, staircases, and other means of approach to the part used as a dwelling shall be constructed throughout of fire-resisting materials." This clause, which is an addition, applies only to buildings exceeding ten squares in area; so that it would not apply to a building, say 20ft. frontage and 50ft. deep, an ordinary street house; but it would apply to any building that exceeded these dimensions by however little. The section goes on to say that "the part used for purposes of trade or manufacture shall, if extending to more than 250,000c.ft., be subject to the provision of this Act relating to the cubical contents of buildings of the warehouse class." Though apparently clear to the unpractical or untechnical mind, disputes or questions are constantly cropping up. Building owners, who want to make the most of their premises and to let them to the best pecuniary advantage are anxious to build the ground floor as a shop or factory and to let the upper part for dwellings or residential flats; at the same time, they are not very careful to find out what the provision for this kind of double occupation involves on their part. Our readers will remember several instances under the old Act where the law has been evaded. There is now less opportunity; the 1894 Act has been made more stringent by the addition of the clause we have quoted, but there are still technical loopholes. One of these is the question raised in "Carritt v. Godson" that a fully-licensed house is not within the section. Such a case we reported in our "Legal Intelligence" last week, tried in the Queen's Bench Division, before Mr. Justice Bruce and Mr. Justice Bigham. A building owner gave notice to the district surveyor of his intention to erect a public-house, the ground floor of which was to be used as a public-house, and the first and second floors for residential purposes. Under this section 74 a notice of objection was served that the building was not in accordance with the section; but the owner appealed to the magistrate, who, after hearing both sides, allowed the appeal, and refused to state a case on the point raised by the London County Council on the ground that it was decided in "Carritt v. Godson." A rule *nisi* was moved for calling upon the magistrate of Westminster Police-court to show cause why he should not state a case raising a point which the County Council desired should be decided under the Act, and the Court granted a rule.

The question has a wider interest than that of any statutory enactment, as it concerns all interested in building in the county of London. When large and commodious structures are being erected to supersede the older and more restricted premises in our leading thoroughfares, it is important to let off some portion of such premises to separate tenants or lessees. It is convenient to divide a building horizontally, to let off the ground floor for shops or trade purposes, and the upper stories for offices or as dwellings. The party-wall or vertical division does very well for large factories and warehouses and for private dwellings; but for retail businesses and many trades, the shops on the ground-floor only are required; to occupy the upper stories would be unremunerative and often inconvenient. Perhaps the chief reason for a division of buildings in or near a great city is that people now live away from their work, and with the rise and development of our suburbs has arisen the desire to rent only shops, and to let the upper stories as offices or as tenements to those who have to be near their occupation. Hence the development of the residential block of flats with shops on the ground floor, now so prevalent in all parts of London. And this system of combined commercial and residential blocks, stimulated to a large extent by speculators and ground landlords, has none too soon been anticipated by legislation. The old Metropolitan Building Acts permitted buildings to be erected or altered that were grievously inadequate and unfit for residential purposes. There was no adequate protection against fire for those who tenanted the upper floors; the entrances, staircases, and landings were often mere traps when the lower story was involved, and it must be remembered that the shop premises are the most open to this danger, where the shop is often packed full of inflammable materials such as cotton goods. And is there not danger in the highly-heated and combustible woodwork of the brilliantly-lighted bar of a public-house? That this class of property, licensed or not, should be an exception to the safeguards provided in the Act we do not quite understand. Very often these bars are full of partitions and woodwork in the older houses, and there is no separate staircase to or from the upper stories. Is the floor between the bar and the stories above built according to fire-resisting methods? At any rate, the architect employed in this class of buildings of a dual kind will have to study more the question of horizontal division with as far as possible separate "risks," each floor, or that between the trade and residential part, being separate and self-contained. As we make our vertical divisions or party-walls incombustible, so we ought to render our floors impregnable to fire, or, at any rate, so near this condition that a fire playing on the under-side of a floor will give the occupants above ample time to escape. The danger, no doubt, is chiefly owing to imperfect and combustible staircases, lifts, and the like; but these latter ought not to communicate to the upper rooms, but be cut off by brick walls and iron doors. As to the staircase, of course, it ought not to pierce the floor dividing the shop from the dwellings. In other words, the latter should have a separate staircase walled round next the outside of building, and opening at the bottom direct on the street, such as is now required for our theatres and places of amusement or public assembly under section 80, and also for other buildings over 125,000ft. cube for separate families (section 68), and these staircases might be made external features of such buildings, and be crowned by cupola roofs that would be made useful in several ways, as ventilating shafts, or as receptacles for tanks or clocks. Nothing at present of this kind is attempted; rather these stairways are looked upon as legal requirements to be hidden out of sight as much as possible. The horizontal or floor division also suggests some strongly marked architectural line, band of relief, or plain cornice.

Not less important is the constructive systems that are best adapted for floors and partitions, so that the divisions between the parts used for trade and those used for dwellings may be as impervious to the dreaded element as possible. The Act says these parts shall be "separated by walls and floors constructed of fire-resisting materials." "Fire-resisting materials" are defined in schedule 2 as brickwork constructed of good bricks well burnt, hard, and sound; good mortar of good lime and sharp, clean sand, hard, clean broken brick, grit, or slag, or good cement, granite, or other stone, iron, steel, copper, &c. For staircases, oak or teak or other hard timber, with treads and risers 2in. thick, slates, tiles, brick, and terracotta for coverings, concrete, &c., are named. These are specified as fire-resisting, but little is said of the mode of construction, the system of flooring. Many of these materials we know something about. The valuable series of fire tests undertaken by the British Fire Prevention Committee, of which we have from time to time given the results, have proved that solid framed oak and teak doors, 2in. thick, can withstand a fierce fire for about an hour; that ceilings of silicate cotton on 9in. by 3in. deal joists, 19in. from centres with slag wool slates screwed to both sides of joists, at ends, and of the full depth, with slag wool plates screwed to bottom, with tongued, grooved, and beaded matchboarding as ceiling, resisted fire uninjured for one hour even under the application of water. Other tests have proved the value of many of the fire-resisting floors in which iron or steel and concrete have been used, of brick-nogged partitions, floors, &c., of the Expanded Metal Company, and the great resistance offered by the British Luxfer Prism glass and their mode of glazing. If such methods were enjoined, it would be possible to construct horizontal and vertical divisions in buildings used for both trade and dwelling purposes that would resist fire or reduce its power to a minimum, and the cost of some of these tried methods would not seriously tax the building owner, or make it worth his while to evade so important a statute.

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THE ROYAL ACADEMY PRIZE DESIGNS.

THE designs of the successful and unsuccessful students of the Royal Academy Schools have been on public view at Burlington House during the week. The President of the Royal Academy, Sir E. J. Poynter, distributed the prizes on Saturday last. We now briefly refer chiefly to the designs awarded the medals and studentships. The architectural subjects for which prizes have been awarded possess a little better grasp of those qualities than we have been accustomed to see in this branch of design. One of the subjects selected for competition among students of the architectural school was "A Public School for Two Hundred Boys." The Gold Medal and Travelling Studentship of £200 have been awarded to Horace Charles Hide. His plan is well considered and symmetrical. The assembly-hall or great schoolroom forms the backbone or main axis of the arrangement; in front, projecting as wings at right angles to the end of hall, are the chapel on the right hand, east and west, and the library, museum, and art school block on the other side. These are approached from corridors on right and left respectively from the central vestibule. On each side of the central hall are placed classrooms, those on the right or eastern side being the head master's classrooms, &c. At the further end of great hall project two smaller wings parallel to those in front, occupied also as classrooms. An inner corridor each side of central hall gives access to these classrooms and to the end wings, the hall itself being carried up to a considerable height, and is lighted by large clerestory windows over the roofs of the classrooms. Such is the general scheme. The corridors are well lighted and of good width, and the class rooms of the first, second, and third forms are well planned. The great hall or schoolroom for assembly is central and convenient from both sides, and also from ends, and is entered through doorways in the centre of side corridors as well as at the ends. It is 92ft. by 32ft., and has an apsidal end with platform and orchestra. The classrooms on each side, three in number, vary in size; the largest is about 28ft. by 18ft. 9in., another is 21ft. by 18ft.; they are well lighted on left hand of desks; each room has three rows with gangways. The library in front in connection with museum is 45ft. by 23ft. 6in., and the chapel on the other side has seats for 260. The first-floor plan over museum wing shows a gallery to end of great hall, a chemical laboratory 34ft. by 24ft. 6in., a lecture theatre with separate stairs from corridor. The hall is well proportioned, and lighted at end as well as by clerestory windows. A flat hammer-beam roof is shown over it, while the roof over chapel has cusped principals. The design is in a Late Gothic character, but freely-handled; octagon turrets flank the gable-end of chapel, and the vestibule is crowned by a square, tower-like mass, with lantern and turret over of a Late picturesque type. The working out of the design and details exhibits some skill in planning and a masterly sense of detail, although the drawings are unfinished, and not the strongest part of the performance. Next to this design is another able design (No. 196), which, but for its plan, might have run the first very hard; indeed, as a design, it has many excellent qualities. The author has adopted a quadrangular or cloister arrangement in the disposal of the classrooms, hall, and chapel. The school hall is placed on the left side, with the chapel forming part of the quadrangle on the right-hand side, and oriented. The classrooms form the rear or west side. Everything is subordinate to the chapel, which is of great height and length, and dignified, but severe, and of Romanesque character. The end has an apsidal termination, and is pierced by three plain, round-headed lights. At the angle of quadrangle and chapel rises a plain campanile; the front gable is relieved only by small windows and a centre crucifix. There is a conventual look about the group of buildings, full of severity and strength.

No. 198 has a symmetrical plan. There is a centre domed hall, with platform at one end and gallery at the other, and the classrooms and chapel are grouped in two ranges right and left with the advancing wings. The chapel forms one of these wings on the right-hand side as we look at the elevation. The ground story is largely made up of a series of arcades, forming a cloister in front. The left wing contains master's room, lobbies, first, second, and third forms; the corresponding wing, as we have said, being the chapel and ante-chapel, with organist, singing gallery, and practice-room over. The external design is of a Renaissance kind, but it is too low. The centre gabled hall is crowned by a well-designed cupola, and this is the best part of the design. Blocks of isolated buildings, latrines, swimming-baths, gymnasium, masters' houses on either side are shown, also workshops, and physical laboratory. A curious rectangular-planned set of buildings is shown in No. 197. The large school-hall is placed centrally with classrooms on both sides, and chapel at end. The arrangement is somewhat crowded, and the external elevations poor; two low bell-turrets, of peculiar design, flank the hall, which would be hidden. No. 193 is a confused plan, but clever in drawing and detail; the hall is placed on one side of classroom, and the chapel extends at right angles at one end. A heavy India-ink perspective accompanies this set.

The set of architectural drawings illustrating four bays of the S.E. angle of the cloisters of Westminster Abbey, by Francis Winter Newman, is justly entitled to the first silver medal; the draughtmanship is firm, and exhibits knowledge of detail. The vaulted roof of cloister required both accurate dimensions and careful drawing, the curvature and section of the ribs are shown, and the jointing and masonry, taken from real measurement, is not the least valuable part of drawings of this kind. A second medal for another careful set is awarded to Geo. Thow Smith. The set of designs (upper school) for which a prize of £25 is given, by Harry Inigo Triggs, represent an entrance to public gardens, simply and artistically treated, and in a sensible manner. The octagon turrets at sides of entrance and the other pencil details are pleasing. So also we must commend the award to F. W. Newman, of lower school, whose work we have just mentioned, for a banqueting-hall overlooking a lake. The design, although in pencil, is quiet and refined in outline, and the Classical details are restrained. A flat dome covers the square hall, which is approached by two flights of steps on each side of a low portico; the low stair turrets happily combine to form a graceful profile in the elevation. This student shows a knowledge of both Gothic and Classic. The subject given, plan of a house in a London street between two party-walls, was a useful but difficult theme. James Black Fulton has exhibited ingenuity and economy of space in his plan of a long strip of area in these unfavourable conditions. It is a five-storied building above the basement. By a small side area behind cloak-rooms, &c., Mr. Fulton lights a good hall and staircase, and behind this he places his dining-room, 24ft. by 18ft., illumined by another light-well behind, which also lights the side passage into a billiard-room the length of which is the whole width of house, 28ft. 3in. by 18ft. 3in. A library is placed over dining-room, and a spacious drawing-room over the front rooms and vestibule. It is awarded a prize of £10. There was no competition for original composition in ornament, nor for the perspective drawing in outline of the three central bays of the front of Whitehall.

We can only very briefly notice other prize designs. The most interesting, perhaps, is the design for the "decoration of a portion of a public building." The subject given was "Spring Driving Out Winter." Fred Appleyard, whose skill as a designer and painter has been rewarded for five different subjects, wins the prize (£40). The semicircular space given was not the easiest. The figures had to be treated not too realistically in the space, and it is rather amusing to see some of these attempts. In one or two "Spring" is anything but a beautiful creature, and her attitude and demeanour are commonplace and even ridiculous. "Winter" also was not an easy impersonation. Mr. Appleyard has, while avoiding these extremes, given a graceful composition, the attitude and grace of Spring in white and delicate green drapery, and the recumbent figure of a beautiful maiden and the "passing out" of an old bent man, "Winter," who holds behind him his symbol, are conceived happily, and the colour is harmonious.

There is considerable diversity in the treatment for the historical painting "Ladas, winner of the long foot-race at Olympia, falling dead as he goes to receive the crown of victory." The gold medal and travelling studentship (£200) is given to Frank Moss Bennett. Of course, the theme was an ambitious one: it called for the exercise of not only the imaginative faculty, but technical skill and knowledge of no mean order. The painter had to avoid a merely naturalistic indication of such an incident, and to give an appropriate and dramatic expression to the central figure of Ladas as well as to the astonished and alarmed spectators. He had also to bring to these faculties the resources of a knowledge of the period selected, and of the architecture, costume, and accessorial adjuncts of a Roman crowd in its best days. The successful student has to a certain degree accomplished these aims, and at least has outdone his competitors in a decided manner. As Professor Poynter has said, few are able to paint the figure as they know it; they are inclined to copy the commonplace model with its vulgarities as they see it. Imitation of the model is in no sense a true realism. The neglect of this dictum is apparent in the attempts made by students, not only in this subject but in the competition for cartoons. One or two of these representing Justice holding the scales and sword are very commonplace and vulgar; as also in the painting of heads from life. Literal imitation, or what we may more correctly call naturalistic imitation, of commonplace models is the chief fault to be met with in competitions where the human figure is concerned. The uneducated or uncultured painter is most likely to fall a victim to this commonplace realism. Sir Edward Poynter's remarks on the proper kind of realism are appropriate. He said that "true realism consisted in making use of their model for the proper presentment of the actor in the scene which they are representing." The student of this realism must not be content with the power of imitation; this was but a preliminary part of his equipment, but he must be able to express with the subtlety of nature the idea which he had formed in his own mind, and which was the only way in which the subject could be expressed. These competitions, both for figure compositions as well as for landscape, show, in not a few instances, the lack of this faculty of adequately and truly expressing the life and grace and motion, as well as colour and physical qualities of the objects represented. The picture or the composition must realise life or nature from within, and not be content to paint mere resemblances and technical qualities. To take, for example, the studies for a head from life. Many of these are mere copies of individuals, without life or meaning; the accidents of nature have been only too literally copied, with the result that they resemble caricatures; but in others, as in the two awarded silver medals, one by Gertrude Lindsay and the other by F. G. Swaish, we find chiefly the qualities of individuality, character, &c. The negro's head by the latter is full of expression. In the painting of a draped figure we also find the works sent in arrange themselves under these two heads—the literal and technical copy, and the realism of life and expression.

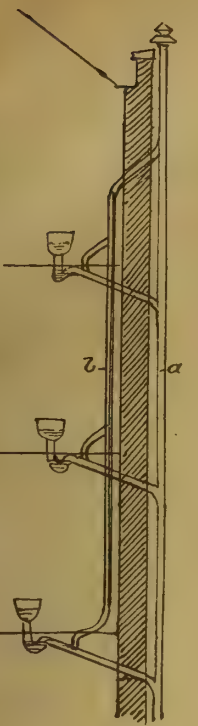
ESTIMATES.—XXXIV.

INTERNAL PLUMBING: WATER SUPPLY AND SANITARY DETAILS.

THE items we now proceed to deal with have reference to the water supply and sanitary fittings. The estimator will require to be furnished with the regulations of the water companies of the district, which give weights of pipes, regulations as to wastes and waste-preventers, &c. The lead in safes is kept separate from that in sinks and cisterns, as in the latter a lap of 1in. is allowed at the angles. Take soldered angles by the foot run, the four vertical angles and two horizontal angles, the ends, and bottom being often in one piece. The junctions of pipes are numbered as "extra soldered joints," also branch joints; these are described in size, according to the main pipe. Thus a "1¼in. extra soldered joint" means an inch or ¾in. pipe joined to a 1¼in. pipe.

Lead soil-pipes are made of sheet lead seamed; but now hydraulic-drawn pipes of larger diameter than formerly are made, they are preferable to seamed pipes. They

1



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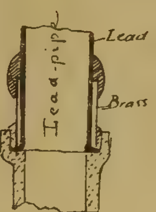

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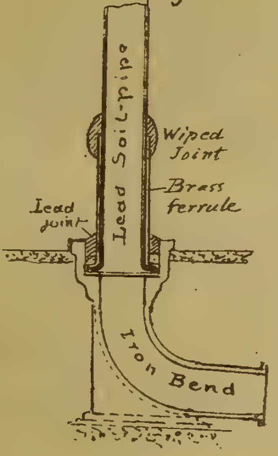

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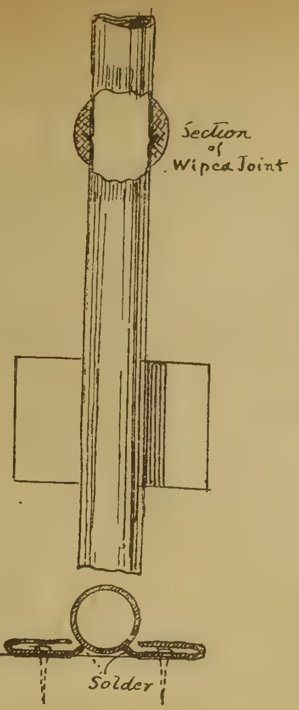

should be of uniform thickness, and from 8lb. to 10lb. per foot super. The joints should be "wiped" joints (see section 2). The soil-pipe should be carried up the full bore to the top, or above the level of eaves, and have an outlet, or one of Boyle's ventilating adjuncts. According to the L.C.C. by-laws, lead soil-pipes of 3½in. diameter are to weigh not less than 65lb. per 10ft. length; for 4in., 74lb.; 5in., 92lb.; and 6in., 110lb.

Soil-pipes should not be too large; they should be as small in diameter as consistent with efficiency. Like a small drain-pipe, they keep cleaner (see S. G. Hellyer's "Plumber and Sanitary Houses"). A 3½in. pipe is found sufficient, even where several closets discharge into it; on the other hand, a small pipe is liable to cause a siphoning action on the traps. To insure proper action, an anti-siphoning pipe 2in. diameter is necessary to relieve the pressure in the traps and to ventilate them (see section 1). Cast iron is now largely used instead of lead for soil-pipes. They should be about 4in. diameter, and should be not less than 5/16in. (⅜in. is better), and have 4in. sockets for lead caulking. The L.C.C. by-laws lays it down that a 3½in. pipe should weigh not less than 48lb. per 6ft. length, a 4in. 54lb., a 5in. 69lb., and a 6in. 84lb. Lead soil-pipes should be supported by ears or lead tacks, double or single (see sketch 2), every 5ft. or 6ft. apart. The mode of attaching the ear to the pipe by solder, and the nails for fastening them to the wall, are shown in the section; the ears are sometimes turned back to hide the nails, as shown. The elevation represents a double ear. The weight of soil-pipe in great heights is liable to settle and break the joint between it and the drain. Sketch 3 shows how it is supported by an iron bend, with pedestal and bed-plate resting on concrete. The brass ferrule shown allows the joint being caulked between iron and lead pipes. Section 4 shows the connection of lead soil-pipe to earthenware pipe. A brass collar or ferrule is used to connect the two pipes, and the upper joint is "wiped." A ring of gaskin is inserted in socket of stoneware pipe, and finished with cement. This joint is the regulation one of the L.C.C.

6cwt. 3qr. Milled lead and labour in sinks and safes.

The labour may be put at about 7s. per cwt. Or—

	£	s.	d.
Milled lead per cwt.	0	16	0
Labour and solder	0	6	0
	1	2	0

18ft. run. Close copper nailing.

We may price this at 3d. per foot run.

Close copper nailing has an interval between nails of 1in.

28ft. ¾ lead pipe "middling," including bends, joints, and fixing.

This pipe would weigh a little over 2lb. per foot, and the cost would be 6d. per foot.

	£	s.	d.
Cost per foot	0	0	6
Bends and joints, fixing, say	0	0	2½
Per foot	0	0	8½

60ft. 1¼in. "middling" lead pipe, ditto.

"Middling" lead pipe of this size weighs about 4lb. per foot.

Cost per foot	0	0	10
Labour, fixing, bends, &c.	0	0	2½
	0	1	0½

20ft. run. 2in. lead pipe "middling," including bends, joints, and fixing.

Cost per foot run	0	1	8
Bends and fixing	0	0	3
Per foot	0	1	11

45ft. run. 4in. 7lb. lead soil-pipe, including joints, wall-hooks, &c.

	£	s.	d.
Cost of drawn pipe, say	0	1	9
Labour fixing, including soldered joints, soldering, and tacks, &c., per foot	0	1	3
Per foot	0	3	0

No. 2. Extra on bends to ditto, 3ft. long.

The cost would be the labour and solder. A plumber and labourer would take about three hours in making bends. Say—

	£	s.	d.
Cost of plumber, 3½ hours at 1s. per hour	0	3	6
Mate ditto at 6½d.	0	1	7¾
Solder, 1¼lb. at 1s., say	0	1	2
	0	6	3½

No. 2. Extra soldered joints in 4in. soil-pipe.

These are for the bends.

The price for labour, solder, and profit would be about 3s. 6d. It can be done at 3s.

No. 2. Lead collars to end of soil-pipe.

These would be made out of 6lb. lead.

	£	s.	d.
Cost of lead	0	0	9
Plumber's labour and solder, 1lb., &c.	0	2	0
Making good	0	0	8
	0	3	5

No. 4. Soldered branch joints to 1in. pipes, including labour and solder.

These may be valued at 1s. 9d. each.

No. 2. Ditto to 1¼in. pipe.

Add 3d. more to last.

No. 4. Tafted joints to 1¼in. pipes.

These may be priced at 1s. 9d. each.

No. 2. Boyle and Sons' "air-pump" soil-pipe ventilator, and fixing same 8in. diameter for 4in. pipe.

	£	s.	d.
Cost of 8in. ventilator	0	10	6
Labour fixing, say	0	4	0
Per foot	0	14	6

The last item can only be approximately arrived at.

No. 4. 4in. drawn lead bends 36in. by 8in. of 8lb. lead.

	£	s.	d.
Price of bend	0	18	0
Fixing solder, &c.	0	4	6
	1	2	6

No. 4. Hellyer's patent anti D-traps.

These are priced at from 7s. to 9s. each.

No. 3. Ditto for sinks and baths.

No size is given; say, 4s. each.

2½cwt. Milled lead lining cistern, with soldered joints and angles, copper nailing, &c.

The price laying lead in cisterns, including all labour and materials, may be put down at 23s. per cwt., say—

	£	s.	d.
Cost of lead per cwt	0	16	0
Labour and solder	0	7	0
Including profit	1	3	0

Line with 7lb. lead cistern to hold 200gal. with all proper soldered angles, copper nailing, &c.

To price this the quantities of lead must be taken out, and the labour, and solder, &c. A cistern to hold 200gal. will require to be about 4ft. by 2ft. 9in. by 3ft. high. Allow 1in. lap for soldered angles, and make allowance of about 1in. for turning over at the top of wood. Take the soldered angles and copper nailing round outer edges of sides and ends. There would be the following superficials:—

4 2 2 11	12	2	Bottom including laps.
2/4 2 3 2	26	2	Sides.
2/3 1 2 9	17	2	Ends.
	55	8	super. of lead.

Say 56ft. super. 7lb. lead amounts to 392lb. = 3½cwt. The items would stand thus:—

3½cwt. milled lead lining cistern.

20ft. run. Soldered angles, bottom, and sides of cistern.

14ft. run. Close copper nailing. Or—

	£	s.	d.
Cost of milled lead per cwt.	0	16	0
Soldered angles per cwt., say	0	6	0
Copper nailing at 2d. per ft.	0	0	10
Including profit	1	2	10

This is rather a high price, and for speculative work £1 per cwt. should be sufficient.

40ft. run. 1¼in. stout lead service pipe from cistern to second floor with all necessary bends, &c.

This item may be valued at 1s. 6d. per foot.

Making one hole in cistern and lead joint. Price this at, say, 2s. 9d.

No. 2. 1¼in. screw-down stop-cocks and soldered joint, with brass unions.

	£	s.	d.
Cost of screw-down bib-valve, say	0	15	0
Soldered joint	0	2	6
	0	17	6

No. 4. ¾in. brass unions, hole drilled in cistern and joints.

	£	s.	d.
Unions (brass) each	0	2	0
Drilling hole and joints	0	1	6
Each	0	3	6

In one estimate for plumber's work, this item is put down at 5s. each.

No. 4. ¾in. equilibrium ball-valves and fixing.

	£	s.	d.
These are worth about	0	5	6
Fixing and profit, say	0	3	0
	0	8	6

No. 4. Branch joints.

Say, 1s. 6d. each.

No. 1. 1¼in. equilibrium copper ball-valve (Lambert's pattern).

Referring to any large firm's catalogue, as Nicholls and Clarke's (Shoreditch), we find this pattern with screwed ferrule quoted at 15s. 6d., and fixing and joints add another 4s. Underhay's pattern with screwed ferrule is put down at 16s. for this size, and stamped by New River Co., 20s. 6d.

No. 2. Strong union joint for lead and iron, 1¼in.

This is for cistern, and is priced in the same firm's list at 4s. 3d. An ordinary plumber's union for lead pipe costs about 3s. 6d.

No. 1. Plug and washer with union for iron cistern, 2in.

This is worth from 8s. 6d. to 13s. each. The latter is of strong quality (see Nicholls and Clarke's catalogue).

No. 2. Connections of soil-pipe with drain, including lead flange out of 7lb. lead soldered to 4in. pipe fitted to socket of drain-pipe, and sealed with cement.

	£	s.	d.
Lead flange out of 7lb lead	0	1	6
Labour and solder	0	2	0
Making good in cement	0	1	0
	0	4	6

(See previous items. We presume this is a simple connection without bend or brass collar.)

No. 3. 24in. lengths of 1in. "middling" lead pipe, all bent, one end tafted and soldered, the other end soldered to soil-pipe.

These are 2ft. lengths, and are intended for anti-siphonage pipes from traps of closets.

	£.	s.	d.
Cost of 1in. pipe (3½lb. per foot)	0	1	4
Tafted end and soldering	0	3	0
Each	0	4	4

No. 2. ¾in. brass cistern connector for iron cistern, with fly nut and union and soldered joint.

Say, 6s. Cost of union joint for lead pipe is 2s. 6d.

No. 1. 1in. ditto.

About 7s.

No. 1½. Brass union and hole drilled in cistern and joints.

This may be done at about the same, say, 7s. 6d.

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MR. CHAMBERLAIN ON ART.

ONE does not look to Mr. Chamberlain for information on art. Whether his speech at Birmingham last Friday night was written by him or not, we do not know. There was an awkward pause in it at one point, and the reporters say he "turned to Mrs. Chamberlain for a suggestion." It might have been as well if some similarly helpful coadjutor had revised the whole line of argument throughout, for the conclusions seem to us singularly contradictory and badly thought out.

Mr. Chamberlain is an old hand at weaving generalities together which mean nothing. The "Ransom" speeches meant nothing. The more recent defiances to France meant nothing—at least most of Mr. Chamberlain's present political friends quickly hastened to say so. Probably the speech last Friday on Art is not to be taken more seriously.

Said Mr. Chamberlain:—"If it be true, as the late William Morris once said, that art has failed as civilisation advanced, we cannot afford to give up civilisation. Even for the sake of art, we cannot go back to these bygone conditions. Not the greatest devotee of art amongst us would desire that we should return to the general misery, the discomfort, the squalid lives which existed before this great increase of our general prosperity, even for the sake of reviving the artistic spirit; and, however ugly may be these mechanical reproductions, we cannot abandon the comfort, the health, the general happiness which has been brought about by the cheapening of articles in common use—the articles, in fact, upon which the domestic life of the masses of the people so largely depend. Then, what remains? Although, as I say, I do not think that we can go back entirely to those Mediæval times when art had its highest development, if, as I think, that high development was partly conditional upon the low condition in which the people then existed—although we cannot go back to that time, I don't for a moment say that we ought to be satisfied with our present results; and it seems to me that while we must accept the conditions of our time, while we must recognise the necessity for seeking the assistance of machinery for all the devices which will bring within the reach of the many, if not the highest works of art, at all events, something elevating, and something which may be accepted as a provisional substitute for them—still, I think such schools as that with which we are concerned may do, and have already done, a great deal to improve both the general taste and the general quality of the work which is turned out."

We hope so. We hope for more. We trust that the schools of art are doing something to make good handicraftsmanship possible; but we are certain that till a good deal of the "civilisation" Mr. Chamberlain is so enamoured with has rotted away on its own dunghill, very little good will be done. The curious thing is that Mr. Chamberlain at heart, or the person who crammed him, really believes this too! For, said he, a little later on:—

"If we are patriots in regard to the place in which we live we must have a care for its external appearance, as well as for all that is beneath the surface. And, I believe, the time is coming when the people of Birmingham will refuse to tolerate bad architecture in our midst, or sordid building. And, optimist as I am, I am almost sanguine enough to think that the time will come when they will be inclined to prefer the brightness and freshness below and the blue sky above of a Continental town, to the dirt below and the never-ceasing pall of smoke above, which, hitherto, we have considered to be the inalienable privilege of a populous and manufacturing town. That, however, is, of course, a question for the distant future, and I am falling into idealisations almost, perhaps, as excessive as those upon which I commented at the beginning of my address. Well, I am going to conclude with a quotation and a comment. It was said by a great artist that the only people in civilisation who are really happy are those whose necessary daily toil is inseparable from their pleasure. Well, ladies and gentlemen, I am not certain that, judged by that standard, there is very much of pleasure in the ordinary daily toil of the ordinary artisan. He, in the great system of manufacture which has been generally adopted, with its division of labour into infinite fractions, has to undergo the monotonous performance of the same operation, has to make the same—— [At this point the right hon. gentleman lost the thread of his sentence, and, being unable to recollect it, he turned to Mrs. Chamberlain for a suggestion.] Resuming, he said: "When I speak now I have to be extremely careful in the choice of my words, lest, unhappily, some editor may misunderstand me—but now I have got the word that I wanted. What I meant to say was that, under our present system, the ordinary artisan has to perform the same monotonous operation hundreds or thousands of times a day, day by day and year by year, during the greater portion of his life, and the unfortunate multiplication of ugly things cannot, I fear, be considered as a very elevating pursuit; but if you can, even in the slightest degree, introduce into this man's life the element of art, there comes in with it all the freshness of originality, the pleasure of imagination, and the individual interest which will add so much life to the humblest work; and in so far, therefore, as this school is performing that work, it may claim your approval and support in addition to its other merits, because it is undoubtedly adding to the happiness of mankind."

Now, that was really pretty much what Morris said—not quite so glibly, because he believed it, while Mr. Chamberlain probably only got up his sentiments for the occasion, pretty much after the fashion of Mr. Pecksniff! In his heart, he probably prefers "the cheapened articles for common use"—jerry-built houses, shoddy clothes, overcrowded railway-carriages, which the benighted 13th-century craftsman never knew—to the wholesomer life he certainly lived—when the great trade guilds probably did *almost* as much good as the trade unions do to-day, and the Master deserved his name. The men, like Morris, who want the best of those days with us once more, are quite as alive as Mr. Chamberlain to their drawbacks. When they, however, look forward to the days that shall see England cleansed of slums and healed of scars like those that fester all over the Black Country, they wait hopefully for the decay first of much of the "cheap civilisation" so dear to Mr. Chamberlain, knowing that then only can the true appreciation of "Art" revive in the craftsman.

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IS A HOUSE SEWER TRAP ALWAYS NECESSARY?*

THE writers who have in recent years discussed drainage and sewerage questions concur in the opinion that liquid domestic wastes must be conducted as speedily as possible from the plumbing fixtures in which they are formed, through the house drains and the lateral and main sewers, to the outfall of the system.

In order to accomplish this desirable result, the ideal sewage conduit is supposed to have a smooth and impervious surface, few and thin joints, sufficient and uniform gradients, good alignment with easy curves, a size not excessive in its relation to the work performed, and to be provided with efficient means of ventilation.

Those engineers who are practised in the construction of drainage works realise that these conditions are usually, but imperfectly, fulfilled, yet the desirability of approximating to them so closely as may be is not questioned.

Admitting the validity of these fundamentals of design, and comparing approved practice with such standards, we observe at once an anomalous circumstance in the presence in each house sewer line of an intercepting trap, which destroys the ideal conditions by disturbing the course of stream flow, decreasing its velocity, hastening the deposit of suspended matters, and preventing a general circulation of air through the sewers and house-drains.

Frequent objection is made to this appurtenance by the intelligent plumber, who finds it often obstructed; by the skilful architect, who is unable to fix upon a suitable location for the required air-inlet; and by the sewer engineer, who notes with a jealous eye the open ends of hundreds of house soil-pipes rendered unavailable by the prescribed construction for the ventilation of the public system.

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* By CHARLES B. BALL, M.Am.Soc.C.E., Inspector of Plumbing. Washington, D.C., in the *Scientific American Building Edition.*

While the present writer must not be understood as advocating the universal abolition of the main trap, it is his object to determine more fully the grounds on which it is stated to be a necessity and to inquire if the omission of this appliance may not sometimes be safely accomplished.

The use of an intercepting trap is based upon the assumption that it is necessary to prevent the intrusion of air from the public sewers to the house-piping system, and that varying air-pressures must necessarily occur in the sewers, which will, if freely admitted to the house lines, endanger the trap seals of plumbing fixtures. While it is unquestionable that the displacement of the air contained in public sewers by the sudden entrance of storm water is very rapid, and that compression is likely to prevail, it would seem that the most ready means of avoiding damage to the house traps would be to provide ample means for the escape of air at many points, as would be the case were every house trap omitted, rather than to convert the main sewer into a sealed chamber, the air-pressure in which must sometimes be sufficient to force the main-trap seals. The serious objections to numerous and adequate openings from the public sewers at the street level are well recognised, and such a means of securing free communication between street sewers and the outer air has been but rarely supplied.

A second objection to the omission of traps arises from the fear that the obstructing foreign matters now retained by the house trap would otherwise pass to the public sewers and cause stoppages therein. This is a real objection, especially where the separate system is in vogue, but from the point of view of most sewer designers would be more than compensated for by the full ventilation of the public system, which would take place if traps were not required.

A third and principal reason for the retention of house traps is that disease germs may be communicated through the main sewer from an infected house sewer to other house lines. We agree with a recent writer that "the air in sewers may at times be charged with malignant germs of disease," and that the "ventilation of the public system should be effected where the air would be least liable to be inhaled by the public." Is it not true that the least dangerous point for the discharge of such germs is above the house top and not at the ground level?

No authoritative statement as to how far dangers of this nature are real can be made without close observation of the operation and effect upon the public health of systems in which house traps have not been used. Notable examples of this class are found in the towns of Davenport, Ia.; Corning, N.Y.; and Newton, Mass. So far as I have been able to learn, no objection is made practically to the operation of the drainage equipment in these towns.

The main and recurring objection is to present practice, the closing of the main sewer, and, in many cases, of a considerable portion of the house drain to the most direct and available means for thorough ventilation.

It may be noted that the objection to open connection with these sewers has little force if the plumbing within each house thus connected has tight joints. The present methods of inspections and tests of new plumbing work assure this result in most cities. At all events, the integrity of the plumbing should be above suspicion, whether main traps are provided or not. If the houses are constructed of uniform height, as is usually the case in modern city blocks, or if they are isolated from each other, as in suburban localities, emanations from the soil-pipe openings cannot injuriously affect the occupants of neigbouring premises.

In two outlying districts of the city of Washington the concurrence of three conditions—viz., new and clean sewers, recently-constructed house plumbing, and the separated location of the dwellings, has been thought to justify the omission of the house running traps.

That even more radical opinions than those here expressed are entertained by eminent sanitary authorities is evidenced in a report to the Sewerage Commission of the city of Baltimore, rendered in November, 1896, by Messrs. Rudolph Hering and Samuel M. Gray, from which I quote.

"The problem of sewer ventilation resolves itself into a provision for maintaining a direct communication between the air in the sewers and the atmosphere, and in causing the entrance of pure air, and its circulation through the sewers, to be as free as practicable. The most perfect way to accomplish the above condition is to ventilate the public sewers through the house drains and soil-pipes of the buildings, to omit a main trap along the house sewer, which also acts as a retainer of foul matter, and to have perforations in the manhole covers of the public sewers. In this way an abundance of air can enter the system, not only from the outfall, but through the manhole covers, and circulate through the sewers and out through every private sewer to above the roofs of the buildings. Such a method of ventilation, however, requires that the entire plumbing in the house is planned and constructed by responsible parties, so that the work will be first-class. It is also necessary to have the house pipes tested after the plumbing is finished, so as to be assured of tight joints. This method has been tried in several cities in our country, and is the common one of the continent of Europe, but it is not the usual one in our country, for there is in the minds of many a fear that if the public sewer should be ventilated through the soil-pipe of their house some danger might arise, through a leak in their own pipes, of contracting a disease, the germs of which are supposed to come from the public sewers.

"From experience in our country, and in Europe, these fears are not well founded, and there are no facts on record to justify them. On the other hand, advantages of a thorough draft through the house pipes are considerable, and keeps them much cleaner than where a trap is placed between the house and the sewer, thus disconnecting the two. It has been said that air coming out of soil-pipes below windows of adjoining houses might cause offence, but offence could also be caused if there were a main trap and the house pipes were fouled, which they generally are not when used for ventilating the public sewers."

PARTY-WALLS UNDER THE LONDON BUILDING ACT, 1894.

At the ordinary general meeting of the Surveyors' Institution on Monday last, the discussion was resumed on the paper bearing the above title, read by Mr. P. E. Pilditch at the previous meeting.

Mr. Thomas Blashill, ex-superintending architect L.C.C., said he was not surprised at the opinion expressed by Sir John Bridge, as to the Act. The measure had, he thought, suffered in its infancy from the care of too many nurses, and in its development from the attentions of too many cooks. A good-natured committee had thought that by telling everyone what was proposed, and consulting everyone as to how it should be done, all possible cause of complaint would be removed. The result was that a vast number of amendments had been inserted in the Bill, each no doubt good in itself, but often inconsistent with other provisions, and it was now exceedingly difficult to get a grasp of the whole. He thought there was some misapprehension as to a party-wall, in that many persons spoke of "my half" or "your half" of such a wall. There was no half-ownership. It was a joint partnership in the whole wall, and the two persons should treat each other as partners. As to party-wall notices, he was afraid the practice was, or had been, general of serving such notices with, in them, everything that the Act specified, without giving the adjoining owner any idea of what it was really intended to do, which often led to litigation. The proper, and the legal, way was that the building owner should say from the very first what he really intended to do, and, if any question then arose, it could easily be settled by two surveyors with or without a third surveyor. He did not think that the third surveyor should sit as one, but that he should agree at least with one of the two surveyors who should sign the award with him. It sometimes happened that an adjoining owner put up a building—perhaps a small one—against the wall of his neighbour, who had no means of knowing what was going on. Was that wall to be treated as a party-wall when the time came for rebuilding either property? The building against the neighbour's wall was not "inclosed" with an external wall, and the original wall could not be said to separate the two buildings. Again, if an owner pulled down a house and left the party-wall standing, with no intention of rebuilding on his own side, he might shore up the wall or execute necessary repairs to it, or even for his neighbour's sake cement the face of it; but was it necessary for him to give a party-wall notice in such a case? The framers of the Act had, he thought, been too anxious to settle everything by law;—if they had left more to the discretion of the two (or possibly three) surveyors, it would have been better.

Mr. William Woodward said that until a few years ago it was the custom to serve only one party-wall notice, but in the case of "Finley v. Wood" it was decided that a notice must be served on any owner, occupier, or lessee of a building who had an interest above an annual tenancy. This involved great difficulty in finding out who these persons might be. Whether this decision was destroyed by the Act of 1894 was a question; but, according to counsel's opinion on the point which he had himself taken, it was only necessary to serve one notice either by registered letter or by affixing it to the entrance doorway of the premises. Whether this opinion was good law or not he could not say. He agreed that every party-wall notice should be accompanied by a block plan and section, showing as nearly as possible what it was proposed to do, but unless more than full particulars were given it sometimes happened that complaint was made that everything had not been specified; but he thought that if what was intended to be done were fairly and honestly set out, all objections would be met. On the question of "what was a party-wall?" the author omitted the case of a wall rebuilt and carried to a greater height than was necessary to separate the two buildings, which became, by a legal decision, an external wall above that height, with all the rights of an external wall. The Act of 1894 was particularly indefinite as to "who is an adjoining owner?" In some sections of the Act, the term accompanied by, "or occupier," seemed to include the ground landlord, the lessee, the sub-lessee, and so on, to the tenant with a three years' agreement. Two tenants, one occupying the two first stories, and the other the two second stories of a house, had, for example, an equal interest in the demolition of the party-wall, and should each have a similar notice. The wording of section 93 (s.s. 3) was hardly consistent with the wording of the ordinary underpinning section. He thought it referred wholly to underpinning within 10ft., but there was a word introduced which seemed to make one liable for any "loss" sustained by tenants—a most important alteration. He had found some difficulty with regard to the exercise of his rights within two months after an award. He agreed that the third surveyor should sit as an umpire, and be so called, and that it should not be necessary for either of the two surveyors to sign the award. With regard to appealing to the Secretary of State to appoint a third surveyor in case of the refusal of one of the surveyors to agree to one, he had found that by making a proper application he had succeeded in getting a third surveyor appointed within a week.

Mr. Frank Newbolt (barrister), said that the expression "not specially provided for by this Act," must, he thought, be understood to mean, "not elsewhere specially provided." He thought that some expressions in the Act had been inserted with the intention of striking out others which had not been struck out. He thought the surveyors had jurisdiction to act *before* the building owner commenced work, for they were given power by their award to determine a right to do any work, which they could hardly do after it was begun. The third surveyor was, he held, not an umpire in law. All three were joint arbitrators, or judges, and if the Act did not specially provide for it, their award would have to be signed by all three. Where each party had appointed a surveyor, the duty of the two surveyors was to appoint a third, and if they failed to do so the one not in default would be entitled to act *ex parte*; but it was doubtful whether this would be advisable. The question whether a surveyor acting for one of the parties was a judge or an advocate would cause no trouble to the mind of a judge; but it was very easy to argue that, under the wording of this Act, he was in the latter position. In the eye of the law the surveyor was a judge, as was laid down by Erle J. fifty years ago in the case of "Oswald v. Grey."

He saw no reason, from a legal point of view, why the parties should not be represented before the arbitrators by solicitors and counsel; but from a practical point of view, he did not think it would be always desirable.

Mr. J. Douglass Mathews said it was somewhat startling, after only four years' working of the Act, to find so many suggestions for its amendment and so many questions as to its intentions. He agreed with Mr. Blashill that too much had been conceded to too many persons in the framing of the Bill, with the result that what should have been an Act simple to interpret contained many contradictions and difficulties. He did not know whether there was any immediate probability of the Act being amended; but if an amendment should some day be made, such a paper as this would be valuable for reference and suggestion. He agreed that there was too much of the lawyer and not enough of the surveyor in the Act. Mr. Blashill's remarks about the partnership in a party-wall exactly met the situation. People were too apt to think that the portion of a party-wall on their ground was theirs alone.

Mr. H. Lovegrove said it seemed rather absurd that if a building owner pulled down a party-fence wall and on the site of it built a house, that the wall became an external wall. He could also hardly see the reason for the provision of sec. 95 dealing with party-fence walls. As to fees, he was not quite sure what remedy the surveyors had, if, after the award was made, the building owner decided not to proceed with the work or take up the award. The definition of a party-wall was vague, and it was a question whether one could put windows in a party-wall which was carried as an external wall a certain height above the adjoining roof. He has always understood that a party-wall ceased to be such 15in. above the lower building.

Mr. H. Chatfeild Clarke said that he had found among the records of an old City company, a minute instructing their carpenter to take precautions against having the walls of their buildings converted into party-walls by being built upon after the Great Fire, showing that two centuries ago people were alive to the importance of these rights. The difficulty of serving notices—party-wall notices—was a familiar one; but he thought in practice it was usual to serve them on everyone who had more than a twelvemonth's interest in the adjoining house.

Mr. E. W. Hudson, with regard to party-wall notices, quoted the decision in the case of "Hobbs v. Grover," which showed the necessity of adopting some specific wording which would show the adjoining owner exactly what it was proposed to do. The case of "List v. Thorp" was also important, as deciding that the holder of a building agreement was in the same position as if he actually had a lease. There was a considerable discrepancy between the Acts governing buildings in the provinces and in the metropolis which the Royal Institute were endeavouring to have removed. The case of a party-wall carried above the building of an adjoining owner and so becoming an external wall was one full of difficulties, the case of "Williams v. Bell" governing the matter in London. It hardly, however, came up to his ideas of strict equity, though doubtless it was good law. The Crosby Hall case ("Davis v. Marks") settled many very important points, and was worth careful study.

Mr. Pilditch, in reply, said it was impossible at a late hour to attempt to deal with all the points which had been raised. He thought that section 91 of the Act certainly gave the surveyors power to settle, from time to time, any points which might arise during the continuance of the work. He could not agree that it was impossible for a building owner to state beforehand just what he would require to do. Mr. Pilditch proceeded to deal with the appointment and status of the three surveyors, and said that he was glad to hear from Mr. Woodward that there was no difficulty in getting a third surveyor appointed by the Secretary of State in the case of one side refusing to nominate.

The President, in summing up, said that the history of the Building Act was one in which the Institution had taken great interest, and he thought that Mr. Blashill's description of its early days showed exactly what had been the cause of many differences between it and the previous Act. The distinction between London and the country in respect of party-walls was an important one; but he thought it would be difficult to get the country people to agree to adopt the London regulations as to such matters. He thought that the two surveyors could scarcely be mere arbitrators, but must remain professional men engaged each on behalf of his own side.

THE STATUTORY REGISTRATION OF ARCHITECTS.*

By Ellis Marsland.

In opening the subject for discussion this evening, I am very glad to see so large a number of what I am going to term the backbone of our profession—viz , the younger members, as this question of registration will have to be fought out and carried to a successful issue by them and them alone. I have come to the painful conclusion that the older a man gets and the faster his commissions increase the more selfish does he become professionally and less mindful of his duty to his brother architects, and the less interest does he take in any matters affecting the welfare of his profession. In introducing this question, I must necessarily go over some ground with which you must all be familiar and define what we mean by Registration. In the present it means that every man practising architecture shall be duly enrolled in an official register under an Act of Parliament, and be duly responsible for his professional actions, and that no one be allowed to practise until he is duly enrolled. In the future it means that no one be allowed to practise architecture until he is duly qualified and has been found so by undergoing a qualifying examination. It means, in fact, little more than making the Institute examination compulsory by Act of Parliament. It is a matter for surprise that this obvious benefit should not have been secured to the profession long ago, seeing the advantage it has been to the learned professions of law and medicine. It is not my intention to-night to say one word by way of recrimination against the Institute; but I would just like to point out how far they have gone in the direction of registration. On May 30, 1890, it passed the following resolution:—"That while not opposed to the principle of compulsory examinations as applied to those about to practise architecture, the Institute is of opinion that the difficulty of restricting by statutory powers the practice of architecture to those who have passed an examination is at present so insuperable, that it is undesirable to make an immediate application for such powers." To what does this resolution amount but the admission that the principle is a good one, and that the difficulties in the way are the only bar to progress? Why do we band ourselves into societies and associations unless it be for the express purpose of overcoming difficulties and bringing about reforms for the general good? This inactivity is placing the Institute in a false position, and is causing a vast amount of dissatisfaction, especially among provincial members, as the want of such a measure of reform is felt far more keenly by them than by us. Of what use is it for the Institute to say that their examination is a panacea for the existing evils, unless this examination is made compulsory? Until men find that by undergoing a course of study and passing an examination, they are placed in a better position in the eyes of the public than the man who possesses no qualifications at all, it is very unlikely that an appreciable number of men will voluntarily come forward and avail themselves of this means of entering the profession. Now the position of the practice of architecture at the present time is this: Any person with or without a fair general education, any builder, builder's foreman, clerk of works, clerk in a Local Board office, auctioneer, undertaker, &c., with the sole qualification of being able to provide a brass plate, is at liberty to advertise himself as a person qualified to give advice to the public in the science and art of architecture. Builders, decorating firms, and others, going out of their proper province, boldly proffer their services as architects to their customers gratis, and the apparent saving of 5 per cent. is not be resisted; while it is well known to those behind the scenes that an architect or architectural assistant is devilling in the back ground and his services are kept out of sight, but the customer has to pay all the same. Can it be a matter for wonder that architects are still unrecognised while such a condition of things exists, for at present the public have no guarantee that the class who call themselves architects are any better qualified to plan and design their buildings than the contractors who erect them, and should they employ an architect they have no means of ascertaining that his knowledge is greater than that of the builder, and the only certainty about it from their point of view is, they will have to pay the professional charges. But what the Institute have omitted to do the general body of practitioners are endeavouring to do for themselves. On April 6, 1886, a meeting of architects was held in Freemasons' Tavern in London, attended by members of the Institute, Society of Architects, and by practitioners not connected with any society, and a committee was then formed, called "The Architects' Registration Committee," to give effect to the following resolution then and there passed:—"That it is the opinion of this meeting that instructions be given to the committee to consider the means necessary to obtain an Act of Parliament making it compulsory for all architects to hold a Government diploma." This committee was composed of Institute members, members of this society, and independent members, who set to work and eventually framed the Bill at present before Parliament. There is an erroneous opinion abroad that this is the Society of Architects' Bill, and I wish to correct this impression. That the Bill receives its cordial sympathy and support is no secret; but it is not the Bill of this Society and never has been, and the Society reserves to itself the right to be heard in Committee when this stage is reached with a view to certain amendments. The Bill is carefully drawn on the model of the Medical Acts, but its details need not be gone into to-night, as this discussion is upon the general principal of registration, and not upon the details of any particular Bill. To put the matter shortly, the advantages arising from registration are these: Closing the doors to incompetent men; raising the standard of the profession; obtaining the confidence of the public and State recognition. It is not proposed for one moment to say all who desire to build should employ an architect; but what we do propose is that henceforth, in the interests of the public, no person shall be entitled to call himself an architect whose name is not enrolled as qualified under an Act of Parliament, and any person wishing to employ an architect, may, by consulting the Official Register, ascertain what men are qualified. I will now deal with the objections. Objection has been urged against the movement that it will create a monopoly, and thus be opposed to the principles of modern legislation; but there cannot be a monopoly created where it is made possible for anyone who proves himself qualified to share the rights. Another objection is that it will be necessary at the outset to register some of the very men who have caused all the mischief. This is very true, and unless this is done, it will be found that Parliament will not listen to you. That you must respect vested interests is an axiom of Parliamentary practice, and where a man can show that he has practised architecture, Parliament will say you must not deprive him of his rights, and the obstinate attempt to exclude this principle from the Medical Act was the chief cause of delaying its passage through Parliament for thirty years. Another conscientious objector is the artist-architect, and I should like to introduce you to this gentleman. Outwardly he is an individual with long hair and a red tie who has a dreamy, far-away look which rude people call vacancy, and drivels about his beloved art and its soul-inspiring influence; he cannot demean himself to consider such questions as rights of light or party-walls, all of which he considers do not come within his province, and are relegated to the mere surveyor. His specifications are left to the quantity man, his construction to the builder, or clerk of works, his sanitary work to the plumber, and his lack of acquaintance with the building by-laws is painfully brought home to him when he discovers his pretty pictures cannot be realised. His time is spent in his office making drawings impossible of execution or else in designing sprawly wall papers or uncomfortable furniture. This is the gentleman who tells you the art of architecture requires none of your registration; that you are only lowering its dignity by making it a profession. But, gentlemen, I maintain that at the present time architecture is trailed in the dust at the heels of many men who are unworthy of the title of architect, and by a scheme of education and registration we shall raise it above its present unsatisfactory surroundings to such a height as will at least bring it to the level of the learned professions, and after this has been attained then develop and foster the artistic side as much as you will and the more the better. That you cannot examine a man as to his artistic attainments, is partly true. But a painter is no less a painter because he has been instructed in the science of perspective, or in the proper manipulation of his colours and their chemical composition. Or a sculptor is none the worse for a complete course of study of the anatomy of the human figure. We do not of course claim that architects can be manufactured from study and examination; but what we do claim is that there is a constructional, hygienic, and scientific side to this question, which is of quite as much importance as the artistic, but which, unlike the arts of painting and sculpture, affects the comfort, health, and well-being of the community, and this being the case, the men who take upon themselves the responsibility should prove themselves competent. When we dislike a picture it can be relegated to the garret or given away to our friends. When a piece of sculpture displeases us a few blows with a hammer, and it is made useful for the garden path. But it is a much more serious matter with our dwelling-houses if, when erected, whatever their architectural merit may be, they are found unfit by reason of the wrongful disposition of the rooms or fireplaces, faulty construction, or the sanitary arrangements are unsound and ill-ventilated. The question of architectural taste is always a changing quantity, and what may be one man's meat may be another's poison in this respect, so that it is not pretended that it is desirable to examine on the artistic side of architecture, even if you could find artistic examiners who would be agreed on any one point. The first effect of a Registration Act would be to put a stop to any further increase in the number of incompetent practitioners, and thenceforth they would become a diminishing quantity. Those who have carefully studied this question from its various aspects, I venture to think, have already come to the conclusion that such a measure of a reform as I advocate to-night is urgently needed, and its urgency will be increasingly felt, and I appeal to the gentlemen present to assist the Committee who have the conduct of the Bill by every means in their power to bring it to a successful issue.

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* Read before the Society of Architects, Dec. 14, 1899.

THE PARLIAMENTARY BILLS OF THE LONDON COUNTY COUNCIL.

THE London County Council, on the recommendation of their Parliamentary Committee, have approved of no less than nine Private Bills, in addition to one Bill which has already been submitted to the Council. The matters dealt with comprise several important schemes, and are more numerous than in any previous year of the Council's existence. They also formally approved a General Powers Bill dealing with the following, among other matters:—Purchase of lands in the liberty of Saffron Hill and in the parish of St. Andrew, Holborn, as sites upon which to rehouse persons of the labouring class displaced under the London (Clare Market, Strand) Provisional Order Confirmation Act, 1897, and under the County Council (Improvements) Act, 1899, authorising the formation of a new street from Holborn to the Strand; purchase of open forecourts or pavements in front of certain houses in the parish of Battersea required for the purposes of the Battersea Park-road widening, authorised by the London County Council (General Powers) Act, 1897; purchase of land for the extension of Newington recreation-ground; purchase of the garden of Albert-square, Commercial-road, for the purpose of public recreation; contributions by the Council and the Vestry of Hampstead towards the purchase of the Dollis Hill Estate in the parish of Willesden, for the purposes of public recreation; and purchase by the Council of the Ranger's house, Greenwich, for use as a shelter or refreshment house.

In the Council's Improvements Bill power is sought with respect to various matters, including the Thames Embankment extension and improvements at Westminster. A proviso is included in the Bill to make the carrying out of the improvement subject to a contribution of £100,000 by the city or borough of Westminster, constituted by the London Government Act, 1899. Provision is included as to rehousing persons of the labouring class who may be displaced by the carrying out of the several improvements, and as to applying a betterment charge in the case of the Thames Embankment extension, &c., improvement, and of the widening of High-street and Gardener's-lane, Putney.

The Council further approved the London Water (Purchase) Bill, prepared to give effect to the resolution of the Council on November 7 last as to the promotion of a Bill in the Session of 1900 for the purchase by the Council of the undertakings of the eight Metropolitan Water Companies upon similar lines to those of the Bill presented to Parliament last Session. The arbitration clause in the Bill is the same as that of last year, but, in consequence of the procedure of the Royal commission, the Committee have somewhat modified Parts VII. and VIII. of the Bill as to the management of the water undertakings, when purchased, and as to supply in districts outside London. The London Water (Welsh Supply) Bill has been prepared to give effect to the resolution of the Council as to obtaining an additional supply of water from the watersheds of the rivers Wye and Towy. With several minor alterations, the Bill practically consists of an amalgamation of the two Bills of last Session. The estimate in the Bill, however, which has been inserted on the recommendation of the Water Committee, amounts to £18,100,000, whereas the total expenditure provided for the Bills of last Session amounted to £17,000,000. The engineer and valuer have pointed out that the increase thus shown is necessitated by the great enhancement in the price of all kinds of materials and labour which has taken place during the last 18 months.

ROYAL ACADEMY SCHOOLS.

THE following is a list of the prices awarded this season to students in the schools of the Royal Academy. A critical review of the drawings and designs appears on p. 789 *ante*, and the prizes were distributed on Saturday evening by Sir E. J. Poynter, P.R.A.:—

Historical painting (Ladas, winner of the long foot-race at Olympia, falling dead as he goes to receive the crown of victory), gold medal and travelling studentship (£200), Frank Moss Bennett.

Landscape painting ("The Incoming Tide"), Turner gold medal and scholarship (£50), Fred Appleyard.

Landscape painting (A Path through Trees), Creswick prize (£30), Arthur Gerald Ackermann; *proxime accesserunt*, William Denis Eden, Millicent Etheldreda Gray.

Painting of a figure from the life (open to male students only), silver medal, 1st, Francis Edward Colthurst; silver medal, 2nd, Oswald Crompton.

Painting of a head from the life, silver medal, 1st, Fred Appleyard; silver medal, 2nd, Christopher David Williams.

Painting of a draped figure (open to female students only), silver medal, 1st, Florence Eleanor Chaplin; silver medal, 2nd, Harriet Eleanor Thomas.

Cartoon of a draped figure (Justice) silver medal and prize (£25), Frank Cadogan Cowper; *proxime accessit*, Maud Marian Wear.

Design in monochrome for a figure picture (Abraham about to sacrifice Isaac; Genesis, chap. xxii. 9-13), Armitage prize, 1st (£30) and bronze medal, Fred Appleyard; Armitage prize, 2nd (£10), Charles Gilbert Joseph Holiday; extra prize (£8), George Murray.

Design for the decoration of a portion of a public building (Spring driving out Winter), prize (£40), Fred Appleyard.

Set of six drawings of a figure from the life (open to male students only), 1st prize (£50) and silver medal, not awarded; second prize (£25), James Philip S. Streatfield; third prize (£15), Frederick George Swaish; 4th prize (£10), Christopher David Williams (disqualified owing to having received a superior prize in the same competition before).

Drawing of a head from the life, silver medal, 1st, Frederick George Swaish; silver medal, 2nd, Gertrude Lindsay.

Drawing of a statue or group, silver medal, 1st, Frederick George Swaish; silver medal, 2nd, Frank Samuel Eastman.

Perspective drawing in outline (open to painters and sculptors only) (the staircase leading to the Exhibition Galleries, as seen from the entrance-hall of the Academy), silver medal, no competition.

Composition in sculpture (Æneas leaving Troy), gold medal and travelling studentship (£200), Gilbert William Bayes.

Model of a design (A Greek Soldier Protecting a Wounded Comrade), 1st prize (£30), Arthur Charles White; 2nd prize (£10), Mortimer Joh Brown.

Set of four models from the life (open to male students only), 1st prize (£50) and silver medal, Alfred Bertie Pegram; 2nd prize (£20), Charles Leonard Hartwell.

Design for a medal (Saving of Life at Sea; reverse—an ornamental shield, with space for inscription), silver medal, no competion.

Model of a bust from the life (open to female students only), silver medal, 1st, not awarded; silver medal, 2nd, Winifred Florence Hunt (disqualified owing to having received the same prize before).

Model of a statue or group, silver medal, 1st, Charles James Pibworth; silver medal, 2nd, Mary Constance Buzzard.

Design in architecture (A Public School for 200 Boys), gold medal and travelling studentship (£200), Horace Charles Hide.

Set of architectural drawings (Four Bays of the S.E. Angle of the Cloisters of Westminster Abbey), silver medal, 1st, Francis Winter Newman; silver medal, 2nd, George Thow Smith.

Set of architectural designs (upper school), prize (£25), Harry Inigo Triggs.

Set of drawings of an architectural design (lower school), prize (£10), Francis Winter Newman.

Plan of a building (A House in a London Street between party-walls), prize (£10), James Black Fulton.

Original composition in ornament, silver medal, no competition.

Perspective drawing in outline (open to architects only) (The Three Central Bays of the Front of Whitehall), silver medal, no competition.

The Landseer scholarships in painting and sculpture of £40 a year each, tenable for two years, have been awarded—in painting to George Murray, Fred Appleyard, and Ernest Howard Shepard (extra); in sculpture, to Arthur Stanley Young and Harry Price (extra).

CORROSION OF WATER-PIPES BY ELECTRICAL CURRENTS.

IT is, no doubt, unfortunate, but, at the same time, equally inevitable, that the practical application of all new and advanced scientific principles in the interests of the comfort, convenience, and welfare of the community at large should be invariably accompanied by a certain number of drawbacks or obstacles, which must be either removed or nullified before any real progress can be recorded. The exercise of a considerable amount of patience, ingenuity, invention, and skill is frequently demanded before the way is cleared; but the attempts in the long run are pretty sure to be successful. In the development of electrical railways and tramways a new source of apprehension and disquietude has arisen, which, if not checked, may be fraught with grave consequences to all pipes of metal laid beneath the surface of our roads, streets, and the thoroughfares of all our towns and cities. The whole question, sufficiently indicated by the title of our article, has now assumed a phase which calls for public attention and consideration, and, consequently, in the following brief account we bring the matter to the notice of our readers. As some proof of the urgency of the case, it may be mentioned that the evil has attained to such proportions in the United States that an electrical expert of eminence has been specially appointed to investigate and report upon the whole subject. He has also been instructed to ascertain, as far as possible, what measures should be adopted to mitigate or entirely prevent the present damage by corrosion to underground metallic pipes by the action of return electrical currents. It will not be necessary for us to refer to any purely technical details in our short *résumé*, but simply to allude to the general principles of electricity with which all are now familiar.

It was about eight years ago that in the city of Boston in the United States, the effects of the electrolytic action of the return current of electric tramways was observed for the first time upon the leaden pipes in which telephonic wires were laid. Some years later in Brooklyn, upwards of three hundred miles of similar lead-piping were so seriously attacked that they became perfectly useless, and had to be removed and replaced by others.

It is well known that in, for instance, an ordinary electrical tramway belonging to the overhead or trolley system, the current starts from one of the poles of the dynamo, and follows the course of the overhead wire until it arrives at the tramcar. Passing downwards towards the axle of the wheels, it sets the motor in action, and then using the rails as its home conductor, finally returns to the opposite pole of the dynamo from which it started. So far, everything is quite satisfactory, and confirms a well recognised fact, that the simple transit of an electric current through metallic water-pipes is not *per se* productive of any injury or damage of any kind. Were this statement not fully established, electric tramway companies would never have been allowed, as they have been by the municipal and local authorities of towns, to use, when they wanted, the water-pipes as return conductors for the current. Here is where the mischief comes in. When the return current is passing along the rails, it constantly occurs that it, or at least a portion of it deserts its natural conductor the rails—so to call them—leaves its normal circuit, and attaches itself to any underground conductor that may accidentally come in its way. This abandonment of its proper conductor and the taking up of another not in connection with its own normal circuit, will in many cases give rise to electrolytic action, attended with corrosive deterioration. It appears that a very small difference of potential is required to enable a current to pass from one conductor to another through an intervening space, particularly if the ground be of a damp description.

In addition to the existence of the underground currents themselves, electrolysis and corrosion will not take place without the active interference of other agents. The presence of soluble salts, consisting chiefly of the nitrates, the sulphates, and the chlorides, is imperative, and the magnitude and intensity of corrosion produced depends not only upon the strength of the current, but also upon the proportions in which the salts are present in the soil. It frequently happens that a very small quantity of the salts is sufficient to start the evil, which will continue contemporaneously with the existence of the current itself. The corrosive effect that the nature of the soil in combination with the electric current has upon metallic pipes is well evidenced by the fact that in Kansas a length of pipe, 6in. in diameter, when taken up was found to be so terribly corroded that it was easily cut through and chopped up in pieces by an ordinary knife. In this district the deterioration of the pipes proceeded at such a rapid rate that in many localities the pipes were renewed nearly every six months. Up to recent date, it has usually been taken for granted that the electrolytic corrosion of pipes was restricted to their external surface; but subsequent experiments have disproved this fallacy, and the existence of internal corrosion is thus accounted for. At the joints of the pipe, owing to the greater thickness and the greater amount of metal, the resistance to the transit of the current is increased, and becomes much stronger than that of the body of the pipe. When it arrives at a certain intensity the current, in attempting to pass from one part of the pipe to the other, seeks naturally an alternative and less resisting path which is open to it, either *viâ* the soil, or the water in the pipe. If then, as often occurs, the water flowing through the pipe should contain even a minute quantity of the soluble salts already enumerated, electrolysis supervenes, and the damage is effected in the interior of the pipe as well as on the exterior, on the assumption that a part of the current might pass by the one route, and the remainder by the other. In support of this statement, which is no doubt perfectly accurate, it may be mentioned that a very careful inspection and examination of several lengths of pipes in Brooklyn, where the water is singularly destitute of soluble salts, detected no signs of internal corrosion. On the other hand, at Kansas City, a locality in which the water supplying the population is rich in salts, pipes 6in. in diameter were found quite incrusted on the internal surface. To such an extent was the corrosion carried, that when some of the pieces chipped off were submitted to analysis, they were found to contain 23 per cent. of carbon, whereas the normal proportion varies between 2 and 5 per cent. It is obvious that this great surplus quantity of carbon must be accompanied by a corresponding reduction in the metal, due to electrolytic action.

A crucial test was undertaken, which may be considered as both conclusive and unimpugnable. A piece of perfectly clean and unused tubing 4in. in diameter was placed in a bath impregnated with soluble salts, and a current of 20 ampères passed through it. At the end of three or four hours the corrosive influence was strongly apparent, and the parts attacked evinced 30 per cent. of carbon. Some valuable and interesting experiments were also made with the object of ascertaining the actual ratio between the respective resistance of the joints and that of the body of the pipe. Without entering into the question of the electrical units employed, it will be sufficient to mention that the resistance of the joints was found to be a couple of hundred times greater than that of the pipe itself. Taken altogether, these facts establish beyond all possible doubt that internal corrosion does take place in water-pipes. It is also true that the process is considerably slower than when the deterioration attacks the outside, and it is, moreover, more difficult to detect; but given a certain proportion of soluble salts in the water, and a sufficient resistance in the joints to the passage of the current, the one result is as certain as the other. Besides, from its comparative slowness of growth, and its insidious character, internal corrosion is really more to be feared than external, though each is in itself sufficient to account for an enormous amount of damage inflicted upon water-pipes. While there are certain remedial measures in the form of palliatives available for the treatment of the evil, there is only one real remedy which constitutes the moral of the whole subject—do not allow your water-pipes to be traversed by electric currents. T. C.

THE BRICK TRADE.

If one could believe the statements put before the public, a brickfield must be a veritable El Dorado. The prospectus of the Woolpit Brick Company, as to which we wrote about on November 24, promised an annual profit of £25,000 on a capital of £100,000. Fletton, Limited, which was promised us by the *British Clayworker*, has not yet appeared on the market; but, from our knowledge of those anxious for its inception, we feel sure that the inducements held out to the public will be very tempting. In the mean time we are told of another new brick company "in course of preparation for the consideration of the investing public." The prospects held out in this case exceed anything we could imagine or conceive from the comparatively simple process of burning clay into bricks. "The capital is to be £100,000, in shares of £1 each," so that the very smallest investor can participate, "and an issue of 60,000 shares is contemplated." The profit per week is put down at £1,292 10s. (note the accuracy which descends to shillings), and calculated on a working year of 45 weeks (why it should not be 52 we are at a loss to understand), shows a profit of £58,140 per annum. Further, we are told that "what is believed to be a thoroughly practical directorate, will include a gentleman of large financial experience, and the manager of a well-known range of brickfields." Tempting indeed!

Again, we ask why do not the promoters keep this for themselves? If their figures are correct, there would be little difficulty in the City of London in finding the money, even with the bank rate at 6 per cent. Surely the "responsible firms" who, according to "the statement of the directors," have given an option of 245 million bricks—an enormous figure—would be only too glad to find the capital required, being allowed in return even a moderate share of the profits.

The reports to the directors appear to have been made by a Mr. Cheesewright and a Mr. Parker. Mr. Cheesewright is described as M.I.C.E.; but, as far as we can find out, he is not known in the brick trade—at any rate, as far as London is concerned. Mr. Parker we do not know either, unless he is the gentleman described in the first prospectus of the Woolpit Company as a gentleman of large and varied experience, not only in England, but in the United States and Canada.

Further, the shareholders in this wonderful company are not only to depend upon bricks for their 100 per cent. per annum return on the capital, but are to have *the benefit of a hay crop*, which this year, it is stated, produced over 230 tons, and also of an output of 600 tons of cement per week, the cost of which, it is stated, is 17s. 9d., while the selling price is put down as 38s. per ton.

We are afraid our readers having read thus far will imagine we are romancing. We assure them we are not, and would refer them to the *Financial News* of Nov. 20. Of course, the *Financial News* may be poking fun at its readers; but it is hardly likely a paper devoted to so dry a subject as finance would do so. We therefore accept its article as written in all seriousness.

What is this Company, and where is it situated? It is called the Althorne Brick and Cement Company, and it has been formed for two objects. "For acquiring, working, or otherwise dealing with—

"1.—The freehold estate consisting of 442 acres or thereabouts of clay-bearing land, and about 70 acres of saltings, making a total of 512 acres, situated at and known as Bridgemarsh Island, being about a third of a mile from Althorne Station on the Great Eastern Railway, and three miles west of Burnham-on-Crouch, Essex.

"2.—Also the goodwill, plant, and machinery, six cottages, large and commodious dwelling-house, stabling, workshops, outhouses, property now upon the premises."

Those who were in the brick trade in the 70's and 80's will recollect the River Crouch Brick Co. For some little time it made a small quantity of bricks, the principal quality of which was their uncommon lightness. In the trade it was popularly supposed they would float if thrown into water. The company did not succeed; at any rate, it ceased working.

We have taken some little trouble to look into this new venture. There are brickfields in South East Essex, notably at Wakering, Shoebury, and Southend. The clay is the famous Malm earth, from which are made the best Stocks supplied to the London market. They are all made by hand. When the river Crouch is reached, the geological formation is quite different. We come there to the stiff London clay, which has never yet made a brick of good quality, and, in our opinion, never will. Further, a very short distance below the surface water is come to, so that the clay is what is technically called waterlogged, and is only found in pot-holes.

With regard to object No. 2, quoted above, any intending investor who will take the trouble to pay a visit to the site of the proposed works will find one new brickmaking machine, also six cottages and a foreman's house, and a large drying floor—he will find them unoccupied and not in the best repair—a traction-engine, and, further off, an old Cornish boiler and the ruins of a wash-mill, also some stabling, unoccupied; and if he searches very diligently, he may discover two close kilns of a primitive type, and grass-grown. Seeing that the brickfield was last at work three years ago, we cannot see how any value can be put on the goodwill.

The cost of making bricks is stated to be 12s. 3d. per thousand. We are perfectly certain no brick was ever yet made in Essex at such a price. The cost is nearly double. The selling price is estimated to be 35s. per thousand. Now, the last prices noted by the Kent and Essex Brickmasters' Association are Stocks 36s., Grizzles 33s., Roughs and Place, 28s, and these prices are, *delivered in London*. To arrive at the prices at the works the freightage and loading must be deducted, equivalent in this case to 6s. or 7s. per thousand at least. So the selling price of 35s. must manifestly be wrong.

With regard to the cement works which are to give a profit of nearly £600 *per week*, we do not know who Mr. Hazell is who reports on the Portland cement works, but he overlooks several important facts. It is popularly supposed that Portland cement is made of blue clay, which is true; but there is another ingredient wanted, and that is chalk. Chalk is much more largely used in the manufacture of cement than clay. There is certainly no chalk to be found either on the River Crouch or Bridgemarsh Island. The nearest point is Grays. The largest cement works on the Thames and Medway have their own supply of chalk at their works. The cost of taking chalk from the Thames or Medway to Bridgemarsh Island, there manufacturing it into cement, and bringing it to London as the manufactured article is prohibitive. Further, the freightage on cement from the Thames to London is 1s. to 1s. 3d. per ton. From the Crouch it would be at least double. The selling price is given at 38s. per ton. Now we have proof of a quotation given by a large manufacturer within the last few days at 24s. per ton.

Mr. Hazell ends his report by saying that "for the export trade everything is in your favour." What he means by this we are at a loss to know. We should be sorry for any steamer or sailing ship of moderate draught that tried to load cement at Bridgemarsh Island. She would never get out of the river. That there is deep water in the river we know, but there are also the Maplin and Buxey Sands, and that part of Essex is probably the most difficult piece of navigation on the whole of the East coast.

The estimated cost of manufacture and selling being so far from correct, the estimated profits necessarily fall to the ground. The profits are only estimated. There are no satisfactory results in the past that can be shown. Everything is to be in the future—that is to say, the plant for 27 million bricks and 27,000 tons of cement a year, has yet to be put down. By the time these gigantic works are in full operation it may be fairly asked what is likely to be the condition of the two trades dealing with brick and cement? As far as the brick trade is concerned, its prospects since we last wrote are not brighter, but the reverse. There seems every probability of another fall in prices, and such a fall as will bring the profits even of the old-established manufacturers to the vanishing point. With regard to cement, there has also been a fall in prices, and the prospects for next year are by no means bright.

From the quality of the clay, the situation, the cost of manufacture, and especially the cost of freight to London, we cannot see how this proposed company can successfully compete with its more favoured rivals who are better situated, and who—a very important fact—have had the benefit of some fat years to enable them to meet the oncoming lean ones that are sure to arrive, and we think soon.

In conclusion, we would ask the Editor of the *Financial News* to verify the statements made in his article of November 20. We think it is a duty he owes to his readers, and we feel sure it is his desire not to mislead them.

RELATIVE VOLUME OF PORTLAND CEMENT MORTARS.

Since about the year 1886 numerous experiments have been undertaken with the object of definitely ascertaining the effect produced by variations in the volumes of mortars composed of Portland cement, one of the greatest constructive materials ever placed at the disposal of the architect, the engineer, and the builder. It was not, however, until very recently that the experiments were extended to the investigation of the same subject in connection with armoured concrete and masonry, which have been applied to so many purposes with perfect success as to constitute a veritable new type of construction. It should be mentioned that the introduction of the metallic element in the mass seriously complicates the whole question, and gives rise to the development of internal stresses. Evidently, therefore, in order to thoroughly study the matter, it became imperative to conduct the experiments upon a duplicate system, so as to institute a comparison between armoured and non-armoured specimens, which has been just effected by M. Considère, with results that are both sufficiently interesting and instructive to deserve a short notice and description. The test specimens took the form of prisms armoured and unarmoured. Some were immersed in clean water, and others exposed to the action of the open air, and all variations of their length were recorded by means of a micrometer screw reading to 0·0004in.

Commencing with the test samples placed in water, four were manufactured, their dimensions being 2·4in. by 1in. by 2ft. in total length. Two of these prisms were composed of pure cement mortar, and the other two consisted of cement and sand in the proportion by weight of nearly one of the former to two of the latter, which is a very usual admixture for specimens made for the purposes of testing. One prism of each separate pair was unarmoured, and the others reinforced by the presence of a rod of iron 0·4in. in diam. passing through its vertical axis. One of the first results established was that the elongation of the prisms was not a matter of mere haphazard, but that their extensions obeyed a regular law, accompanied by a daily diminution in the rate of elongation the longer the specimen was under trial. These experiments, which will be further continued, and to which we shall again refer, lasted for two months; but by comparing them with similar tests carried out during some years both in France and Germany, the following conclusions may be fairly relied upon as furnishing a good average satisfactory conclusion. The elongation of the sample pieces of pure unarmoured Portland cement mortar immersed in clean water, amounted to 0·02in. in one month, to 0·04in. in a year, and to 0·08in. at the end of three years. It should be observed with attention that the dilatation of the specimens composed of sand and cement were three times less than that of those of pure cement. It was also ascertained with respect to the armoured samples, that the metallic rods acted like regular dynamometers, and registered very faithfully by their extension the amount of stresses which brought about their elongation. The whole investigation demonstrated that the metallic material in the prisms immersed in water take a far greater portion of the tensile stresses, which is just what is constructively wanted in the combination, than is usually allowed for. There can be no doubt that this extension, which places the metallic rods, bars, or whatever other section may be employed, under an initial tensile stress, is of great advantage to this compound type of construction. It imparts to mortar of pure cement a superiority over all others in the case of armoured samples under water, owing to the fact that its dilatation is considerably in excess of that of all other mortars and concretes.

We have now to consider the case of the prisms of simple mortar and cement exposed to the action of the air, which, instead of expanding, are subject to contractive forces, and, in addition, do not follow any regular law, or what is termed any mathematical series. But, in contradiction to these examples, the results obtained for armoured prisms of pure cement demonstrate unmistakably that they contract in accordance with a well-defined and regular law, and that they differ in this respect from the unarmoured cements. It has been also proved that the internal tensile stress, which is developed without any apparent signs of injury in a prism of cement by the action of the metallic combination with it, approaches very closely to the breaking-stress of an armoured specimen of the same age. It is evident, therefore, that the armoured concrete, to use its best known term, possesses certain qualities which are not to be found in the ordinary simple material. If it were not so, there would not have been so many examples of large span bridges constructed abroad upon that system, and it is a little difficult to account for the fact that hitherto the principle has not been applied to any extent worth mentioning among ourselves.

T. C.

REFUSE DESTRUCTORS.

At the ordinary meeting on Tuesday of the Institution of Civil Engineers, the paper read was on "Combined Refuse Destructors and Power Plants," by Mr. C. Newton Russell, Assoc.M.Inst.C.E. The paper dealt with the subject of refuse destruction, particularly in reference to its employment for raising steam; and gave details of ten combined plants, the data of which all tended to prove that a considerable amount of energy in the form of heat was to be obtained from the burning of ordinary domestic refuse. The results obtained from eight combined plants in England and two abroad were given; the Shoreditch plant being dealt with in considerable detail, as being the largest of its kind in operation. The total amount of refuse destroyed during a period of twelve months was about 26,000 tons, of which 92 per cent. was ordinary domestic refuse, and 8 per cent. trade refuse, consisting of straw, paper, &c. The latter was practically useless for steam-raising. The plant consisted of six Babcock-Willcox water-tube boilers and twelve refuse-furnaces of the Manlove-Alliot type, each boiler being placed between two refuse-furnaces, the hot gases from which were led into the boiler-tubes through short side-flues, each boiler being provided with a special grate, on which coal might be burned if required. The refuse, on arrival at the works, was carefully weighed, and was afterwards shot, without sorting, into trucks, which were raised by electric lifts (of which there were two) to the top platform. On arrival at this point the truck, which was on wheels and fitted with an electric motor, was run off the lift, on the overhead-trolley system, to any position where it was desired to empty it; the refuse was then tipped into special charging trucks, one of which was provided for each furnace, and which was operated from the top platform by means of chain gearing. The average amount of refuse received per day was 84 tons, delivered between 9 a.m. and 5 p.m., although as much as 140 tons had been received in one day. It appeared to be impossible in ordinary working to guarantee a regular supply, and it was advisable to provide means of storage to cope with extra large deliveries. This difficulty was met at Shoreditch by means of a large rectangular iron storage bin fixed under the tipping platform, and holding about 60 tons of refuse. The lifts and trucks were operated entirely by electricity. Forced-air draught was supplied to the fires by electrically-driven fans, the pressure in the ash-pits being 1in. of water. No coal or other fuel was mixed with the refuse, which burnt freely: the maximum temperature observed being 2,500° Fahr., and the average 1,500° Fahr. Considerable inconvenience was experienced owing to cold air rushing into flues during clinkering operations, the trouble being, to a great exent, unavoidable, and calling for a perfect system of dampers. The clinker residue amounted to 32 per cent., and was at present difficult to dispose of owing to the cartage from works to the outskirts of the town being high. The clinker was suitable for making mortar-concrete, and, when ground and mixed with Portland cement, made excellent paving slabs. The works were managed on the eight-hour shift system, seven days per week. The feed-water for the boilers was drawn cold from storage tanks by three-throw pumps, which forced it through economisers placed in the main flues, where it was raised to a temperature of about 200° Fahr., depending upon the heat of the flue-gases and condition of economiser. The water was then forced upwards into a large feed-water storage cylinder, 30ft. by 8ft., fixed about 20ft. above the boilers, and was connected direct to the main steam line, and which was therefore at the same temperature and pressure as the boilers, which were fed directly from this cylinder by gravity, the water flowing into the boilers freely without any strain or racking action on the check-valves. The steam generated in the boilers, at an average pressure of 140lb. per square inch, was disposed of mainly by the engines attached to the electric generators, although a small portion of live steam was supplied for clothes-washing purposes to the public baths and washhouses adjoining the electricity works; exhaust steam was also supplied to the baths and free library, which were entirely heated from the steam raised by the refuse-destructor. The average cost of burning the refuse during the second year of working, including four furnace men, two top men and one charge man, supervision clerks, &c., cleaners and yard men, repairs, stores, and sundries, was 2s. 6·9d. per ton. The amount of electric energy absorbed in dealing with the refuse, including electric fans, lifts, trucks and lighting, was 4·98 Board of Trade units per ton per annum. A number of evaporative tests had been taken, with the result that with one boiler and two refuse-furnaces it was possible, by the burning of ordinary refuse, to evaporate 2,888lb. of water per hour, from and at 212° Fahr. The average calorific value of various tests was 0·99lb. of water per pound of refuse. The heating-surface of each boiler was 1,300sq.ft.; the refuse grate area was 25sq.ft., and the coal-grate area was 27sq.ft. The total amount of energy sold by meter to consumers was 1,031,348 Board of Trade units, including 131,140 units supplied to the refuse destructor. The total amount of refuse burnt was 26,201 tons, and of coal consumed 1,344 tons (value £1,308 14s. 8d.) The item of cost per ton for interest and redemption of land and plant—not usually considered in connection with refuse-destructors—was a matter for serious consideration, and in the case of the Shoreditch destructor plant—where land is very expensive—the charge worked out at practically 1s. per ton.

At Newtownards, County Down, a guildhall has just been added to the First Presbyterian Church at a cost of £1,600. Messrs. Young and Mackenzie, of Belfast, were the architects.

A meeting of master builders and employers in the building trades was held on Friday night at the Royal Hotel, Sutton Coldfield, at which a Master Builders' Association was formally inaugurated, and a code of rules for the working of the same was adopted. Mr. J. R. Jones was elected president, and Mr. W. T. Coleman secretary. The objects of the National Building Trades Employers' Federation were explained by Mr. A. E. Tallis (secretary of the Midland Centre), and it was unanimously resolved to affiliate the newly-formed association with the federation.

OBITUARY.

We regret to announce the death, in his 63rd year, of Mr. Stephen William Williams, F.S.A., F.R.I.B.A., F.S.I., of Rhyadyr, Radnorshire. Mr. Williams, who died on Monday last at Melville-street, Sandown, Isle of Wight, was well known for his excavations of and monographs upon several of the Welsh monastic ruins, including Valle Crucis and Cwmmer. He had an extensive practice, not only as an architect, but also as a land agent and surveyor. He had been a Fellow of the Surveyors' Institution since May, 1870, and of the Royal Institute of British Architects since 1886, and was formerly colonel of the Hereford Rifle Volunteers.

The death is announced, in his 70th year, of Mr. Eli Milnes, senior partner of the firm of Messrs. Milnes and France, architects, of Bradford. Mr. Milnes died at his residence, Park View, Harrogate, on Thursday in last week as a result of failure of the heart's action. He was the son of the late Mr. Henry Milnes, of Toller-lane, Manningham, an early member of the Bradford Corporation. He served his articles with the late Mr. Walker Rawstone, of Bradford, and when little more than twenty years of age he entered into partnership with the late Mr. John Dixon. On Mr. Dixon's death Mr. Milnes continued in practice by himself until 1863, when he took Mr. Charles France into the firm, and in 1888 his son, Mr. Charles E. Milnes, and Mr. A. A. France were also joined as partners. Having been in business in Bradford for nearly fifty years, Mr. Milnes has taken a large share in the entire remodelling of the town which has gone on during that time. His firm were among the earliest to undertake the erection of large warehouses in Bradford, and several notable commercial buildings, including the warehouse of Messrs. A. and S Henry, the Bradford District Bank, Beckett's Bank, and the Swan Arcade, were erected from their designs. For the last five years he had not given constant attention to the architectural work of the firm; but he had continued the active part which for years he played in the town as valuer and arbitrator in many large undertakings. He had acted for the Bradford Corporation in many street improvements, and had been largely interested in various local railway schemes, and Parliamentary work in connection with Bradford gas and water schemes. About five years ago Mr. Milnes gave up his residence in Bradford, and went first to Kent's Bank, Grange, and subsequently to Harrogate. While he resided in Bradford he was much associated with church work as warden of the parish church and of St. Philip's, Girlington. He was a director of the Third Equitable Building Society, Bradford, a Fellow of the Surveyors' Institute, and one of the original members of the Bradford Architects' and Surveyors' Society. He was also a life governor of the Royal Infirmary, Bradford. Mr. Milnes was married twice, and is survived by a widow and eleven children. The funeral took place on Tuesday at Scholemoor.

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The Norwich City Council have decided to rescind their resolution instructing a committee to prepare a scheme for the erection of new municipal buildings. The scheme would have involved an outlay of £100,000.

A Local Government Board inquiry was held at the town-hall, Tunbridge Wells, on Friday, relative to an application by the town council, to borrow £25,000 for electric-lighting extensions. There was no opposition, and the town clerk explained that £40,000 had already been borrowed. Mr. Boot, the electrical engineer, gave evidence in support of the scheme, and incidentally mentioned that the cost of production was now as low as 1·49d. per unit.

A great fire occurred on Saturday evening in New Wharf-road, Caledonian-road, King's Cross. It began on the premises of Messrs. Haggis and Sons, timber merchants, and extended to those of Messrs. Mowlem, the well-known contractors, and to a number of dwelling houses in an adjoining street. The damage done was very great. At Messrs. Haggis's, the saw-mills, a building of two floors 120ft. by 30ft., the boiler-house, and a quantity of timber were destroyed.

At the Central Criminal Court, on Tuesday, James Mayhoe, 43, builder, who pleaded "Guilty" at the last sessions to obtaining credit to the extent of £20 and upwards without informing the person from whom he obtained it that he was then an undischarged bankrupt, was brought up for judgment. The Common Sergeant bound the defendant over in his own recognisances in £50 to come up for judgement if called upon.

PROFESSIONAL AND TRADE SOCIETIES.

Eastbourne Master Builders' Association.—On Thursday, the 7th inst., an influential meeting of employers in the building and allied trades was held at Eastbourne, and attended by master brickmakers, carpenters, contractors, decorators, gas and hot-water fitters, masons and stone merchants, plumbers, &c., in addition to builders who undertake all branches. The meeting was convened by the Eastbourne Master Builders' Association, in connection with the South-Eastern Counties Master Builders' Federation, and invitations were sent to the principal employers in the district included between Brighton, Tunbridge Wells, and Hastings; but, owing to the pressure of trade, many letters of apology for absence were received. The chair was taken by Mr. Joseph Martin, president of the local association, and instructive speeches were delivered by Mr. T. F. Rider, president of the federation, and Mr. T. Gregory, president of the London association, and a discussion followed, taken part in by Mr. C. Patching, Brighton; Mr. H. E. Cruttenden, St. Leonard's; Messrs. Allum, Brock, and Stanbridge, Eastbourne; the chairman, and others. The suggestion that the formation of a County Association would materially help the combination of employers in the South was well received. On the proposition of Mr. Cornwell, seconded by Mr. Stanbridge, a cordial vote of thanks was accorded Messrs. Rider and Gregory, and a similar vote to the chairman concluded the meeting.

Glasgow and West of Scotland Technical College Architectural Craftsmen Society.—The annual meeting of the above society was held on Friday, Dec. 8, when a paper by Mr. D. Bennet Dobson was read on "Graphic Calculations." The lecturer divided his subject into eight sections—viz , Reactions, Moment of Resistance, Shearing Stress, Graphic Arithmetic, Wood Beams, Cast-Iron Beams, Rolled-Iron Beams, Steel Beams. Taking each of these sections in turn, he worked out examples on the blackboard in a very rapid and concise manner, giving the simplest methods of working out the examples and their variations. The president, in proposing a hearty vote of thanks to Mr. Dobson, spoke of the many entirely new methods he had shown, and trusted that the society would soon have the pleasure of seeing his present lecture and the one given last year on "Calculation Simplified" in book form.

Liverpool Architectural Society. — The council of this society have made a change in the character of the members' meetings this session, to be held alternately with the ordinary gatherings. The experiment is being tried in order to give the younger members of the society better opportunities for reading papers and joining in the discussions. A separate chairman has been appointed for each evening, who will sum up the discussion at the close. These evenings are open to all members of the society, and smoking will be permitted. The syllabus for the session is as follows:—Dec. 18, members' meeting, paper by Mr. G. W. Fraser, A.R.I.B.A., subject: "Windows and Their Treatment"; chairman, Mr. T. E. Eccles, A.R.I.B.A. Jan. 8, 1900, ordinary meeting, paper by Mr. Herbert Bryans, subject: "Stained Glass." Jan. 22, members' evening, paper by Mr. M. Honan, subject: "Doors and Doorways"; chairman, Mr. A. P. Fry. Feb. 5, ordinary meeting, paper by Mr. Arthur Stratton, A.R.I.B.A., subject: "Santiago de Compostella." Feb. 19, members' evening, paper on "Local Building Stones"; chairman, Mr. T. M. Reade, F.R.I.B.A., F.S.A. March 5, ordinary meeting, paper by Mr. A. Saxon Snell, F.R.I.B.A., subject: "Public Baths and Washhouses." March 19, members' evening, paper on "Roofs and Roofing"; chairman, Mr. P. C. Thicknesse. April 2nd, ordinary meeting, paper by Mr. E. P. Hinde, A.R.I.B.A., subject: "Notes on School Buildings." May 7, ordinary meeting, closing address by the president, Mr. E. A. Ould.

Midland Master Builders' Federation.—A meeting of the executive of the National Master Builders' Federation for the counties of Warwick, Worcester, Stafford, Derby, Leicester, Nottingham, Northampton, Lincoln, Huntingdon, Rutland, &c., was held on Tuesday at the office of the federation, Birmingham, under the chairmanship of County Alderman Bowen (Birmingham). The meeting discussed a resolution of the National Association of Master Plasterers, expressing the desire of the latter to become affiliated with the National Association of Master Builders. A resolution was passed to the effect that there was no objection to the Master Plasterers allying themselves with the Master Builders, but affiliation under the conditions stated by the plasterers could not be approved. The recent decision of Mr. Justice Bingham as to the finality of a builder's estimate was discussed, and, in view of the far-reaching importance of the question to the whole of the employers in the building trade throughout the kingdom, it was resolved that the National Association should be requested to draw up a standard form of estimate for general adoption. The annual meeting of the federation was fixed for January 16, at Birmingham.

St. Paul's Ecclesiological Society. — A meeting of this society was held at the Chapter House, St. Paul's, on Wednesday evening, when the following objects of ecclesiological interest were exhibited and described:—Wood-carving, by the Rev. L. Gilbertson; carvings in alabaster, &c., by the Rev. E. S. Dewick; the church plate of St. Martin, Ludgate, by the Rev. E. Hoskins; drawings of St. Paul's, &c., by Mr. Hanslip Fletcher; Paxes, &c., by Mr. A. Oliver.

Sheffield Society of Architects and Surveyors.—The ordinary monthly meeting of this society was held at the School of Art on Tuesday night. The president (Mr. Joseph Smith) was in the chair. The following gentlemen were elected associates:—Messrs. R. B. Brook Greaves, H. S. Hague, G. Osborn; and as student Mr. H. Appleby. Two gentlemen were nominated for membership, and will be balloted for at the next meeting. Professor T. Roger Smith, F.R.I.B.A., of London, delivered a lecture on "Oriental and Indian Architecture." He pointed out the differences between Western and Eastern architecture and art generally, resulting largely from difference in race, in climates, and in religion. The earliest monuments in India were topes or mounds for the preservation of sacred relics. These are Buddhist, and date back to before the Christian era. Round these are procession paths, inclosed by great posts and rails in stone, imitating timber, and profusely enriched. The carving from the Amravate tope, now in the British Museum, was elaborate and extensive. Buddhism was succeeded by the Jain religion and architecture, whose temples included high roofs and domes, and furnished suggestions for what followed. In all Indian architecture profuse ornament and constant repetition were invariable. The high pyramidal roof was constantly met with, also the pier and bracket. Another feature of constant occurrence was slabs of stone perforated in patterns to fill windows with. Most of the great temples stood in an extensive inclosure, with gateways, with high roofs. Next came the true Hindu temples, which differed in the North and South of India; the high roofs in the North were straight sided and profusely ornamented, while in the South lofty gourd-shaped domes were employed, differently ornamented. The Saracenic or Mohammedan architecture, which was the next type, introduced by Mogul invaders in the 11th century, had its origin in Arabia, Egypt, and Syria. The lecturer described the nature of a mosque, pointed out the early introductions of the pointed-arch Mohammedan buildings in Delhi, Ahmedabad, and Agra, and went on to describe in detail the Taj at Agra. The lecture was illustrated by lantern photographs of temples in various parts of India, and of the Buddhist tope at Sauchi and Saracenic buildings in Cairo and in India. A hearty vote of thanks was accorded to the lecturer on the motion of Mr. E. M. Gibbs, seconded by Mr. J. R. Wigfull, and supported by the President and Mr. H. L. Paterson.

Society of Engineers. — The forty-sixth annual general meeting of the Society of Engineers was held on December 11, at the rooms of the society, 17, Victoria-street, Westminster. The chair was occupied by Mr. John Corry Fell, President. The following gentlemen were duly elected by ballot, as the council and officers for 1900, viz.:—As President, Mr. Henry O'Connor; as vice-presidents, Messrs. Charles Mason, Percy Griffith, and James Patten Barber; as ordinary members of council, Messrs. Joseph Bernays, D. B. Butler, G. A. Pryce Cuxson, W. H. Holttum, R. St. George Moore, Nicholas J. West, Joseph William Wilson, and Maurice Wilson; as hon. sec. and treasurer, Mr. George Burt; as hon. auditor, Mr. Samuel Wood, F.C.A. During the scrutiny the President addressed the meeting, bringing before the members the salient points of the work of the past year. He also announced that the following premiums had been awarded by the council for papers read during the past session, viz. :—The President's Gold Medal to Mr. E. Wynter Wagstaff for his paper on "The Shan Hill Country and the Mandalay Railway"; the Bessemer Premium to Mr. R. G. Allanson-Winn for his paper on "Foreshore Protection, with special reference to the Case System of Groyning"; a society's premium to Mr. Gordon Harris for his paper on "Water Supply to Country Mansion and Estates"; and a society's premium to Mr. Ewart C. Amos for his paper on "Machine Tools." The annual dinner of the Society took place on Wednesday evening, at the Hotel Cecil, the President, Mr. J. Corry Fell, in the chair. The toast of the evening was proposed by Mr. Fletcher Hamilton, Q.C., M.P., acknowledged by the President.

CHIPS.

At Halifax, on Friday, Mr. W. O. E. Meade-King, representing the Local Government Board, held an inquiry respecting an application by the town council for sanction to borrow £58,899 for the purpose of street improvements and the formation of new roads.

The annual dinner of the Devon and Cornwall branch of the National Registration of Plumbers was held at the Masonic Hall, Princess-square, Plymouth, on Saturday evening. The president, the Mayor, Alderman J. Pethick, presided, and a numerous company included Alderman C. H. Radford (chairman of the Plymouth Electric Lighting Committee), Mr. Francis (water engineer, Devonport), Messrs. J. B. Brown, T. W. Byfield, C. Moon, J. Neal, P. B. Shires, F.R.I.B.A., J. Harvey, M.S.A., F. T. Rowe, and E. Lee (Torquay).

Colonel W. Langton Coke, M.Inst.C.E., held an inquiry at Truro on Thursday in last week on behalf of the Local Government Board, in consequence of a complaint by Cornwall County Council that the Corporation of Truro had made default in providing the city with sufficient sewers, or in maintenance of existing sewers. The witnesses for the county council included Mr. Silvanus Trevail, F.R.I.B.A., V.P.S.A., a member of the Truro Corporation and a former mayor, and for the corporation the present mayor and ex-mayor of the city.

Workington Town Council have resolved to promote a Docks Bill in next session of Parliament, instead of leaving the scheme in the hands of a syndicate.

A meeting of the works committee of the Edinburgh and District Water Trust was held on Monday to consider the six tenders for the completion of the works at the Talla reservoir, which had been remitted to the engineer for report. After consideration, it was agreed that some further detailed information with regard to the various estimates should be obtained before a decision was arrived at.

At the meeting, on Tuesday, of the London County Council it was agreed, on the recommendation of the Parks Committee, that the Tudor dwelling at Bromley Recreation Ground, known as Rutty's House, be cleared away, and the site laid out as part of the recreation ground.

At Garston, on Monday, Mr. Brighouse, county coroner, held an inquest respecting the death of Mr. George Henry Gibson, C.E., contractor and erector, 43, Island-road, Garston, who died suddenly on the previous Thursday evening. The medical evidence showed that death was due to heart failure, and the jury returned a verdict in accordance therewith.

The name of Mr. James Wilson, builder, 25, Riego-street, Edinburgh, has been added to the commission of the peace for the city of Edinburgh.

At the Plymouth Prison, on Monday, Mr. Johns, borough coroner, held an inquiry concerning the demise of Richard Pawley, 40, builder, Devonport, who was found dead in his cell on Saturday morning. Mr. A. E. S. Akaster, solicitor, of Devonport, represented the relatives of the deceased. The evidence showed that deceased, who was serving a term of three months' imprisonment with hard labour for assault, was found suspended from the bed-board with a towel tied round his neck. A verdict of suicide whilst temporarily insane was returned.

The Stockport Rural District Council have received the sanction of the Local Government Board to their application to borrow £17,235 for the completion of the Bramhall sewage scheme.

Sir Archibald Geikie, Director-General of the Geological Survey of Great Britain and Ireland, will retire from office in the course of next year under the age-limit rule of the Civil Service.

LEGAL INTELLIGENCE.

The Value of Premises in the Strand.—Mr. Troutbeck and a special jury heard, on Tuesday, the case of "Hesse v. the London County Council," a claim for compensation in respect of the freehold interest in the premises 294, Strand, and 34 and 34A, Holywell-street, which will shortly be demolished in order to widen the Strand between St. Clement Dane's and St. Mary-le-Strand. Mr. Freeman, Q.C., and Mr. Eldon Bankes appeared for the claimant; Mr. Edward Boyle, Q.C., represented the London County Council. The premises in the Strand were let to the Aërated Bread Co., Ltd., at £150 a year, and those in Holywell-street to Mr. Gilbert Noble, bookseller, for £150 a year. Alderman Samuel Green (Messrs. Green and Sons) stated that there was a term of eight years unexpired from June, 1898, at this rent, and, capitalising it at 6¾ years' purchase, his figure for the present value of the premises was £2,025. The premises would have to be rebuilt at the expiration of the leases, and would then command a ground-rent of £301 per annum, which he capitalised on the 3½ per cent. tables (21·7 years' purchase), £6,532. With the addition of the customary 10 per cent. for compulsory sale, his total valuation amounted to £9,412. Alderman Sir John Whittaker Ellis (Farebrother, Ellis, and Co.), Mr. Edward Holroyd Bousfield (Fox and Bousfield), and Mr. F. Green (Green and Sons) also gave expert evidence in support of the claim. On behalf of the London County Council, Mr. Edward Boyle called Mr. G. A. Wilkinson, Mr. James Green (Weatherall and Green), and Mr. Howard Martin (Thurgood and Martin), whose valuations ranged from £5,933 to £5,974, including the usual allowance of 10 per cent. for compulsory sale. It was stated that the premises were in the last stage of decay, and that the Holywell-street portion was built more than 300 years ago. After viewing the property, the jury assessed the compensation at £6,500, inclusive of the customary allowance for compulsory sale.

Priced Estimates at the New Municipal Buildings at Llandudno.—Warburton v. the Llandudno Urban District Council. — Mr. Justice Cozens-Hardy, in the Chancery Division of the High Court of Justice, heard on Wednesday and Thursday and Friday in last week, an action brought by Mr. Samuel Warburton, a builder, against the Llandudno Urban District Council for damages for having ejected him from the site of the new municipal buildings at Llandudno, which he had contracted to build, and for a loss of profit estimated at 15 per cent., £2,081. Mr. Astbury, Q.C., in opening the case, said the plaintiff was a builder, who had been in the habit of putting up large buildings in many towns, and the corporation of Llandudno, being minded to erect municipal buildings, advertised for tenders. The plaintiff tendered for £13,800, and that tender was accepted. Before the plaintiff tendered he was furnished with a list of quantities, and there was a term in the contract that all additions and alterations when they came to be paid for should be made out according to the original estimates of the builder, and it was therefore necessary that the builder should keep his original quantity prices, but they were only to be kept for the purpose of pricing at the end of the contract. One of the conditions of the contract was that the contractor was to furnish the architects at the time of signing with a verified sealed copy of the original estimate. Plaintiff contended that it was not usual with builders in Liverpool or other large towns in the North of England to furnish a copy of the original estimate to the architect of the building. Plaintiff was put into possession of the site, he had spent money and time on the building, and then the defendants refused to let him go on with the work unless he allowed them to look at the sealed copy. The copy was not to be used until the additions were to be priced, so that the architects should not be able to choose additions which would be unjust to the builder. The plaintiff offered to allow the town clerk of Llandudno to verify the original estimate; but he would not do so, and the plaintiff thereupon refused to allow the surveyor to verify it, because it would be permitting it to be done by the person against whom it was to be sealed. The plaintiff was to be put into possession Jan. 1, 1899, and the work was to be concluded on June 30, 1900. The plaintiff undertook to find sureties for £2,000 for carrying out the contract, and to furnish the architects with a verified sealed copy of the original estimate. Work was commenced on Feb. 13, and the sureties were deposited, and a sealed copy of the estimate verified by Mr. Lees, chartered accountant, was sent to the architects. On March 2 plaintiff received a notice that unless he furnished a duly verified sealed copy of the original estimate the contract would be rescinded, and the defendants would proceed against the plaintiff for damages. The defendants contended that the architects or their surveyors were the proper persons to verify the sealed copy. Defendants ejected the plaintiff from the site on March 13, and took possession of the building material and other property of the plaintiff, and had since continued in possession. The plaintiff claimed for £2,081 2s. for loss of profit on the contract work, estimated at 15 per cent.; £78 19s. for building material, &c., appropriated and converted by the defendants for their own use; and £500 for special damages. Mr. Eve, Q.C., for defendants, asked if those were moral and intellectual damages. Mr. Astbury said it was for damage to the plaintiff's reputation in having been turned out of his job. The defence was that the defendants did not admit that the agreement was intended to be final or binding unless the plaintiff should furnish the architects with a sealed copy of the original estimate, duly verified, which they said was not done, and that the contract was rescinded. Further, they alleged that the plaintiff had revoked the contract, and that, independent of the default of the plaintiff in reference to the sealed copy, he had, after the execution of the contract, expressed his intention of disregarding other terms of the contract, and of not carrying out the works in accordance with the drawings and specifications. The defendants accepted the plaintiff's tender because it was the lowest, on the condition that he would not make any claim in respect of what he had done for them in the past. It was obvious that the defendants, from the correspondence which had passed, desired to get rid of Mr. Warburton. Mr. Eve admitted that, because the plaintiff had given so much trouble. His Lordship thought that the Llandudno Corporation were very moderate in their correspondence. The plaintiff stated that he had been a master builder for nearly 40 years, and had constructed works for the War Office, the Post Office, and various railways and corporations in the North of England. He tendered for this work in October, 1898, and he obtained a bill of quantities from the defendants' surveyors. He received in due time a notice that his tender had been accepted, and at the end of November he received from the town clerk a copy of the contract. He insisted on the word "sealed" being inserted in the paragraph relating to the furnishing of a copy of the original estimate to the architects. The original estimate was not required by the person employing a builder until the squaring-up for alterations and additions, and there was no object for which the architect or surveyor could desire to see the estimate until the contract was completed. It was unfair that the architect or surveyor should see the original estimate before deciding on what additions there should be. The copy which was furnished the defendants was verified by Messrs. Lees, chartered accountants, and he was of opinion that that was a sufficient verification under the terms of the contract. The architects did not tell him that he was not to commence the work until the copy was furnished to them; but they pressed him to go on with the building. He put upon the site materials which cost him £78. He offered to allow Mr. Conolly, the town clerk, or Mr. Lockwood, of Chester, to verify the copy. In other contracts he had entered into he had never been asked to verify the copy. While he was on the property he was ready and willing to go on with the contract properly and reasonably, and he had never refused to carry out any term he was bound to carry out. In cross-examination, the witness said he objected to any quantity surveyor who had an interest in the building or power of making alterations, seeing his prices and so be able to pick out the plums and leave the stones. Mr. John Holden, architect and surveyor, Manchester, said that in his experience there was nothing that the copy of the estimates could be required for except the purpose of adding up the extras at the end of the contract. He thought £500 was a small amount to put down as damages, and though 15 per cent of profit might be a reasonable sum, he could not say whether the plaintiff would have made so much. For the defence, Mr. Eve, Q C., submitted that by the contract there was to be a verified copy of the original estimate for the sole use of the architect and surveyor appointed. The object of that was that it should be deposited in such a manner that it should not be available for anyone but the architect and surveyor. Mr. Justice Cozens-Hardy asked what ground the defendants had for imparting into the contract that the copy was to be verified by the architect or quantity surveyor. Mr. Eve said that that would be done for the protection of the employer, whose architect was entitled to look at the estimate, and if the plaintiff came to the court for damages and said he handed the copy to the defendants on the promise that it should not be looked at, that disentitled him to damages. Further, he submitted there never was any verification within the meaning of the clause in the contract, and that verification should be done, not by an accountant, but by the contracting parties. Mr. Alfred Conolly, town clerk of Llandudno, and Mr. Thomas Silcock, the architect of the building, were called for the defendants, the latter stating that owing to the great rise in building materials it was very doubtful whether the plaintiff would have made a profit if he had completed the building. Mr. Justice Cozens-Hardy, in giving judgment, said this was a very peculiar action. The plaintiff was a builder, by common consent, of high repute. The Llandudno Council took up a position which at a very early stage he had been entirely unable to appreciate. They said that clause 3 of the contract meant that the plaintiff must not only furnish a verified or certified copy of his original estimate which was sealed, but that he must furnish a copy which was verified by one individual, and one individual only—namely, the quantity surveyor who had prepared the bill of quantities. He entirely failed to see any justification for such a contention. All he had to decide was whether the Llandudno Council was right in refusing to allow the plaintiff to go on with the work and making a fresh contract on the ground that he had failed to furnish the architect with a verified sealed copy of the original estimate as provided in the contract. He thought the council were wholly in the wrong, and that the plaintiff absolutely and entirely complied with every obligation under clause 3 when he sent the sealed copy of the original estimate verified by Mr. Lees, the accountant. He therefore must make the declaration that the plaintiff asked, and that on the true construction of the agreement the defendants were not entitled to have the sealed copy verified by the defendants' architect or quantity surveyor. That being so, it followed that the defendants had been guilty of a breach of their contract with the plaintiff. He did not find a trace of any intention by the plaintiff to insist on breaking any terms of the contract. On all these grounds he thought the defendants could not be justified in what they did, and he thought the plaintiff was entitled to damages. Damages were claimed under three heads. First of all the plaintiff claimed loss of profit on the contract work of 15 per cent., which worked out at upwards of £2,000. On the whole, having regard to the evidence, he thought it would be right to order the defendants to pay £1,000 for damages for breach of the contract. Then the plaintiff claimed £78 for building materials which had been left by him on the site, and had been sold by auction on the order of the defendants, who had tendered the amount they realised to the plaintiff. As the plaintiff had been requested to remove these materials and had failed to do so, he was not disposed to give damages beyond what the defendants had offered—namely, the sum realised at the auction sale. The third claim of the plaintiff was for £500 on the ground of damage to his reputation in consequence of the fact of his having lost the contract being referred to in certain trade and local papers. He was bound to say he could not see any justification for this claim, especially as it was not a case in which there was any allegation of misconduct on the part of the plaintiff. The only damages would be the £1,000 he had mentioned, and there would be an order for the defendants to pay the £13 5s. which they had undertaken to pay for the materials sold by auction. The defendants must pay the costs of the action, and the counterclaim must be dismissed, with costs.

In re G. T. Chappell, of Leek.—At the Macclesfield Bankruptcy-court, on Thursday in last week, the public examination of George H. Chappell, surveyor, Overham-bank, Leek, took place before the registrar, Mr. H. C. Yates. The debtor's statement of affairs showed gross liabilities amounting to £50,290 15s. 2d., of which £50,280 15s. 2d. was expected to rank, whilst the assets were stated to be nil. The debtor alleged as the causes of his failure being guarantor for his father in 1893 to the extent of over £43,000, money-lender's interest, and pressure by the petitioning creditor. About five years ago the debtor opened an office in Norfolk-street, London, where he carried on business as a surveyor for about twelve months. At the end of that period he had to give it up owing to insufficient capital. For the last four years he had made between £4 and £5 per week. At the date of the receiving order the debtor was living at 4, Ashbourn-road, Leek, which was taken in his wife's name. The furniture was claimed under an antenuptial settlement. At the date of the receiving order there were three unsatisfied judgments against the debtor, amounting altogether to about £43,255 Amongst the unsecured liabilities were the following:—Under a guarantee, dated 1893, for his father, who failed in that year, £43,100; under a covenant in his marriage settlement, £5,000; in connection with Stock Exchange transactions, £1,284 19s. 9d.; and for money borrowed, £608 3s. 7d. The debtor said he formerly acted as manager for his father, who, up to 1893, was the second largest builder and contractor in London. He paid him about £7 a week in wages, and he (the debtor) also received a share of the profits. At the time of his father's failure, he (the debtor) probably had £200 or £300 of his own, but it went along with the business. He saw no prospect of being able to discharge the whole of his debts.

Mather v. W. G. Sutherland, Limited.—At Manchester, on Friday, the Vice-Chancellor made an order for the appointment of a receiver and manager in this debenture holder's action, upon the application of Dr. Atkinson. The company, which carries on business in Oxford-street, Manchester, was represented by Mr. Raby, who admitted that it was insolvent and consented to the application.

In re H. L. Pridmore, of Ilford. — At the Chelmsford Bankruptcy-court, on Wednesday week, Harry Letts Pridmore, builder and contractor, of 67, Belgrave-road, and Ilford Hill, Ilford, appeared for his first public examination. Mr. G. Watkins represented the debtor, who returned his liabilities at £2,551 16s. 6d., and his net assets at £1,236 3s. 6d He started business fourteen months ago, and the whole of his deficiency had arisen during that time. He commenced with a capital of £450, consisting of equities, properties at Halstead, and household furniture, but he had no cash. In answer to the Official Receiver, debtor admitted that he received £200 by a bill of sale and only entered £140 in his cashbook. He wanted the balance for other purposes. When the receiving order was filed he ceased building 82 houses under contract at Ilford. He had made a net loss of £812 17s. from Aug. 5th, 1898, up to the date of the receiving order. He expected to make a profit of £1,000 from the sale of some property at Illford Hill to the Post Office, but the matter did not go through. He was to have built a town-hall at Ilford, but his sureties refused to execute the bond. He did not consider that £580 for living was an extravagant sum for fourteen months. The examination was adjourned until January 3.

Railway Arbitration from Radcliffe.—At the Surveyors' Institute, Great George-street, Westminster, on Friday, Mr. W. H. Elwell, F.S.I. (surveyor to the War Office), sat as sole arbitrator in proceedings to determine the price to be paid by the Lancashire and Yorkshire Railway Company to the Earl of Wilton in respect of the acquisition by them of two strips of land, each about 40ft. wide, in the township of Radcliffe, near Manchester, which forms part of his lordship's estate, and is required by the company to strengthen and widen the banks of the Bury and Bolton Canals, of which they are the owners. The land involved has a total area of about 1¾ acres. The witnesses for the claimant estimated its value at £4,172, and the valuers of the railway company put the sum at £467. The arbitrator reserved his award.

A Dumbartonshire Reservoir Arbitration.—Mr. John J. Coats, solicitor, Glasgow, has issued the notes of the proposed findings in an arbitration between Lord Blantyre and the Eastern District Committee of the Dumbarton County Council, the latter having obtained compulsory powers to acquire a portion of land from Lord Blantyre and the neighbouring proprietor, Mr. Hamilton, of Cochno, for the purpose of making a reservoir. Lord Blantyre's claim was for £10,000. Mr. Coats, after discussing at length the legal difficulties in the way of the proposal, says that he is of opinion that £60 per acre, which includes any allowance for compulsory purchase, full compensation to Lord Blantyre, and that is the figure he proposes to adopt. The extent of land taken was 27 6 acres, and that at £65 per acre made £1,656.

Value of Building Land at Streatham.—As the result of recent arbitration proceedings, Mr. Robert Vigers, past president of the Surveyors' Institution, has awarded the Artisans and General Dwellings Company, Ltd., of which Sir Richard Farrant is chairman, £5,461 compensation in respect of the acquistion of 65 plots of freehold building land, forming a portion of the Leigham-court Estate, Streatham, by the London School Board. The claim was for £9,620, expert witnesses examined on behalf of the company having valued each of the plots possessing a frontage of 15ft., at £6, £390—25 years' purchase.

In re T. Marsden, Blackburn.—At the Preston Bankruptcy-court, on the 8th inst., before Mr. Dickson, Registrar, Thomas Marsden, builder's merchant, Manchester, lately carrying on business at 20, Moore-street, South Shore, came up for his public examination. The debtor's statement showed that the gross liabilities were £39,630; expected to rank for dividend, £7,664; assets estimated to produce £569; deficiency, £7,074. The debtor alleges as to the cause of his failure, "Fall in the values of land and buildings." Mr. Morris (Deputy Official Receiver) went through a list of creditors, and the debtor stated that he had informed them that he was an undischarged bankrupt. He contracted the majority of his debts since November, 1898. He went into speculations of several thousand pounds, but only had a small capital. Debtor was questioned by several creditors as to when and where he told them he was an undischarged bankrupt. He maintained he had told them all, but this was denied. The examination was adjourned for a fortnight, for the debtor to furnish a deficiency account and detailed statement of the amount for which he mortgaged the respective properties.

The Authority of a Clerk of Works.—Mr. George Saunders, 37, Park-avenue, Edmonton, sued the Great Eastern Land and Building Company, Ltd., 2, Church-court, Clement's-lane, in the City of London Court last week for £10 9s. 4d. for stone supplied. Mr. Glasgow, plaintiff's counsel, stated that he was a dealer in builders' materials, and the defendants were a company formed for the purpose of erecting streets of houses at Edmonton. The order for the goods sued for was given by Mr. Laite, the clerk of the works employed by the defendants. The defendants were now raising the point that the clerk of the works had no authority to order the goods, although the defendants had paid for previous goods ordered by him. The plaintiff was called, and said it was not true that he knew Laite only had authority to give orders for less than £5 without getting them ratified by the company. He denied that the stone sued for was of bad quality. Mr. Brandon, defendants' counsel, said his defence was that on all defendants' order forms it was clearly stated that no orders above the value of £5 would be recognised unless they had the ratification of the company. Laite was well aware of the limitation of his authority. The principals could not be bound where a clerk of the works went out of his way to give orders which he had no authority to give. Judgment was given for the plaintiff for the sum claimed, as well as on the counterclaim which had been raised, and leave to appeal was refused.

Dispute as to a Brickmaking Machine.—At the West Riding Assizes held at Leeds, Mr. Justice Grantham heard on Saturday, Monday, and Tuesday an action in which Messrs. William Johnson and Sons, makers of brickmaking machinery, Castleton Foundry, Armley, Leeds, sued the New Malden (Surrey) Potteries and Brick Works, Limited, for £413 16s. 9d. for a brickmaking machine. The defendants contended that the machine did not turn out 4,000 bricks per hour as specified, and they made a counterclaim for damages for non-performance of contract. For the plaintiffs evidence was given to the effect that the clay used was too hard and dry, and that if the machine had been properly worked it would have turned out 4,000 bricks per hour. This was denied by the defendants, and expert witnesses were called, who stated that the clay was good average plastic clay, and that the machine, with a 19in. pug mill, would only make from 15,000 to 20,000 bricks in a working day of ten hours. His Lordship reserved judgment.

A Workmen's Compensation Act Anomaly.—At Birmingham County-court, on Wednesday, before his Honour Judge Whitehorn, an application was made under the Workmen's Compensation Act. In May last a labourer named Edwards was awarded 10s. per week compensation in respect of an injury received while in the employment of Mr. Perrell, builder and contractor. The application now was to terminate the payments, inasmuch as Mr. Perrell had offered Edwards £1 per week as a painter's labourer. The situation, however, was refused. The medical evidence showed that the man was capable of doing such light work as he was offered; but Edwards said he had been a master baker, had only entered the applicant's employment temporarily, and did not want to be a labourer again. He was now selling patent wicks for lamps and making a profit of about 8s. per week. His Honour decided that the present pay should not be continued.

The Drainage of Charlton. — Before Lords Justices A. L. Smith, Collins, and Vaughan Williams, an appeal was heard on Wednesday of the London County Council from a decision of a divisional court, making absolute a rule for a *mandamus* directing them to provide effectual drainage for the parish of Charlton in the district of Lee. Their lordships dismissed the appeal, holding that an absolute obligation was imposed on the County Council to provide proper drainage for the parish, but that they had made no attempt to do so. It was stated that the County Council had now adopted a large scheme which would provide for the needs of the district, and the *mandamus* was ordered to lie in the office for 12 months.

Beaman and Deas, Limited.—A meeting of creditors of the above company is being held to-day at the Westminster Palace Hotel, at 2.45 p.m. prompt, which it seems desirable should be fully attended. As chairman of the last meeting of creditors, Mr. John Forster, of St. Helen's, Lancashire, writes that he asked the solicitors of the company to call this meeting; but they decline to do so, or to attend to-day to state the exact position of the company. They object on the ground of expense, but have informed Mr. Forster that they have made a conditional contract for sale for an amount that will (1) pay interest due to debenture holders, (2) pay debenture holders in full—one half in cash, and one half in preference shares in the buyers' company, (3) pay costs to receiver appointed by the Court on behalf of the debenture holders. It will be observed that there is no provision made for creditors, whose only option, they say, is to make them some better offer.

Colonel Yorke, Board of Trade inspector, visited St. Helens on Friday and inspected the Peasley Cross section of the St. Helens tramways prior to its opening on the electric system. Colonel Yorke afterwards visited the tram depot and the electricity generating station, and also went over the Prescot section in order to decide on the speed for the various gradients. The electric cars commenced running on the Peasley Cross section on Monday.

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ILLUSTRATIONS.

GENERAL ACCIDENT ASSURANCE OFFICES, PERTH.—NEW CHAPEL AND SCHOOLS, BATH.—THE "GENERAL DRAPER" PUBLIC HOUSE, BRISTOL.—DESIGNS FOR PAINTED GLASS, MDXXXIX. TO MDLXXXIV. — NEW BRANCH LIBRARY, ROATH, CARDIFF.—HOLY TRINITY CHURCH, SHIREBROOK.

Our Illustrations.

THE GENERAL ACCIDENT ASSURANCE CORPORATION OFFICES, PERTH, N.B.

This building is at present in course of erection on the site of the old post-office at the corner of High-street and Tay-street. The principal elevations are being built of yellow freestone from Woodburn Quarry, Cumberland, with polished Aberdeen Corrinnie granite doorways, and red stone columns in the colonnade of the second floor. Internally the walls of the principal office will be lined with marble and finished in wainscot. The staircase will also be of marble and wainscot, while the general manager's room and the board-rooms will be panelled in fumigated mahogany. There is a basement floor extending under the whole area of the building, in which are situated the strong-rooms, store-rooms, boiler-rooms, and dynamo and storage battery for electric lighting. The level of this floor is under the flood-level of the River Tay, and it has therefore been specially constructed to be watertight, to withstand the very heavy floods which are so frequent in this river. The principal department on the ground floor will have desk accommodation for about 80 clerks, with public space and counter; and the department on the second floor accommodation for about 40 clerks. The architect is Mr. George P. K. Young, A.R.I.B.A., of Perth. The drawing which we give was exhibited at the Royal Scottish Academy this year at Edinburgh.

MOORFIELDS CHAPEL AND SCHOOL.

The chapel and school building shown is about to be erected on the Moorfields Estate, Bath. The scheme consists of a chapel, accommodating 360, together with minister's and deacons' vestries, and a school building adjoining, consisting of a schoolroom, 56ft. 6in. by 30ft., accommodating 340 children. It is proposed to erect the building with Bath stone walling, with wooden casements and frames, and tiled roofs, the turret to be covered with oak shingles. Messrs. Silcock and Reay, of Bath, are the architects.

THE "GENERAL DRAPER," HOTWELLS, BRISTOL.

This house has lately been rebuilt for the owners, The Anglo Bavarian Brewery Co., Ltd. The materials of which the buildings are composed are red-facing bricks, with Bath stone dressings, and Bridgwater Broseley tiles; the whole of the fittings to the bar being in pitch pine. The architects for the buildings were Messrs. Walter S. Paul and James, A.R.I.B.A., of Cardwell Chambers, Bristol. The contract was carried out by Mr. J. Perkins, of Redland, Bristol.

ORIGINAL DRAWINGS FOR PAINTED GLASS SWISS WORK, MDXXXIX-MDLXXXIV.

These spirited drawings, one of which bears the date of 1539, and the other 1584, have been lent us by Sir Charles Robinson, from his famous collection of historic drawings and designs. Their style is eminently characteristic of Swiss work of the period, full of fancy, and rich in decorative detail; very free, no doubt, in its suggestions of architectural detail, and distinguished by a florid treatment of line, which somehow or other looks uncommonly well in glass suitably set. The style may be open to many trite objections; but at least it is decorative, and the figures, whatever else they may lack, are full of go and dash. They are not mawkishly mediæval, neither do they pose in lifeless æstheticism, smug in the quiddles and quips of arts and craftitude. These drawings are manly and quaint; they are old too, and anyway, therefore, are historically interesting.

ROATH BRANCH LIBRARY, CARDIFF.

This building is proposed to be erected at the junction of Newport-road and Four Elms-lane, Cardiff. The design illustrated herewith was placed first in competition by the assessor, Mr. H. V. Lanchester, and has been accepted by the library committee for execution. The exterior will be faced with pressed red bricks, and the interior with pressed buff bricks with glazed brick dadoes. The dressings will be of Corsham Down stone. The roofs will be covered with green slates. There will be terazzo paving to the lavatories, porches, &c., and wood-block floors elsewhere. The interior joinery will be of pitch-pine stained and varnished. Natural ventilation is intended, and the heating will be by means of low-pressure hot water with ventilating radiators. The building will be lighted by electricity. The accepted tender is £2,468. The architects are Messrs. Teather and Wilson, Cardiff.

HOLY TRINITY CHURCH, SHIREBROOK.

It was intended by the previous vicar of Shirebrook to add to the existing church a north and south aisle, and to enlarge the chancel, which would have added 160 more sittings; but upon the present vicar, the Rev. Edward Braddon, being appointed to the benefice in the early part of this year, the original scheme was abandoned, and a more adequate scheme prepared for a new church to be built on the north side of the existing one, utilising the present church as the south aisle of the proposed church. The accommodation provided, including the present church, which seats 150, will be a total of 568, allowing 20in. each person. The plan accompanying the view explains the general arrangement. The wall stone is the gift of the contractor for the G.N. Leen Valley extension to Langwith Junction, Mr. W. H. Hutchinson, but all the labour and cartage has to be added. It is proposed to face the inside walls and all jambs and arches to windows and the arcade arches in Ancaster stone; window-sills and copings, and buttress weatherings to be in white Mansfield stone. The floor will be in pitch-pine wood blocks. Tenders have been obtained for the first section—the nave and north aisle. The cost is about £2,000; the complete building will cost £4,000. The architect is Mr. Hedley J. Price, A.R.I.B.A., of Low Pavement, Nottingham.

* * *

Work has been commenced on the construction of the Truro and Newquay Railway. The contractor is Mr. A. Carkeek.

The Shoreditch Technical Institute, which is conducted by the London Technical Education Board, in the buildings formerly occupied by the Aske's Schools, Hoxton, has opened with over 300 students. The trade classes formerly carried on at the Shoreditch Municipal Technical School and Finsbury Technical College have been transferred to the new institute, and a domestic economy school has been established, to which 30 scholars have been appointed by the board. The buildings have undergone thorough renovation, and have been adapted to the purposes of a technical institute. Additional workshops are being erected.

The scheme of the Ripon Corporation for the extension of the city boundaries, as embodied in their application to the Local Government Board for a Provisional Order, has now been issued. The area proposed to be incorporated is larger than that at first suggested, and includes the whole of the townships of Bishopton and Sharow, and part of Littlethorpe. The addition to Ripon would be an area of 1,212 acres, ratable value £7,366, and estimated population 958. This would give the proposed extended city an area of 2,792 acres, ratable value £40,603, and population 9,458. The whole of the new area can be drained naturally to the Ripon Sewage Farm.

BOOKS RECEIVED.

Who's Who for 1899 (London: A. and C. Black, Soho-square), is as up-to-date and attractive as ever. No one who has to make himself acquainted with the history and antecedents of people with whom he comes into public or business relations (and what architect hasn't?) should be without it.——*The City Diary* for 1900, published at the offices of the *City Press*, has in previous years presented a week's days at view; but this year only three days appear on each page, and consequently much greater space than before is available for the noting of business memoranda.

CHIPS.

The appointment of Mr. Arthur Cates, F.R.I.B.A., as a member of the Tribunal of Appeal expiring by effluxion of time on December 31, the London County Council have reappointed Mr. Cates a member of that Tribunal for the term of five years commencing January 1, 1900, under sections 175 and 176 of the London Building Act, 1894.

The Town Cross at North Walsham has just been restored by Messrs. Cornish and Gaymer, of that town.

A strong protest will be made against the proposal to pull down St. Ethelburga's, Bishopsgate, both on archæological and utilitarian grounds. It is an ancient Early Perpendicular building, and presents a good idea of what a Mediæval City church was on a small scale. The present east window, which is an excellent study of old models, was one of Kemp's earliest work.

An interesting MS. has lately been given to the Lichfield Cathedral library by the Rev. T. Barns, vicar of Hilderstone. It contains the treatise "On Contemplation," which was written by St. Bernard, Abbot of Clairvaulx, and sent in parts to his friend and former pupil, Pope Eugenius III. (1145—1153). The MS. has twenty-seven leaves, vellum, 9in. by 6⅝in., and is written in an English hand of the 14th century. The MS. comes from the Ashburnham library.

At Peterborough a new Liberal Club is in course of erection in Lincoln-road. The frontage will be occupied by seven shops, and over these will be a reception-room, reading-room, billiard-room, smoke-room, committee rooms, ladies' room, kitchen, caretaker's residence, &c. The premises will be so arranged that by the removal of a partition a large room may be obtained suitable for public meetings, &c. Mr. A. W. Ruddle is the architect, and Mr. D. Gray, also of Peterborough, the builder. The cost is about £4,000.

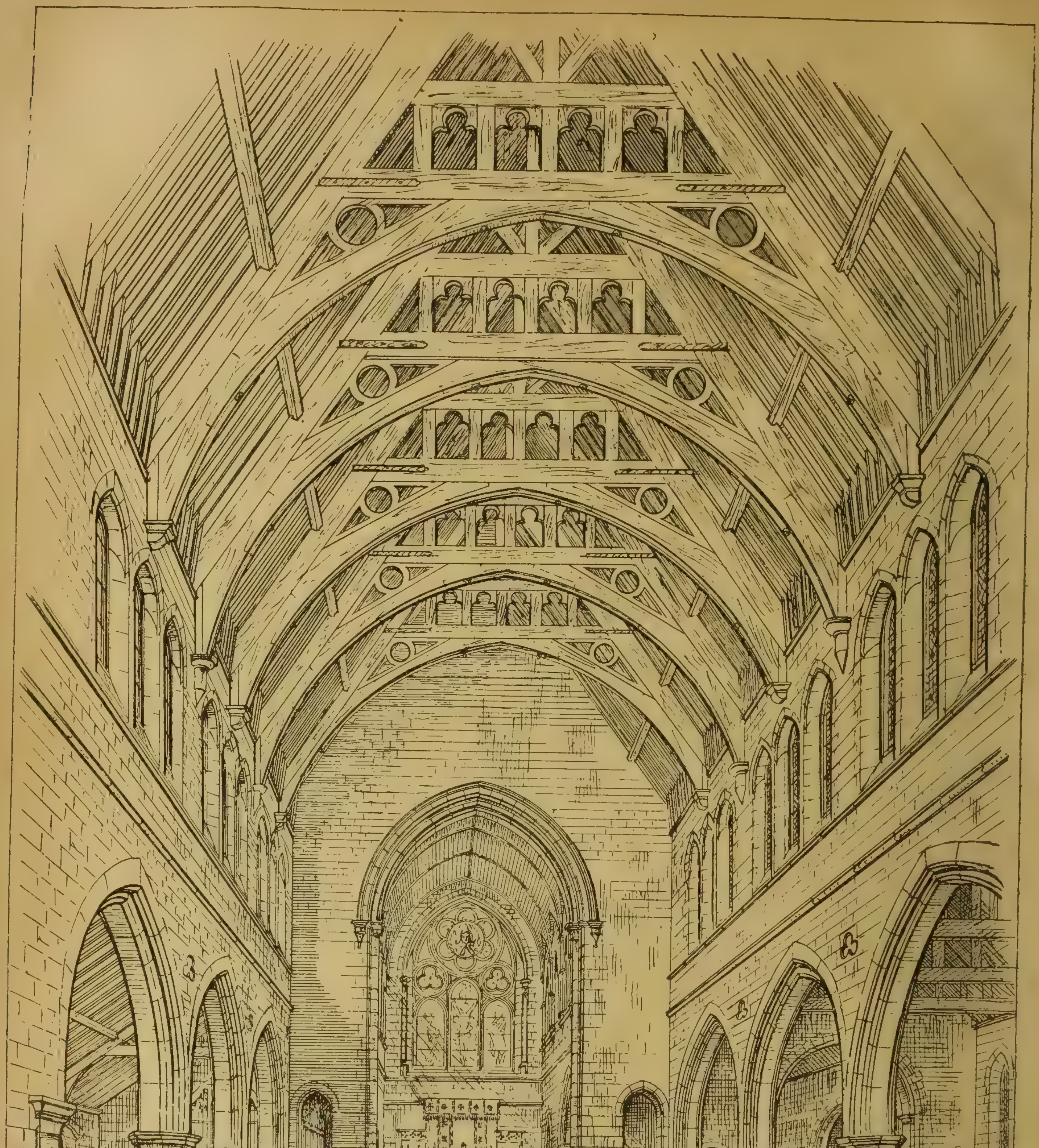
The urban district council of Paignton, South Devon, have adopted a report on the new water scheme. The proposal is to bring a water supply from Holme Moor, Dartmoor, to purchase 700 acres of land, and to construct a reservoir holding 180 million gallons. A dam will be constructed 50ft. high and between 400ft. and 500ft. long. The water is to be conveyed to Paignton by a 9in. main. The cost of the land at Holme and Marldon is estimated at £8,000, and the remainder of the scheme, reservoirs, pipes, &c., is put down at £38,198, making together £46,198 10s. for the entire scheme.

Some time ago a proposal was made for the erection of a new pier and pavilion for Ayr. A minute has now been signed between the magistrates and council on the one hand, and Mr. Purves, C.E., Edinburgh, on the other, on behalf of a company to be afterwards formed. The pavilion is to be fitted with a stage and other accessories necessary for theatrical performances. The term of lease is to be fifty years from 1900, and at the end of that time the council shall be entitled to take over the pier and pavilion at a valuation. Plans of the work have been submitted to the corporation, and generally approved of.

A new Wesleyan chapel was opened at Empingham last week. It has been built by Messrs. Hinson Bros., Stamford, who also supplied the designs. The buildings are Early Gothic in style. They consist of nave, with chancel, minister's vestry, classroom, and schoolroom. The chapel is 46ft. by 27ft., and will seat 225 persons. The schoolroom is 27ft. by 20ft., and will accommodate about 125 children. The roofs are covered with red tiles, the walls are of rough dressed stone, with freestone dressings to the windows, buttresses, and copings. The internal fittings are of selected pitch-pine and varnished.

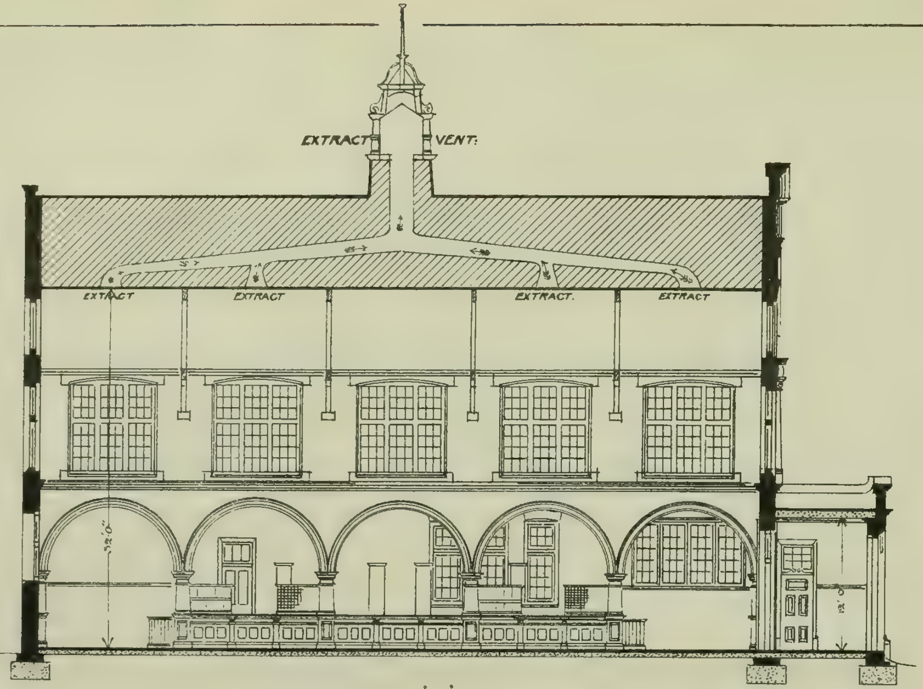
The new workhouse infirmary, Horsham, is being warmed and ventilated by means of Shorland's patent Manchester stoves with descending smoke-flues and patent Manchester grates, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

A meeting of the Glasgow Architectural Society was held on Monday evening in the rooms of the Philosophical Society, Bath-street, Glasgow, when Mr. William Howat, I.M., F.S.I., read a paper entitled "The Measurer and his Work."



HOLY TRINITY CHURCH SHIREBROOK

Hedley J. Price
Architect A.R.I.B.A.
Nottingham



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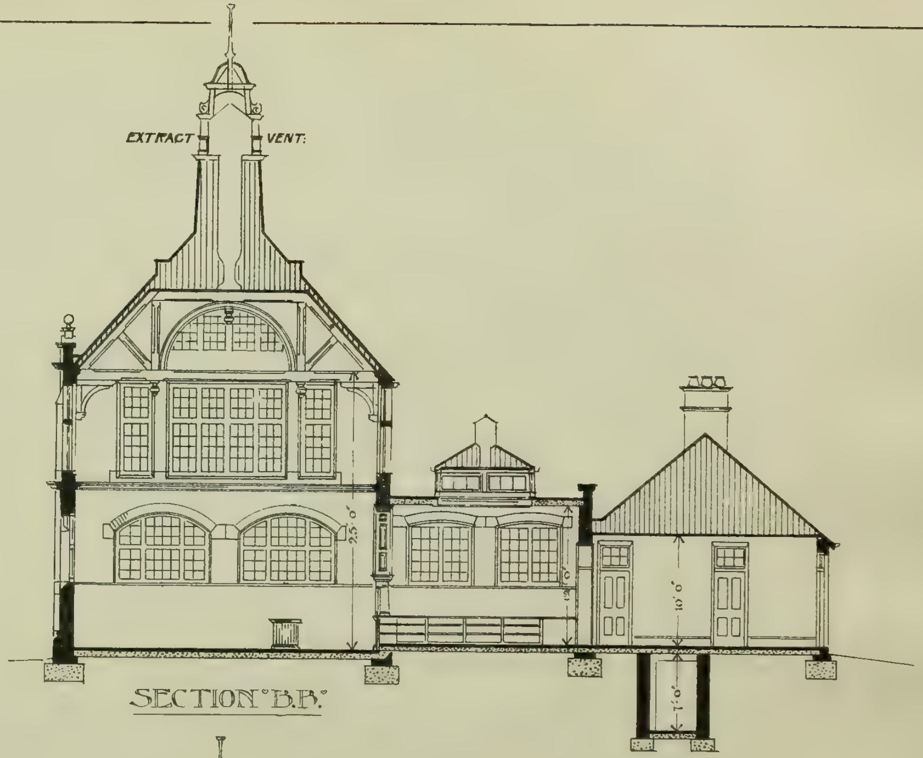

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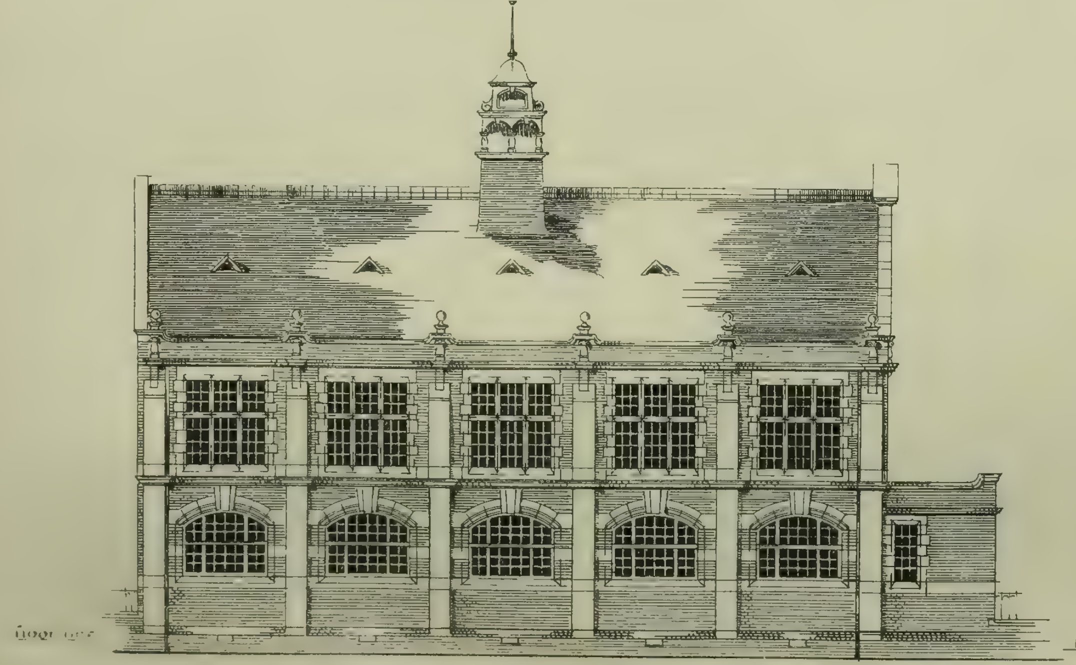
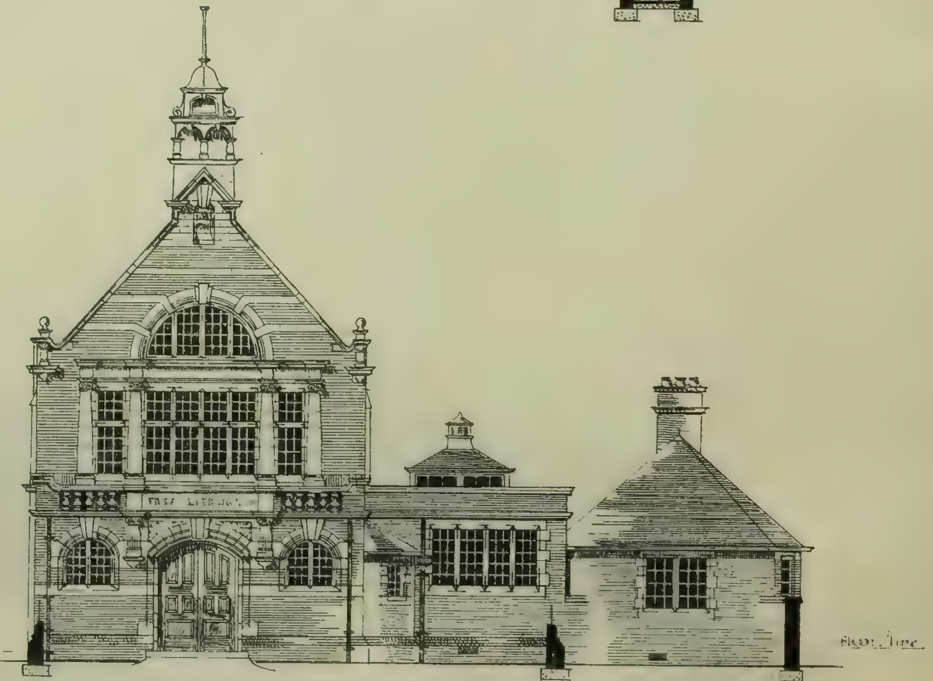


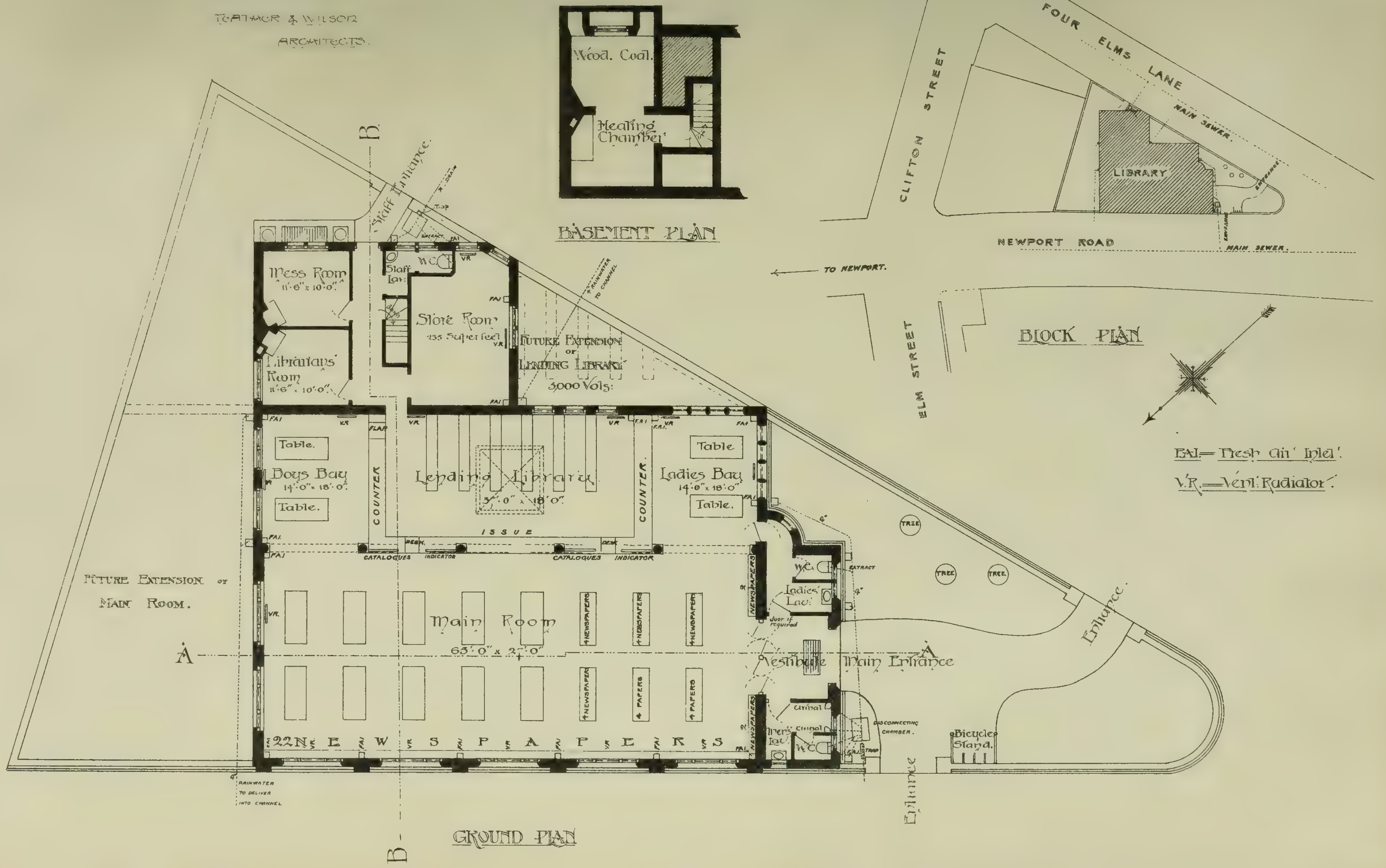
SIDE ELEVATION



PROPOSED·NEW·BRANCH·LIBRARY·
ROATH·CARDIFF·

SELECTED DESIGN.

TEATHER & WILSON
ARCHITECTS.



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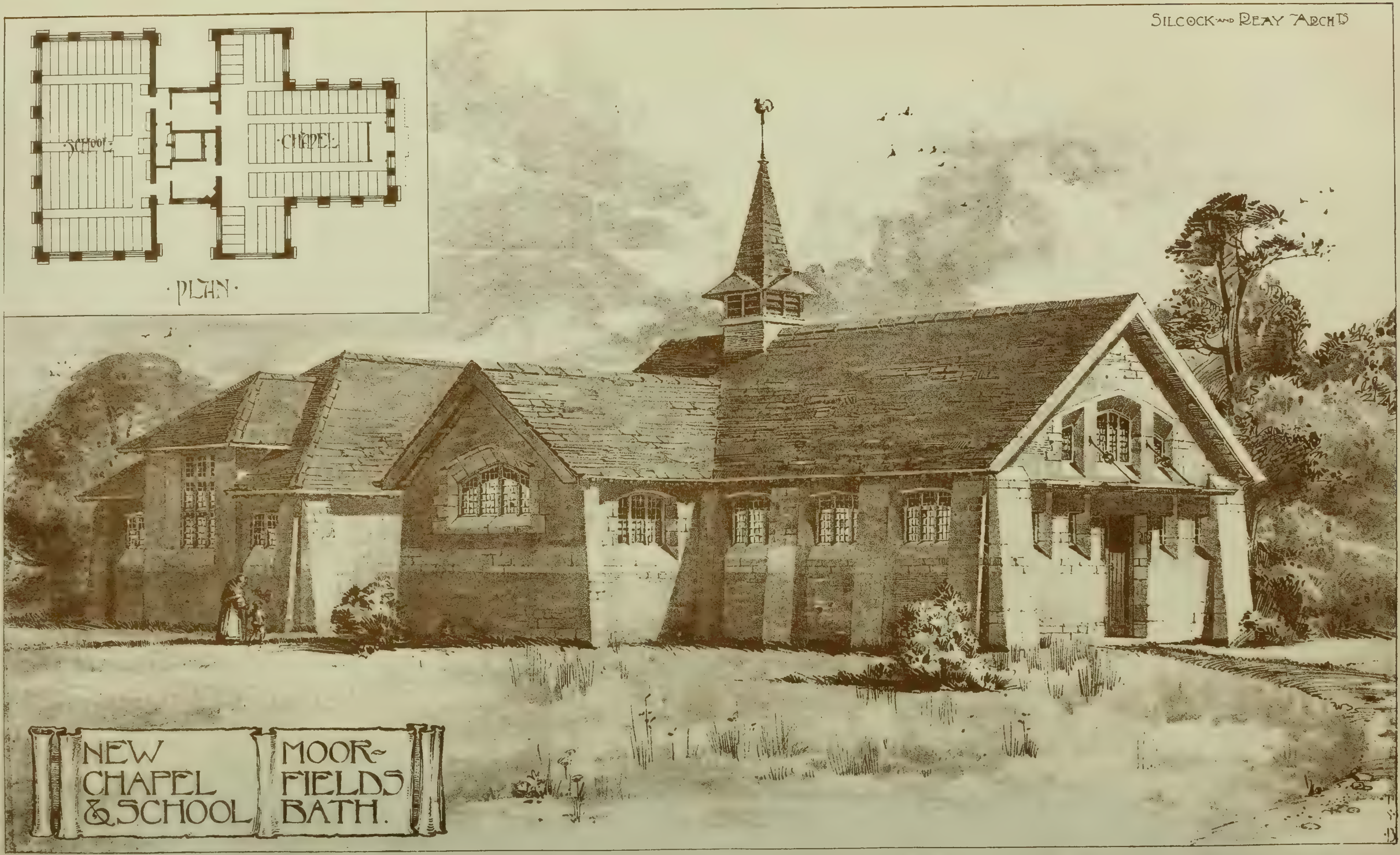
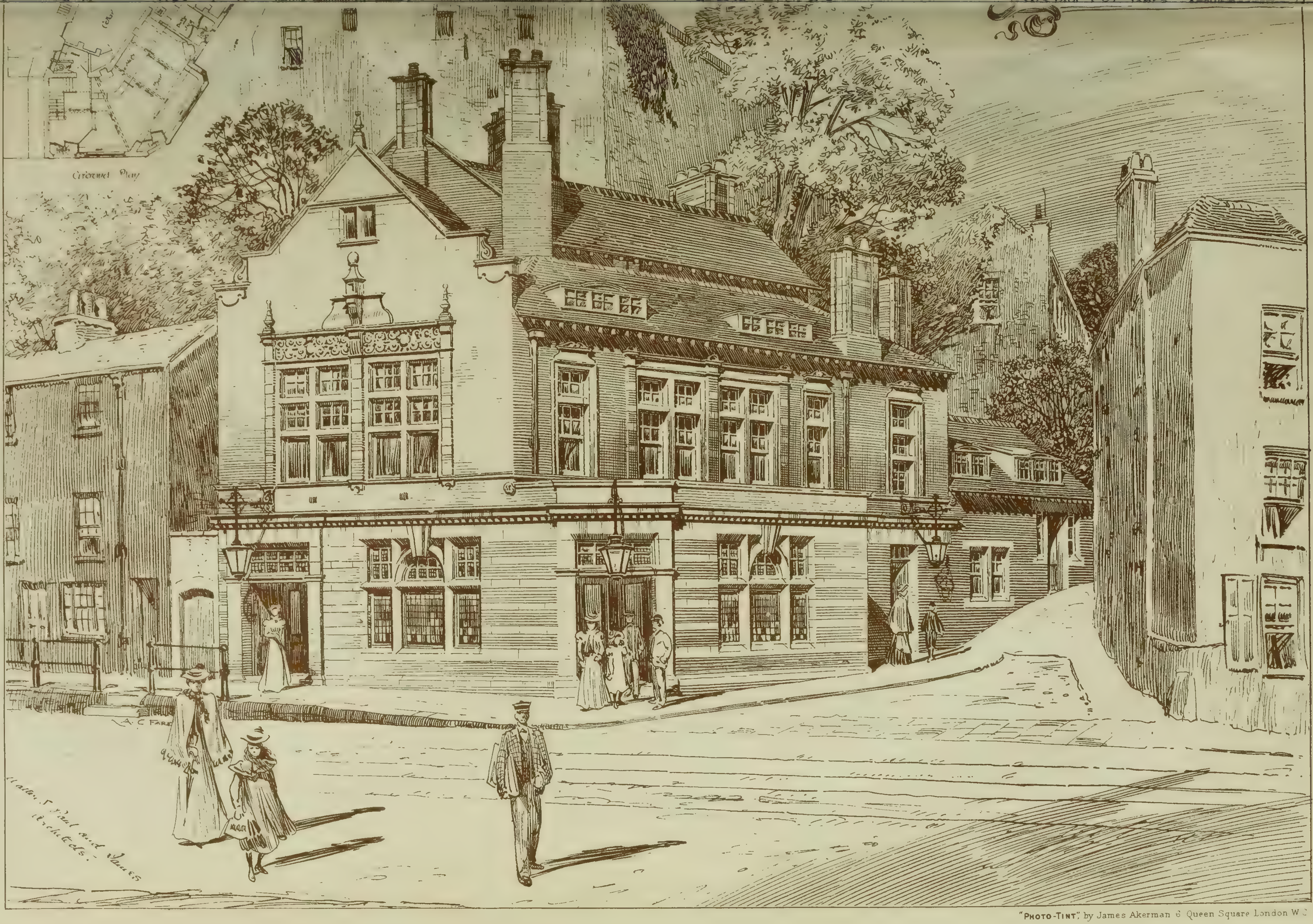
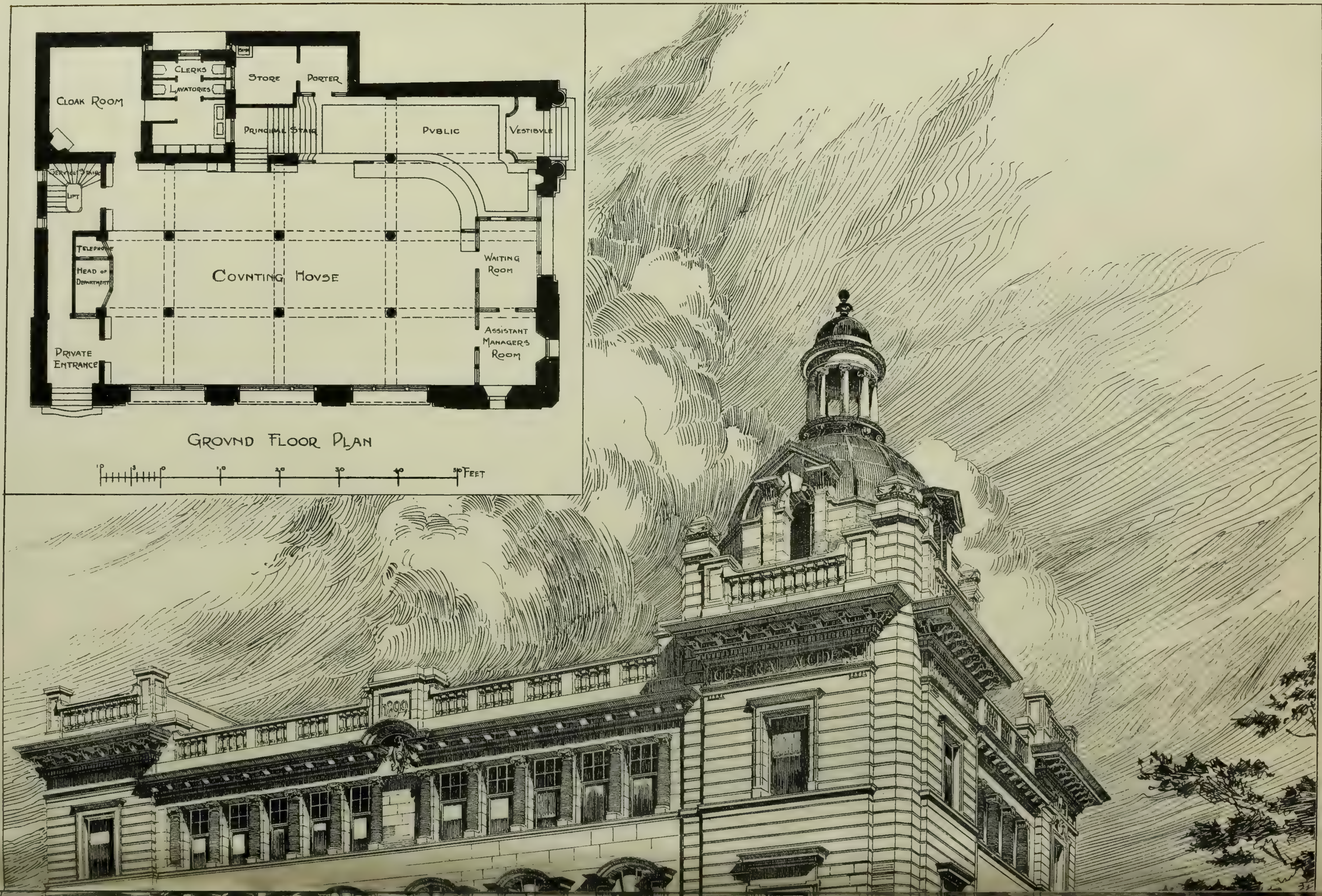

SILCOCK AND REAY ARCHTS
SCHOOL
CHAPEL
·PLAN·
NEW CHAPEL & SCHOOL
MOOR-FIELDS BATH.

THE GENERAL DRAPER
HOTWELLS BRISTOL



"PHOTO-TINT", by James Akerman 6 Queen Square London W.C.



GROUND FLOOR PLAN

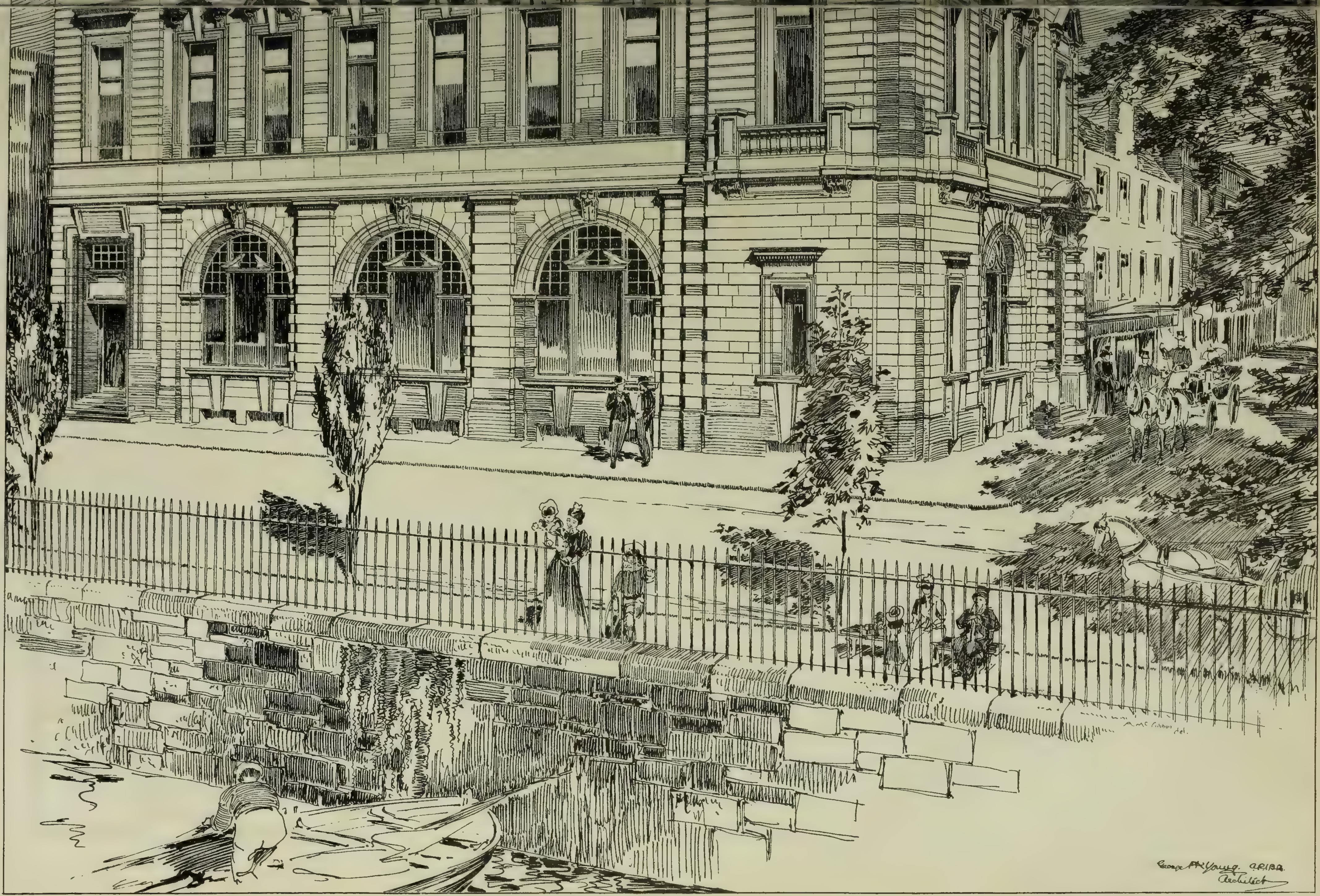
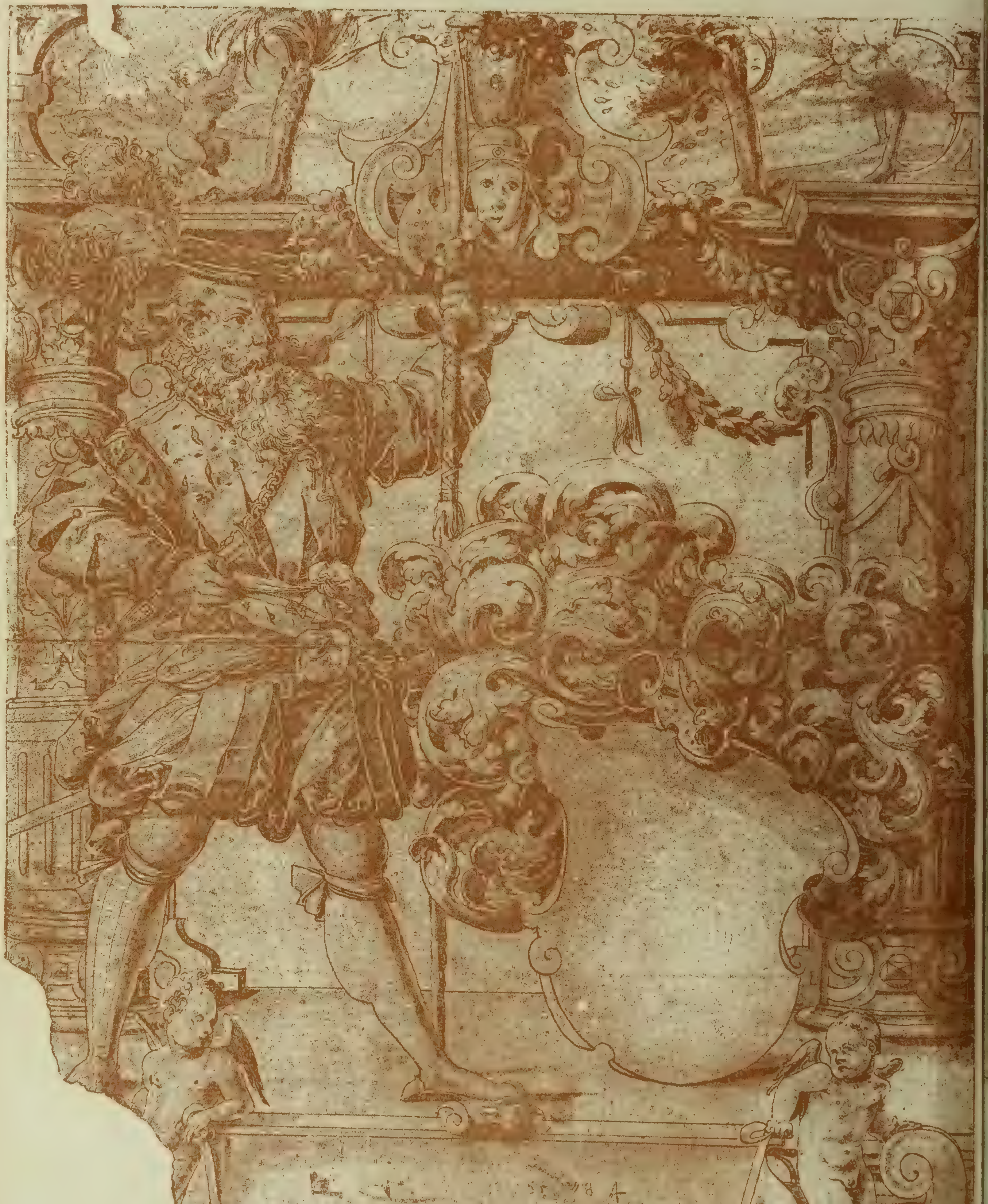
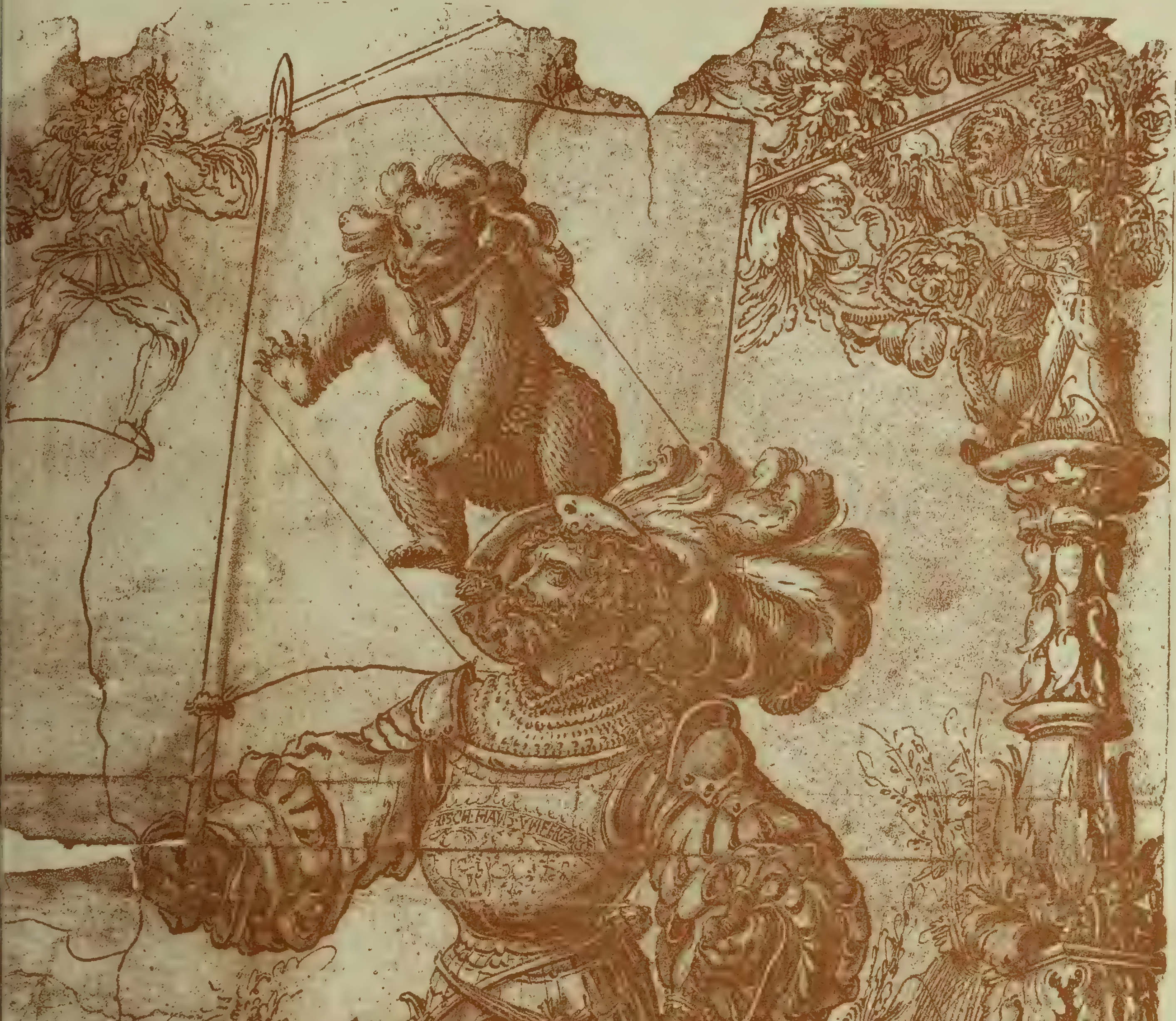

A. McGibbon del.
George P.K. Young. A.R.I.B.A.
Architect

Photo Lithographed & Printed by James Akerman 6 Queen Square W.C.

GENERAL ACCIDENT ASSURANCE CORPORATION NEW OFFICES · PERTH GEORGE · P.K. YOUNG · ARCHT

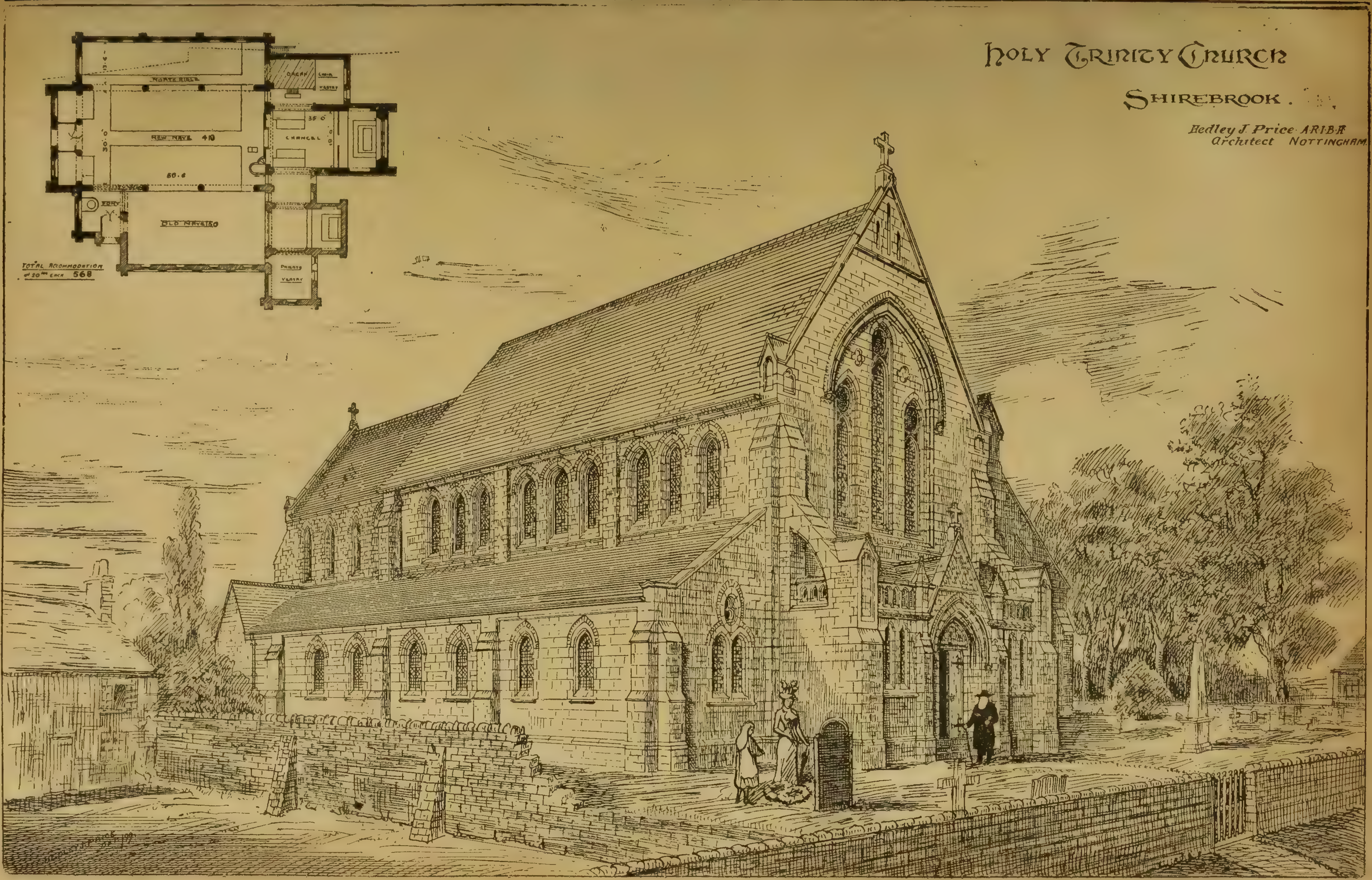


ORIGINAL DRAWINGS FOR PAINT



Glass · Swiss Work · 1539 · 1584 ·

"Photo-Tint"



HOLY TRINITY CHURCH

SHIREBROOK.

Hedley J. Price ARIBA
Architect NOTTINGHAM

Building Intelligence.

Blackburn.—The New Palace Theatre was opened on Monday. There is seating accommodation for over 2,000 persons, with standing room in addition. It is a two-tier house. There are three divisions on the ground floor—fauteuils, stalls, and pit—the popular part being raised as an amphitheatre. The house is of fire-resisting construction throughout, and the proscenium opening is fitted with a fireproof asbestos curtain and water-sprinkler. The prevailing tone in the scheme of colour decoration is Rose du Barri. The house is lighted throughout by electricity, and there will be a novelty on each side of the proscenium opening in a couple of illuminated turn clocks, a labour-saving device invented and patented by the architect. There are fourteen dressing-rooms in close proximity to the stage. Saloons, foyers, bars, and cloakrooms have been provided for each part of the house. The exterior is treated in red brick, with modelled and carved dressings. Mr. W. H. Arber, of J. T. Wimperis and Arber, architects, of Sackville-street, London, has superintended the whole building. The general contractor is Mr. S. F. Davidson, of Newcastle-on-Tyne. The outlay has been about £30,000.

Falkirk.—On Saturday afternoon the new Volunteer Drill Hall was formally opened. The hall, which is built of red sandstone, has a frontage to Comely Park-terrace and High Station-road. The building, facing High Station-road, is a two-story one. On the ground flat there is the armoury (fitted for 300 rifles and equipment), officers' room, non-commissioned officers' room, orderly-room, store, and lavatories. On the upper flat there is a reading and recreation room, and the rooms of the sergeant instructor. Behind is the drill hall proper, which is 100ft. in length by 60ft. wide, and in the rear is a store for gymnastic apparatus, &c. The hall has a plain but substantial front, and on the gable top is carved the regimental crest. Messrs. A. and W. Black, Falkirk, were the architects of the building, the cost of which is about £2,500.

Leeds.—The Leeds markets committee definitely decided on Tuesday to recommend the city council to adopt the plans prepared by Messrs. Leeming and Leeming, architects, Westminster, for the erection of a new market-hall on the site of the present covered market in Kirkgate. Some months ago the committee offered three premiums for the best plans submitted to them. Many designs were received, Mr. W. Emerson, now President of the Royal Institute of British Architects, who was called in as umpire, awarding Messrs. Leeming and Leeming the first premium of £150. The carrying out of their plans it was estimated would cost £73,000. On Tuesday the committee resolved to have the building made 2ft. higher, so as to allow a little more space on the first floor. This alteration will increase the cost by about £7,000, bringing up the total to £80,000. Built of stone, the structure will be two stories high, with a frontage of 275ft. to Vicar-lane, with smaller frontages to Ludgate Hill and Kirkgate. It will cover an area of about 3,000 square yards, or rather more than the present market. The position will be slightly different owing to a strip of land about 30ft. wide being required for making Vicar-lane a uniform width of 75ft. Additional land at the rear, however, will be taken by the corporation of Harper-street, and this will more than equalise the area taken off the front of the present site. The designs show a structure in the Renaissance style, surmounted by domes and turrets. The building is surrounded by twenty-three large shops fronting into Vicar-lane, Kirkgate, and Ludgate Hill. In addition, eighty-six smaller shops are shown fronting in the market. About half of these are in the balcony. In the middle of the market, underneath the central dome, is a large clock, around which are a number of stalls. Altogether, there is a space for eighty-four open stalls. The roof will be of glass, the outside framework being coated with lead, so that when the building is finished, no repainting will at any time be there required. Two main entrances are shown—one at the junction of Vicar-lane and Kirkgate, the other at the corner of Vicar-lane and Ludgate Hill. Over each of these is a dome. The decision of the committee, of course, requires the confirmation of the city council before tenders can be invited to carry out the work.

Maida Vale, W.—Mr. William Urquhart, L C.C., on Saturday afternoon laid the foundation-stone of a new fire-station at Edgware-road, in the Maida Hill district. The station which is about to be built has been designed upon lines embodying the most recent experience of the Fire Brigade. The accommodation to be provided will be :—On the ground floor, the engine-room for one steamer, one horse fire-escape, and one hose-cart, while one additional escape will be kept in the yard ; watch-room, recreation-room, and stable for four horses. On the upper floors will be the tenements for occupation by one station officer, nine married firemen, and two coachmen ; and in the basement will be arranged the workshop, coal stores, stoking apparatus, and other accessories. The building, which will be lighted by electricity, will be erected by the Works Department of the London County Council at an estimated cost of £13,210, in addition to £7,200 paid for the site. It is expected that the building will be ready for occupation in August, 1900.

Neilston, Glasgow.—The Glen Halls, Neilston, the gift of Mrs. Glen, were opened last week. They are Scotch Renaissance in style. The lesser hall occupies the whole frontage of the upper floor, and is lighted by mullioned windows. The frontage is built of red freestone, the steep-pitched roof slated with light sea-green slates, finished with red ridge tiles, and a circular ventilation turret with a flat-domed roof, covered with copper, is placed on the ridge. The main hall, which seats 440 persons, has a coved and panelled ceiling, the central portion showing an open-timber roof. On each side are circular-headed windows, glazed in tinted glass. A small gallery with panelled front runs across one end of the hall, and at the other is the platform, retiring-rooms, kitchen, lavatories, &c. The lesser hall seats 200 persons, and is decorated in keeping with the main hall. The buildings are heated by hot-water pipes and radiators. The architect is Mr. John B. Wilson, A.R I.B.A., Glasgow, Mr. John Young being the clerk of works.

Norwich Cathedral.—The dedication of the new organ erected in Norwich Cathedral took place at a special service held on Tuesday in the nave, which has recently been cleaned from whitewash and paint, and restored through the munificence of Sir Samuel Hoare, M.P., and Lady Hoare. Mr. Hugh Barclay has given a celestial organ, and the keyboard is connected by means of an electric cable with pipes placed at the extreme east-end of the cathedral, 300ft. from the main organ, which is erected on the screen. The wind is supplied by a gas-engine placed outside the cathedral, which works power pumps, the pressure being conveyed in pipes to the north triforium, and there used to operate four hydraulic engines, which are under the immediate control of the organist at the keyboard. Messrs. Norman and Beard, of Norwich, were the builders of the instrument.

Poplar, E.—The foundation-stone of the Island Baths, Glengall-road, Millwall, was laid on Thursday in last week. The building, which is to be erected by the Poplar Vestry upon land between West Ferry-road and Millwall Dock, will have a frontage of 110ft. and a depth of 230ft. There will be men's second-class private baths for forty, men's first-class for nine, and women's baths for five, and a large plunge-bath available for all. A main corridor, 8ft. 6in. wide and 45ft. long, will be placed in the centre of the building. The slipper-baths will have slate divisions, painted for second class and enamelled for first class ; the more expensive baths will be porcelain, and the others of enamelled iron. The lighting and ventilation will be by windows placed about 13ft. above the floor. The pond of the plunge-bath will be 75ft. by 35ft. ; 3ft. 6in. depth of water at the south end, and 6ft. 6in. at the deepest part near the north end of the bath. Dressing-boxes of Oregon pine, with little front doors, will be put round the bath on the level of the platform, and there will be a gallery on all sides. The architects are Messrs. Clarkson, of High-street, Poplar, and Bloomsbury. Messrs. F. and T. Thorne, local builders, of Manchester-road, Cubitt Town, have taken the work by contract for £10,400. The superstructure will be of stock brickwork, with red bricks sparingly used. Welsh generally and green Westmoreland slating for front, and granolithic for the floors, including the gallery floor, are employed.

Rochester Castle.—The repair of the fore-building of the ancient keep of this castle, which has been carried out under the supervision of Mr. George Payne, F.S.A., secretary of the Kent Archæological Society, is now completed. The battlements were found to be in a very ruinous state, while the eastern wall of the chapel, the remains of the roof of the chancel, and the chancel arch were also in great need of restoration. The original Norman masonry has been disturbed as little as possible. During the repairs to the roof line of the nave, a fine Norman two-light window was discovered blocked up in the south wall (the north wall of the keep), and this has been opened by the removal of the plastering. Another interesting discovery was made in the State dungeon, an air-shaft communicating with the lower dungeon being found and opened.

CHIPS.

Berlin is soon to have an architectural museum on a large scale. It will be built on a site near the Royal Technical College at Charlottenberg.

Another antiquarian discovery of interest has been made at Dorchester, Dorset. Workmen who were engaged in making excavations for the erection of a new branch of the Devon and Cornwall Bank in South-street came upon a Roman pavement of large dimensions and elaborate design. The *tesseræ* are unusually small, and some of the colours uncommon. Great care is being taken in unearthing the relic, which the directors of the bank have decided to present to the Dorset County Museum.

Permission has just been obtained from the Dean and Chapter for a memorial to the officers and men of the 1st Battalion Buffs (East Kent Regiment), who fell in the Chitral and North-West Frontier Campaigns, to be erected in the nave of Canterbury Cathedral. The ceremony of unveiling the memorial will take place in January.

John Crowson, described as an architect, was charged at the Birmingham Assizes with the wilful murder of Sarah Ann Dolman, with whom he cohabited. The woman was discovered on the kitchen floor on the morning of November 25 with a wound through the right ear. The evidence of medical men who examined the body differed, and the police surgeon said the wound might have been caused by a fall. The jury said they were agreed that there was no case. Prisoner was discharged.

A complimentary dinner was given on Tuesday night, at the Criterion Restaurant, to Sir John Donnelly, on his retirement after forty years' service as head of the Department of Science and Art at South Kensington. Sir John Gorst, M.P., vice-president of the council, occupied the chair.

The Bolton Streets Committee have recommended the appointment of Mr. A. L. Morgan, A.M.I.C.E. deputy engineer for the borough of St. Helens, to the post of borough engineer for the Bolton Corporation. The salary is £600 per annum. Mr. W. H. Brown is promoted to be assistant borough surveyor, and Mr. Brockbank, the present surveyor, becomes consulting engineer.

At a meeting of the Abbey Restoration Executive Committee, held at Bath Guildhall on Friday, Mr. T. G. Jackson, R.A., the architect, was authorised to proceed with such work on the west front and other portions of the fabric as the committee felt justified in undertaking. It was announced that Mr. John P. Carrington, of London, had expressed his willingness to undertake the cost of the carved canopies over the Apostles St. Peter and St. Paul at the west front. The cost will be over £150, and the committee gladly accepted the offer.

The ancient church of St. Chad, Stowe, Staffs, has for some time past been undergoing restoration. The old, high-backed, inclosed pews are now to give way, in the south aisle, to open seats. They have been constructed by Mr. R. Bridgeman, of Lichfield, from the designs for the restoration of the church prepared by Mr J. Oldrid Scott, F.S.A. The seats are of solid oak, erected on a foundation of concrete, with wood blocks. The new seats were dedicated by the Bishop of Lichfield on Sunday.

Mr. John Bothams, city surveyor of Salisbury, appointed in 1853, celebrated his golden wedding last week. Previous to his appointment at New Sarum he was engaged on the Blackwall Railway, with the stationary-engine system, and then at Amsterdam as one of the engineers during the construction of the waterworks. He is still in good health, and takes part with his son, the assistant city surveyor, in the discharge of the duties of the appointment.

The new buildings for the Royal London Ophthalmic Hospital, erected in the City-road, at a cost of £80,000, from plans by Mr. Keith D. Young, were formally opened on Thursday in last week. The sale of the old hospital in Moorfields, adjoining Broad Street Station, realised £78,000, and in the new building 138 beds can be provided.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

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Received.—B. of T. W.—J. W. V. and Co.—G. P. L.—Drummer.—J. T.—Stucco.—S. H. Bros.—Parvise.—M. M. and Co.—L.—N. D. R—A. C.—D. R. and Co.—E. and Co.—J. C. L.—P. P. and Son.—F. and Co.

Sinker.—Well puddled clay really stands as well; but they can make you put in concrete.

Admirer.—Principally from 1867 to about 1875. Always brilliant and instructive, as you say; but personally terribly unreliable.

Seaside.—Beach shifts so, that is the worst of it; how would an old-fashioned red-tile path do?

Owner.—Diespeker and Co.; Geary, Walker, and Co.; Mainzer and Co., Ltd.; Mosaic Manufacturing Co.; or J. and H. Patteson. See "Directory" pages for addresses.

Troublesome.—You want no sunk stokery with one of Messenger and Co.'s "Loughborough" boilers.

Noisy.—Pug the floors with silicate cotton.

C. T.—Ewart's "Empress" chimney-pot is an excellent one.

Correspondence.

HOWARD'S GARDEN CITY.

To the Editor of the Building News.

Sir,—Considering that the "housing problem" is forced upon us mainly by Cobbett's "great wen" of London, about half of whose present people we would transport to a better city or cities, the question whether we aim at a single model Metropolis, or at 70 or 80 new cities, like Mr. Howard, would seem, as Mr. Lander says (p. 764), a "vital point." If he "has done well to take a firm position," it narrows the scheme immensely. In the *Echo* of Friday, Dec. 8, he was asked, "Is your association a close body, Mr. Howard?" and answered, "It is open to all men and women who are ready to help forward the scheme." Now, if this means the scheme for numerous garden cities of 32,000 each, and that, as said in the *Echo*, "before the population reaches 30,000 a new town must be built," involving a new purchase of another 6,000 acres, a new municipality, new drain schemes, new water supply, a new town-hall, and other buildings, &c., I cannot think many shareholders are to be expected. I should gladly help in a scheme for a single garden city, free to expand to a million at least; but the limitation to 32,000 would repel me, and I should think most of the employers (or "manufacturers," as they are popularly but wrongly termed) that he anticipates as shareholders.

The reference to the Israelites' camp (p. 687) was merely to show that the idea of housing a population approaching that of London in a small space is not new, nor involving unhealthiness. This, indeed, the mere fact of London's death-rate being now lower than that of most other capitals, and of hundreds of smaller cities, proves of itself. In describing my plan, founded on avoiding right angles, and substituting those of 120° I purposely avoided any details beyond those of Mr. Howard's plan, and, therefore, the number of stories and way of filling up the hexagons. But when Mr. Lander attacks it, he is self-contradictory. First he says I have "no arteries," and then that foot-passengers "have to cross a main street at every few yards." In fact, the latter would better describe Howard's plan in "To-morrow," where the blocks, instead of being all alike, are of four most awkward shapes in 18 different positions as to bearings. The traffic would there "have to wend its circuitous and tedious way as best it might." The crossings in my plan are two in every 230 yards, or 15 per mile, not an unusual number in modern London. The division of streets into broad and narrow which he takes thence hardly exists in Paris, and is utterly purposeless in a well-planned town, where all carriageways are thoroughfares. In fact, the three railway streets in my plan are the only ones I would give the width of 52ft., and reduce all others to 39. All being equally arteries or thoroughfares, none have any claim to be wider than others.

My general notion of the hexagons was to make their outer fronts the only dwellings, their inside being the place for factories. But in some of them the whole might be dwellings, approached by footway streets running north and south. Examples in London of this kind of street, but unluckily placed the worst possible way east and west, are Cecil-court and St. Martin's-court, from St. Martin's-lane to Charing Cross-road. But where there are schools, a wider court would serve as a playground. But where factories occupy the interior, they might cover the whole space in their ground floor, the upper floors being limited in an east and west direction, leaving the ground floor to be lighted by skylights. All ranges of building, except the northward fronts of each hexagon, are meant to run meridionally, each side receiving sun half of every day.

Heights must be limited, except at the six corners of a hexagon, which may be like towers. The four fronts that look north, east, and west might be limited to 80ft.; the other meridional buildings to once and a half the clear interval between them; but the two south fronts limited to 10ft., so that every court or passage would receive sun every day—its south wall, 10ft. high, being the only one always shaded.

The remarks about the difference between a park and open country seem intended to apply against Howard's city and in favour of mine. He has a ring of London-like town around a central park of 145 acres, smaller than St. James's Park. Mine has six parks, as I call them, but really open country unenclosed. The "vast and ugly growth of modern cities" is entirely prevented, and every dwelling is within half a mile of open country. This remains truer for a city of 600,000 than Howard makes it for 32,000. All have "immediate daily contact with all forms of beauty, of which the greatest is Nature herself." Of course it is obvious that an A.R.I.B.A. prefers the prospect of 80 new cities to that of one only. But AA.R.I.B.A. are not a kind of creatures meant to exist in our model community. Cities of at least 600,000 are eminently necessary and desirable in these days.

The naming of streets again is shown, by p. 764, to be a matter of first-rate importance. We want no Effingham House, Arundel-street, that has no connection with Effingham or Arundel. Arundel-street may be a very fit name for the way leading from a Sussex or Surrey town towards Arundel. But the houses therein want numbers, and Effingham House is hardly admissible anywhere. Even "Conservative" Britishers have rejected such naming of houses.

A single garden metropolis is what most of us desire to found, and not 80 or 100 garden-cities falsely so called.—I am, &c.,

E. L. Garbett.

THAMES BARGE MATCHES.

Sir,—My firm has received a copy of the circular signed by Mr. J. A. Farnfield, the hon. sec. of the committee of the Thames Sailing Barge Match, stating that it is not considered prudent to hold a Sailing Barge Match in 1900.

As in this circular my firm's name is mentioned, I am desired on their behalf to say that their objection to the Thames and also Medway barge-sailing matches is that the bonâ fide working barges have been excluded.

For reasons well known, the registered tonnage of over 90 per cent. of the barges working in the Thames and Medway does not exceed 45 tons. My firm have the courage of their convictions, and I am desired by them to say that they are willing to offer a cup of 100 guineas, to be sailed for under the following conditions:—

1. To be sailed for three years, commencing in 1900. In the fourth year the winners of the three preceding years to sail, and the cup to be the absolute property of the winner of such race.
2. The winner in any one year not to sail again until the fourth year.
3. The race to be sailed in the Thames Yachting Week, and the course to be from Gravesend either to the Nore and back or to the Medway.
4. The race to be confined to barges not exceeding 45 tons registered tonnage when measured after building, such barges to be registered not later than the 31st of January in the year preceding the race, and to have carried not less than six cargoes before such race.
5. To carry only working sails—*i.e.*, mainsail, topsail, jib topsail, mizzen foresail. No bowsprits to be allowed. Such sails to be inspected and certified by the committee not later than the 30th of April, and to be continuously used in the barge up to the race.
6. A time allowance to be made for sail area; all barges with a depth of side exceeding 5ft. 8in. to give a time allowance for every inch over such 5ft. 8in.
7. Barges carrying over 100 tons burden to be allowed time for every ton over, subject, of course, to rule 5.
8. The winner of the third race, being a newer barge, to give a time allowance to the winner of the first and second years. This is merely suggested as an endeavour to make the final race as fair as possible.
9. Only four hands to be allowed. The captain and mate (who shall have been employed continuously from the 30th April) to be the only ones to steer.

If these proposals meet with approval, my firm would suggest that a committee be formed to carry out the races under these conditions, and suggest that such committee consist of two members to be nominated by the Kent and Essex Brickmasters' Association, two by the Committee of the Thames Sailing Barge Match, two by the Sailing Barge Owners' Protection Society, two by the Sittingbourne Barge Owners' Protection Society, two by Eastwood and Co., Ltd.

Before finally settling the conditions, my firm would be, of course, very glad to receive any suggestions upon them.—I am, &c.,

George E. Wragge, Secretary.
Eastwood Ltd., 47, Belvedere-road, S.E.

[Surely, in the interests of an admirable recreation, and the Thames barge traffic, this spirited offer will be quickly responded to?—Ed. "B. N."]

The Mayor of Bath, Mr. R. E. Dickinson, M.P., laid on Friday the foundation-stone of a new hotel which is to be erected on the Slaughterhouse and Orange Grove site. The architect is Major Davis, F.S.A.

The Society of Ordained Surveyors has now completed consideration of the new rules for the admission of members, and a summary of them has been issued by the secretary, Mr. Forrest Lightbody, 56, Queen-street, Edinburgh, for the information of the public. It sets forth the conditions of apprenticeship, and of the preliminary and final examinations necessary to qualify for admission to the society.

Intercommunication.

QUESTIONS.

[11387.]—**Gable.**—A. and B. agree to build two houses together on a building estate, the cost of such houses to be paid between them; but A.'s house is an end house, and abuts on to a street. He therefore has to build a thicker gable wall than B. He also ornaments the gable, for which extras he pays over and above his half payment. B.'s gable adjoins site bought by C., who will recoup B. for half the cost of his gable. A. wishes to share in this transaction of B.'s, but B. objects to pay him anything, saying that he is not entitled to a share. If someone would make this point clear, he would greatly oblige.—Young Architect.

[11388.]—**Italian Renaissance.**—Can any reader recommend me to a really good work on Italian Renaissance, with plenty of illustrations and designs and details?—James Odgers, 18, Frances-street, Truro.

[11389.]—**Stress in Roof Truss.**—A truss or pair of principals 22ft. span, and with an angle at apex of 62, is framed with collar, arched rib, and wall-posts, which latter rest on an inner plate. The rib is tongued to the principals and collar, &c., and bolted through. The covering is board and slate. Would there be any thrust at the feet dangerous to the walls 2ft. 3in. thick? How should the stresses be determined by diagram?—A Learner.

[11390.]—**Sanitary Fittings.**—In pricing these, what discount is usually allowed to the trade.—A. T. C.

[11391.]—**Separation of Shop from Dwelling-House.**—Section 74 deals with this question, but I believe it does not apply to public-houses which are let as dwellings over the shop if they are fully licensed. Where can I obtain any decision of such a case?—A Builder in Doubt.

REPLIES.

[11370.]—**Square and Cube Measurements in Quantities.**—I do not remember any book that will give the square and cube measurements required in quantities. There are books of tables giving the square and cubical contents of timber, but they would be of little use in assisting the squaring out and cubing of dimensions which the quantity surveyor requires. I do not see any difficulty in compiling tables showing at a glance the squares and cubes of feet and inches. They would be very useful even as a mode of verifying calculations that are both laborious and irksome.—G. H. G.

[11377.]—**Concrete.**—"G. L. Sutcliffe on Concrete," 7s. 6d., Crosby Lockwood and Co., gives ratios of strength of aggregates. Material mixed with cement (in this case Portland).

	Tons per sq.ft.		Tons per sq.ft.
Ballast	49·1	Slag	56 3
Portland stone	100·0	Flints	56·5
Granite	68·6	Glass	58 3
Pottery	74·4		

Longman's "Notes," Part III. 21 gives: "Almost any hard substance may be used when broken up—as broken stone, bits of brick, earthenware, burnt clay, breeze, and shingle. If there is any choice, preference given to fragments of a somewhat porous nature—as pieces of brick or limestone—rather than those with smooth surfaces—as flints or shingle, as the former offer rough surfaces, to which the cementing material will readily adhere. When weight is undesirable, a light porous material, as breeze; but when great weight is an advantage, as in breakwater or seawall, the aggregate may be of the heaviest material procurable. Any aggregate of very absorbent nature should be thoroughly wetted, especially if used with slow-setting lime or cement, otherwise aggregate sucks all moisture out of the matrix, and reduces strength. Size of aggregate generally to pass 1½in. or 2in. mesh. Of aggregates in use, broken brick, breeze, or coke if clean, and burnt clay if almost vitrified throughout, all make very good concrete; gravel and ballast also if angular and clean. Shingle too round and smooth; broken stone varies, the rougher the better; flints too round, smooth, and splintery. Chalk when safe from moisture and frost. Table given:—

Composition.			Crushed at Tons.	
Cement.		Ballast.	Blocks in Air.	Blocks in Water.
1	to	1	107	170
1	to	2	149	160
1	to	3	113	115
1	to	4	103	108
1	to	5	89	99
1	to	6	80	91
1	to	10	48	48

—Regent's Park.

[11377.]—**Concrete.**—The proportions you give will do, but I should prefer broken stone to gravel. The best aggregate is sharp and angular, with a rough surface, so as to form a key for the matrix or cement to adhere to. Smooth gravel or rounded pebble gives no "key" to the cement. The greater part of the stone should pass a 1½in. ring. The sand is best sharp and not too fine. One authority gives one part Portland cement, four parts fine shingle or granite chippings.—G.

[11378.]—**Incrustation on Marble-Tiled Floor.**—Difficult, almost impossible, to keep under whilst there is any lime in cement to effloresce; but perhaps dilute muriatic acid and warm soap and water afterwards might do it. Or heat gallon of water, dissolve 1½lb. potash, and 1lb. of virgin wax, boiling the whole for half an hour; allow to cool, when wax will float. Put wax into mortar and triturate with marble pestle, adding soft water to form a paste; lay this on, and when dry polish off with a woollen rag. Or apply oxalic acid by a saturated white cotton cloth laid on for a short time. If polish is destroyed, repolish with oxide of tin and water with cloth.—Regent's Park.

[11379.]—**Square or Cube Measurements in Quantities.**—If there is any man in London likely to keep such, it is B. T. Batsford, of High Holborn.—Regent's Park.

[11380.]—**Extras.**—It is unusual for a builder to take proceedings to recover the amount of extra work before the architect's certificate is given. If the contract says nothing about extras, I do not see what there is to prevent "A." from proceeding under the circumstances; but under a properly prepared contract he cannot do so before the conclusion of the contract.—Business.

[11381.]—**Penalty.**—Under a duly prepared contract the architect ought to be judge of whether the penalty clause should be enforced. The employer should be able to bring proof that he had been put to loss by default, and if he succeeded in doing so the Court would award the employer such compensation for his loss as they thought fair and reasonable. I should under these circumstances be inclined to give the final certificate in full, and allow the Court to determine the compensation. If the forfeiture is regarded as liquidated damages, then the contractor would have to pay the amount, and the sum should be deducted. The architect is the proper judge in such a question.—G. H. G.

[11382.]—**Connection of Soil-Pipe and Drain.**—There are pedestals or iron standards with iron bends sold to support weight of soil-pipe; these are placed on a bed of concrete. Into the iron bend the soil-pipe is inserted with brass collar, and caulked. But any ordinary length of pipe can be carried by the lead tacks or ears which attach the pipe to the wall. Send for particulars to any sanitary-pipe manufacturer.—Practice.

[11383.]—**Graphic Means for obtaining Stress.**—See Longman's Notes, Part IV.—Regent's Park.

[11384.]—**Surveying.**—Surveying treatises:—W. M. Gillespie, D. Appleton and Co.; G. W. Usill, Crosby Lockwood and Co.; Nesbitt's, by W. Burners, Longmans and Co.; H. G. Merrett, Spon and Co.; T. Baker (late L. and N.W. Co.), Batsford, 94, High Holborn.—Regent's Park.

[11384.]—**Surveying.**—I should recommend "U. T." to get "A Treatise on Surveying," by Middleton and Chadwick, published by Spon. It treats not only of chain-surveying and the use of instruments, but traverse surveying. The subject is practically treated, and the plans and forms of field books, &c., are just what the student requires.—G.

[11385.]—**Sewage Discharge.**—The outfall at Llandudno is carried a distance of 3,587ft. from shore, and entirely in sea-way in the estuary of river Conway, but what the depth at high-water is I do not know.—Regent's Park.

[11386.]—**Articles of Pupil.**—It is usual for the executed copy to be retained by the solicitor who draws up the deed of indentures. Of course, the pupil can have a copy made for reference, if desired. The cost is sometimes paid by both parties. The premium should be paid at the execution of the deed.—A Master.

CHIPS.

At the Local Government Board inquiry held at Harrow last week by Mr. R. Bicknell, M.I.C.E., to inquire into the scheme for the purification of the sewage of Wealdstone, Middlesex, and for sanction to borrow £6,700 for purposes of sewerage and sewage disposal, Mr. C. Nicholson Lailey, of Westminster, the council's engineer, gave particulars of the proposed works of sewage purification.

Mr. J. Ryan, for the past 15 years professor of engineering at the University College, Bristol, having been appointed principal of the Polytechnic Institute at Woolwich, was on Monday night entertained by the members of the Engineering Society in connection with the Bristol University College to a farewell dinner.

The first portion of a new Roman Catholic Church has been built at Custom House, E., and has been opened by Archbishop Vaughan. It is Pointed Gothic in style, and consists of sanctuary, side chancel, and sacristry, accommodation being provided for 300 worshippers, at a cost of £3,300. Mr. Curtiss was the architect.

The city council of Canterbury have appointed Mr. Chatterton, C.E., as engineer for the proposed drainage outfall scheme at a remuneration of 5 per cent. on the amount of the contract, which is estimated at £40,000.

The Liverpool Select Vestry, by 19 votes to 13, ratified, on Tuesday, their former resolution to proceed with the new workhouse buildings at Highfield, Knotty Ash, at an estimated cost, including furniture, not exceeding £105,400.

At the meeting of the Ryhl Urban District Council, on Tuesday, the electric light committee recommended that application be made to the Local Government Board for sanction to borrow £15,250 for the purposes of electric light for Rhyl, and £4,750 for a refuse destructor, and that Messrs. Trentham and Peers, electrical engineers, be engaged to prepare the necessary plans and documents. After a prolonged discussion, the recommendation of the committee was carried.

The death occurred at Bridgwater on Tuesday, at the age of 65 years, at his residence, The Lions, Riverside, of Alderman W. T. Holland, who had served the office of mayor on three different occasions, and had been an alderman of the borough for nearly wenty years, and also a J.P. for the borough. He was at one time partner in the firm of Browne and Co., brick and tile manufacturers, and one of the largest employers of labour in the town.

WATER SUPPLY AND SANITARY MATTERS.

Elland.—Mr. W. O. E. Meade-King, M.I.C.E., held an inquiry at Elland on Dec. 7, relative to the sanction by the Local Government Board of a loan of £1,000 for moneys expended for sewage purposes in excess of the loan of £13,000 originally sanctioned. The engineer, Mr. Malcolm Paterson, stated that the entire scheme had been carried out, and explained the causes of the excess, about one-half of which was due to advance in the prices of material and labour. Dr. Wilson, the West Riding Rivers inspector, stated that the Rivers Board fully recognised the comprehensive method in which the Elland Council had carried out their works of sewerage and sewage treatment, and approved of their dealing with the whole trade refuse of the town at their works at the same time, saying that by more efficient management of the sewage works and a stricter control of the trade effluents admitted to the sewers much better results could be secured. The dry-weather flow of Elland sewage is no less than 50 gallons per head per day, nearly two-thirds of which is trade refuse, consisting chiefly of wool-washing and spent dye liquors. Another difficulty is the immense volume of storm-water from the surface of lands, which was taken into the old sewers at a time when treatment of sewage was not contemplated. Mr. Paterson has advised systematic inspection with a view to keeping out all such land-drainage water.

Ossett.—On Dec. 6 the Ossett Town Council instructed the engineers, Mr. Malcolm Paterson and Mr. Sam Shaw, to forthwith prepare, for submission to the Local Government Board, a scheme supplementary to the proposed Gawthorpe and Pildacre intercepting sewer, for enlarging the capacity of the sewage tanks at the Healey outfall by 150,000 gallons, and the area of the land for treatment by eight acres. It is roughly estimated that the scheme of extension and interception will cost £7,000 to £8,000.

Shrewsbury.—The town council considered, on Monday, a report by the water committee relative to a scheme prepared by Messrs. J. Taylor, Sons, and Santo Crimp, London. The gathering ground is situated at Batchott, on the Shrewsbury side of the Stretton Hills. Its area is 2,040 acres, and the supply is to be sufficient for a population of 35,000 at 30gal. per head per day. The water would flow by gravitation from a capacious storage reservoir to filter-beds at Bayston Hill, and then on to the town, three miles away. The estimated cost is £155,000, the estimated expenditure £7,601, and the estimated receipts £119 over that. The present waterworks debt of £14,950 is not included in this statement, but at the existing rate would be paid off in about five years. This, the committee pointed out, made it a matter for serious consideration whether the Batchcott scheme could be proceeded with until that time had elapsed. The report having been "received," a two hours' debate ensued. Several members were of opinion that the estimates were open to question, and that the council's own surveyor should go through them with the engineer, in order to test them. Other members thought the best plan would be to submit the matter to the financial committee, so that they might consider whether the borough could afford the scheme, even at the estimated price. The latter suggestion was ultimately adopted.

Sir E. J. Poynter, president of the Royal Academy, was presented on Monday with the freedom of the Turners' Company in recognition of his distinguished services to English Art.

The ancient parish church of Stepney was reopened on Friday after restoration at a cost of £4,000. A new side chapel has been erected, the galleries have been removed, the seats have been restored, and a new wooden floor has been put down. The bells have been rehung, the tower repaired, and the organ has been restored. During the progress of the restoration it was found that much good stonework remained in the walls, especially round the arches, which have hitherto been covered with plaster. This has now been removed, and the stonework exposed.

Acting upon suggestions made by Sir L. Alma-Tadema, R.A., Mr. G. A. Storey, A.R.A., Mr. David Murray, A.R.A., and the Hampstead Art Society, the Works Committee of the Hampstead Vestry have decided in favour of allowing the small hall of the vestry-hall, on Haverstock-hill, to be used as a temporary art gallery for such donations as may from time to time be given to the vestry on behalf of the borough, pending the probable erection of a permanent building for the purpose of such a gallery.

At a meeting of the Northern Architectural Association, held on Wednesday in the Art Gallery, Newcastle-on-Tyne, Mr. Frank Baker, the borough surveyor of Middlesbrough, gave a lecture on "Canterbury and Winchester Cathedrals," with limelight illustrations.

Our Office Table.

There has recently been presented to the Scottish National Gallery by Mr. J. Staat Forbes a charming example of the landscape art of John Crome, of Norwich—commonly called "Old Crome" (1769-1821). The painting, the only example of the Norwich school in the Edinburgh collection, is entitled "A Heath—Sunset." Oblong in shape, its size being 49in. by 26in., the landscape shows two heights sloping inwards towards a central valley, with a fine outlook beyond. The hill to the left is wooded, while on the right the rising ground is crowned with a couple of windmills, near to which is a sandpit. Another picture recently hung in the gallery is the diploma work of Mr. G. Ogilvy Reid, R.S.A., which was seen at the 1897 exhibition. It is entitled "After Killiecrankie," the subject being the death of Viscount Dundee, surrounded by a few of his faithful friends and cavaliers. A portrait of the Hon. Bouverie Primrose, C.B., who was for many years secretary to the Board of Manufactures, by the late Mr. Robert Herdman, R.S.A., has also been added to the gallery.

At the last meeting of the Auctioneers' Institute of the United Kingdom, held in their lecture-room, Chancery-lane, under the presidency of Mr. W. Roland Peck, a paper on "The History of Land Tenure in England," was read by Mr. Thomas Bull, who remarked that the history of the subject in England was practically the history of her people. As freedom had been won after many a fierce struggle, so had the condition of the landowner and tenant gradually advanced from a state of actual bondage to one of liberty. The old shackles of feudalism had been shaken off, and no new restrictions could be imposed without the consent of the representatives of the people. The spirit of feudalism, however, still lived in several of our institutions, and the tenure of real property was altogether founded upon feudal principles. No such thing as absolute and unconditional ownership of land existed in England, every tenure being held of a superior lord, the ultimate seignory in all cases vesting in the Sovereign, and being subject to the service of fealty, which was now, however, merely a nominal obligation.

The city council of Liverpool, after many discussions, have at length come to a decision on the question of retaining or demolishing the tower and spire of St. George's Church, one of the landmarks of the city, and an unusually good example of mason work of eighty years since. The recommendation of the finance committee that the tower be pulled down was after a long controversy carried by 58 to 43 votes. The body of the church has already been removed in accordance with a scheme of street improvement, and one of the points which weighed with the members in favour of the act of vandalism now determined upon was the statement that while it would cost about £500 to destroy the tower, from £1,500 to £2,000 would need to be expended in making the eastern face presentable. The proposal was opposed by Mr. W. E. Willink and other architects on the council, and it was mentioned that the tower marks the site of the old Castle of Liverpool.

"Every architect will be interested," says the *American Architect*, "in the decision of the American Institute of Architects to require candidates for admission to its ranks, after January, 1901, to pass an examination. The Royal Institute of British Architects adopted this course some years ago, amid loud predictions of evil consequences, but has since prospered satisfactorily, while membership in it has become more than ever a guarantee of professional skill and ability. There is no reason why the examination of candidates should not have similar results in this country. In fact, the American public has for several years even demanded some sort of test by which capable architects could be distinguished from incapable ones, and the licensing statutes now in force in several States have been the result of this popular feeling."

One outcome of the opening of the Soudan, which Lord Kitchener recently announced, will be the immediate archæological survey of that vast region. The first step in this direction, indeed, has already been taken in the appointment of an inspector of antiquities for Upper Egypt and the Soudan. The Egyptian Government has selected Mr. Howard Carter, who for many years has been identified with the Egyptian Exploration Fund, for this important new post. Mr. Carter is at present engaged at Thebes in completing his work at the temple for the Egypt Exploration Fund; but it is understood that this will be his last season there, and early in the New Year he will enter upon his new duties.

The Hampstead Vestry seem to be no better off, so far as the ventilation of their council chamber is concerned, than the Bristol Town Council, judging from the following extract from the *Hampstead Express*, 2nd inst.: "The vestry clerk read a letter from Sir Henry Harben, J.P., the chairman of the vestry, stating that he had been kept a prisoner in the house all day in consequence of the fog, and could not come out that evening, as his cold had not left him, and he was afraid to run the risk of increasing it. Mr. Colley, upon the reading of this letter, asked if something could not be done to improve the ventilation of the room in which they were assembled without the employment of the electrical rotary fan. Several members of the vestry were suffering from colds, and some of them were due to the draughts in the room. Mr. Francis Smith could scarcely speak, Mr. Chandler was very ill, and he had a very bad cold himself. He asked that the rotary ventilator might be stopped. This was immediately done, though one member said that he would rather catch cold than be asphyxiated."

The sanitary committee of the Manchester City Council resolved on Tuesday to recommend the purchase of an estate of 237 acres in Higher Blackley, within the city, for the erection thereon of dwellings and the provision of gardens and allotments. The price at which the estate is offered is £150 per acre. This is the first effort on the part of the committee to accomplish any work under the Allotments Act, and it is distinctly understood that the purchase is not with the sole object of adopting that Act, but is also with the intention of providing for the housing of the working classes.

The task of pumping out the Hudson River Tunnel, on which work has so long been suspended, and which was to have connected the New York and Jersey railway systems, has again been begun in Jersey City. This resumption of work at the Jersey City terminus is accepted as an indication that the funds with which to continue the construction of the tunnel will soon be secured. The property was sold last June, under foreclosure proceedings, by Randolph Parmley, as Master in Chancery, and ever since then a number of English capitalists have been interesting themselves in the project. Eight men are at work at the mouth of the tunnel, foot of Fifteenth-street, Jersey City, putting things in readiness for further boring.

On Saturday evening nearly a hundred of the craftsmen engaged at the Luckie Horseshoe Studios, Exeter, together with a few outside friends, partook of Messrs. Harry Hems and Sons' hospitality in celebration of the thirty-third anniversary of the head of the firm's advent into Exeter and of his finding his world-famed old horseshoe. One of the large studios was converted into a banqueting-hall, gaily decorated, and with the top table lit by ancient Etruscan and Roman lamps. Mr. Harry Hems occupied the chair, and Mr. Greville C. Hems, his eldest son, the vice-chair. The printed toast list was enlivened by apt quotations from Shakespeare. The Rev. S. W. E. Bird, M.A., Rector of St. Sidwell's, responded for the Church. Mr. Councillor Herbert gave "The Navy, Army, and Auxiliary Forces," and Cyclist H. Turner Hems, 1st R.V., responded. Afterwards Private Gillman, 1st R.V., sang "He's but an absent-minded beggar," during the progress of which Lance-Corporal Farthing, 1st R.V., by a happy thought, went round with the hat, and in a trice £1 3s. was collected for the wives and children of the Exeter Reservists now at South Africa. The toast of the evening, "Continued Success to Harry Hems and Sons," was enthusiastically received and drunk with musical honours. Mr. Hems, in his response, said although he was in the position of an employer, he should ever be a journeyman workman at heart. During the thirty-three years he had been in Exeter he had paid over a quarter of a million of money in wages and in raw material. Mr. Greville C. Hems, Mr. H. Turner Hems, and Mr. Wilfrid P. Wostenholm Hems also suitably responded, and three cheers were given for Mr. William Hems, the fourth son, at present near the front in South Africa. Mr. A. Lucas, F.S.I., M.S.A., replied for the visitors.

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects. "The Architect in Relation to Fire Prevention," by Thomas Blashill, F.R.I.B.A. 8 p.m.
Liverpool Architectural Society. "Windows and their Treatment," by G. W. Fraser, A.R.I.B.A. 6 p.m.
Leeds and Yorkshire Architectural Society. "Modern Building Construction in Chicago," by Richard Wood. 6.30 p.m.

Tuesday.—Institution of Civil Engineers. Discussion on "Combined Refuse-Destructors and Power-Plant." 8 p.m.
Architectural Association of Ireland. "Modern Domestic Interiors," by R. Caulfield Orpen. Grosvenor Hotel, Dublin, 8 p.m.

Wednesday.—Society of Arts. "Bi-Manual Training by Blackboard Drawing," by H. Bloomfield Bare, F.R.I.B.A. 8 p.m.
A.A. Lyric Club. Smoking Concert at Swallow Rooms.

Friday.—Glasgow Architectural Craftsmen's Society. "Water Closets and their Connections," by Isaac Low. 8 p.m.

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CHIPS,

The Gladstone Club, Church-road, Higher Tranmere, was opened on Tuesday. The building is of brick, with Pen-y-cae stone dressings, the front being faced with red pressed bricks. The accommodation includes a billiard-room for three tables, smokeroom, reading-room, and an assembly-hall for 400. A bowling-green is also provided at the rear. The contractors were Messrs. John Lee and Son, Babbington, and the architect is Mr. T. Taliesin Rees, F.R.I.B.A., Birkenhead.

Holy Trinity and All Saints' (Parish) Church, Winterton, Norfolk, has been enriched by the erection of a carved oak screen across the chancel arch. In its general features the screen follows the lines of the 15th-century work in which Norfolk churches are so rich. It has, however, one unusual feature—namely, the side spaces above the lower panelling are fitted with hammered grilles. The upper part is treated with crocketed canopies. The rood beam is also carved. Upon the beam is placed a rood with flanking posts and tracery. The whole was designed by Mr. John Gaymer, North Walsham.

The Board of Trade have given their sanction to the Halifax Corporation borrowing £49,217 for tramway purposes.

Mr. Herbert Ashmead, who for some years past has been one of the assistant surveyors in her Majesty's Office of Works, has been appointed by the British South Africa Company chief inspector of public works in South Rhodesia. Mr. Ashmead is a native of Bristol, being a son of the late Mr. Frederick Ashmead, C.E., who was for many years borough engineer of that city. He sails on the 6th proximo to undertake his new duties.

The Salford Town Council have adopted plans and estimates for machinery, plant, arc lamps, &c., for £335,783, which includes the sum of £87,000 for dynamos and boilers already applied for.

At the meeting, on Tuesday, of the town council of Bradford the town clerk submitted correspondence with the Board of Trade with reference to the requirements of the Board as to connection of electric tramway rails with water mains or earth plates for the purpose of testing for leakage of return current. In consequence of the Waterworks Department having declined to sanction the necessary connection to the water mains on account of fear of electrolytic action setting up, it was resolved that the water committee be again requested to give the requisite facilities for connection of the electric tramway rails to the water mains, and the chairman and deputy chairman were requested to wait upon the water committee to urge them to give their consent.

A report just issued by the Peterborough Cathedral restoration committee states that restoration works involving an outlay of £4,192 have been completed during the past year, and that the committee has now no further funds at its disposal. Further works are still required to be carried out at an estimated cost of £5,000—viz., the restoration of the piers of the west front, the central arch and gable, the north-west flanking tower, the bell tower, the south transept, the north transept, and the columns and paving in the west porch.

A Local Government Board was held on Friday last into the proposal of the Barking Urban Council to borrow £20,105 for the provision of dwellings for the working classes.

New board schools in Locking-road, Weston-super-Mare, was opened on Tuesday. They provide for 400 children, and have cost £5,000 for buildings and fixtures, in addition to £2,000 for the site.

LIST OF COMPETITIONS OPEN.

Dunoon—East Bay Improvement	£100, £50, £25	J. Valrose Clery, Town Clerk, Dunoon	Jan. 31
Doncaster—Isolation Hospital (41 beds)	£25 (merged), £15	F. E. Nicholson, Solicitor, U.D.C. Offices, Doncaster	Feb. 28
Belfast—Assembly Hall and Central Offices	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast	Mar. 12
Harrogate—Northern Police Convalescent Home		The Hon. Secretary, St. George's, Harrogate	—
Glasgow—General Hospital (1,200), Stobhill Estate, Springburn	£200, £150, £100, £50	Jas. R. Motion, Parish Council Chmbrs., 38, Cochrane-st., Glasgow	—

LIST OF TENDERS OPEN.

BUILDINGS.

Stamullen—Additions, &c., to Parochial House	Rev. Wm. J. Davis, P.P.	Anthony Scott and Son, Architects, William-street, Drogheda	Dec. 16
Leeds—Taking Down Retort House, &c.	Gas Committee	R. H. Townsley, General Manager, Calverley-street, Leeds	,, 16
Heckmondwike—Nine Houses in Birkhead-street		Castle and Son, Architects, Market-street, Heckmondwike	,, 16
Bridlington—Business Premises, High-street	J. Wilcock	Samuel Dyer, Architect, Bridlington	,, 16
Abingdon—Hospital	Joint Hospital Board	J. G. T. West, M.S.A., Abingdon	,, 16
Shirebrook—Lock-Up	Standing Joint Committee	J. Somes Story, County Surveyor, St. Mary's-gate, Derby	,, 16
Brydekirk—Additions to Public School		Irving Moffat, Clerk, Kirtlebridge	,, 16
Embleton—Public Hall, &c.	Public Hall Co.	J. W. Carr, Hon. Secretary, Embleton, Christon Bank, R.S.O.	,, 16
Tooreen—Dwelling-House	Charles O'Hara Trench	John Smith, M.I.C.E., Ballinasloe	,, 16
Bridlington—Business Premises, High-street	J. Wilcock	Samuel Dyer, Architect, Bridlington	,, 16
Leeds—Seven Through Scullery Houses		56, Ascot-terrace, Pontefract-lane, Leeds	,, 16
Cork—Repair of Labourers' Cottages	District Council	John Cotter, Clerk, Cork	,, 16
Middlesbrough—Alterations to No. 3 Stores, Corporation-road	Co-operative Society	Robt. Moore, Architect, 27, Albert-road, Middlesbrough	,, 16
Howden—Police Station and Courthouse	East Riding Standing Joint Com.	Alfred Beaumont, C.E., County Surveyor, County Hall, Beverley	,, 16
Grassington—Stabling		T. E. Marshall, Architect, Harrogate	,, 18
Paul—Infants' School at Trewarveth-street	School Board	Henry Maddern, Architect, 26, Clarence-street, Penzance	,, 18
Aberaman—Additions to Stables, &c.	Cwmbach Co-operative Society	T. Roderick, Architect, Ashbrook House, Clifton-street, Aberdare	,, 18
Leeds—Restoration and Additions to St. George's Church		Henry Walker, Architect, 8, Upper Fontaine-street, Leeds	,, 18
Isle of Thanet—Infectious Diseases Hospital	Joint Hospital Board	Langham and Osborne, Architects, 70, High-street, Ramsgate	,, 18
Fleetwood—Board Schools (730)	School Board	Walter H. Haworth, Architect, 15, Mawdsley-street, Bolton	,, 18
Normanton—Business Premises, High-street		Arthur Hartley, Architect, Carlton Chambers, Castleford	,, 18
Weston-super-Mare—Two Cabmen's Shelters	Urban District Council	Hugh Nettleton, Surveyor, Weston-super-Mare	,, 18
Sheffield—Pavilion at Bramall-lane Cricket & Football Ground		J. Nicholson, Secretary, Bramall-lane Grounds, Sheffield	,, 18
Keighley—Cavendish Hotel	Thomas Ramsden and Son, Ltd.	W. H. D. Horsfall, Architect, Tower Chambers, Silver-st., Halifax	,, 18
Bradford—Flying Dutchman Inn, Leeds-road		A. Sharp, Architect, Albany Buildings, Market-street, Bradford	,, 18
Romford—Laundry at Workhouse	Board of Guardians	R. L. Curtis, Architect, 119 and 120, London Wall, E.C.	,, 18
Normanton—Dwelling House, Castleford-road		Arthur Hartley, Architect, Carlton Chambers, Castleford	,, 18
Sedgley—Additions, Upper Gornal School	School Board	A. Ramsell, Architect, Wolverhampton-street, Dudley	,, 18
Harrogate—Home for Incurables (50 Beds)		T. E. Marshall, Architect, City Bank Chambers, Harrogate	,, 18
Ashford—Additional Hospital Buildings, Willesborough Lees	Rural District Council	Horace Hamilton, Clerk, 11, Bank-street, Ashford, Kent	,, 18
London, E.C.—Two Transformer Stations, Great Cambridge-road and Queen's-road	Shoreditch Vestry	J. Rush Dixon, A.M.I.C.E., Town Hall, Old-street, E.C.	,, 19
Burnley—Extension of Goods Yard, &c., Manchester-rd. Station	Lancashire and Yorkshire Ry. Co.	R. C. Irwin, Secretary, Hunt's Bank, Manchester	,, 19
Frome—Stable	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 19
Birkenhead—Wing to Science and Art School	Corporation	C. Brownridge, A.M.I.C.E., Boro' Engineer, Town Hall, Birkenhead	,, 19
Wortley Junction—Alterations, &c.	Lancashire and Yorkshire Ry. Co.	The Engineer's Office, Hunt's Bank, Manchester	,, 19
Blaen Llynvi—Passenger Station	Great Western Railway Co.	G. K. Mills, Secretary, Paddington Station, London	,, 19
Austwick—Wesleyan Chapel		Jno. Ledingham, F.R.I.B.A., District Bank Chambers, Bradford	,, 19
Dearham—Repairs	School Board	J. Russell, Clerk, Maryport	,, 19
Brockholes—Stable, &c.	Industrial Society, Ltd.	F. Buckley, Secretary, Brockholes, West Riding	,, 19
Thornhill—Goods Shed	Lancashire and Yorkshire Ry. Co.	W. B. Worthington, Engineer, Hunt's Bank, Manchester	,, 19
Barking—Ejector Station, &c.	Urban District Council	C. J. Dawson, F.R.I.B.A., Surveyor, Public Offices, Barking	,, 19
Cwmavon—Additions to Schools		Thomas and James, Architects, Port Talbot	,, 20
Neath, Wales—Lodge at Ffrwdvale	Miss Rowland	Cook Rees, Architect, Neath	,, 20
Reading—Additions to No. 7, Broad-street		Frances T. Trepess, Architect, Warwick	,, 20
Chiswick, W.—Additions to Vestry Hall, Heathfield-terrace	Urban District Council	Arthur Ramsden, Surveyor, Vestry Hall, Chiswick	,, 20
Pentre—Infants' School at Stanleytown	Ystradyfodwg School Board	Jacob Rees, Architect, Hillside Cottage, Pentre	,, 21
Swansea—Factory, &c.	Swansea Pure Ice Co.	Freeman, Son, & Gaskell, Archts., Albert Chmbs., Carr-lane, Hull.	,, 21
Ilfracombe—Additions to House at Westdown	J. Chugg	Allen T. Hussell, M.S.A., Market-square, Ilfracombe	,, 21
Birkenhead—Cottage at Ilchester Wharf	Corporation	T. Paterson, C.E., Gas Eng., Gasworks, Thomas-street, Birkenhead	,, 21
Fulham, S.W.—Alterations to 9, Parson's-green	Board of Guardians	A. Saxon Snell, F.R.I.B.A., Southampton Bldgs., Chancery-l., W.C.	,, 21
Nelson—Refuse Destructor	Health Committee	B. Ball, A.M.I.C.E., Borough Engineer, Nelson	,, 21
Ben Rhydding—Additions and Alterations to Hydro	Hydro Co.	Isitt, Adkin, and Hill, Architects, Prudential Buildings, Bradford.	,, 22
Manchester—Pulling Down Buildings, Tame-street	Workhouse Committee	A. J. Murgatroyd, Architect, 23, Strutt-street, Manchester	,, 22
Bootle—Central Fire and Police Station	Corporation	Andersson and Crawford, Architects, 36, Dale-street, Liverpool	,, 22
Ovenden—House and Stable		Jackson and Fox, Architect, 7, Rawson-street, Halifax	,, 23
Rawmarsh—Mixed School, South-street	School Board	J. Platts, Architect, Old Bank Buildings, High-street, Rotherham	,, 23
Gainsborough—House at Waterworks	Urban District Council	Percy Griffiths, A.M.I.C.E., 54, Parliament-street, Westminster	,, 23
Rastrick—Rebuilding Junction Inn	Halifax Brewery Co.	W. Clement Williams, Architect, 29, Southgate, Halifax	,, 23
Whitby—Two Shelter Seats	Urban District Council	Thos. Keat Scott, Surveyor, Flowergate, Whitby	,, 23
Cardiff—Receiving and Lunatic Wards at Workhouse	Guardians	Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff	,, 23
Halifax—Pair of Semi-detached Villas, Moorside Estate		Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	,, 23
Barry—School Board Offices	School Board	George Thomas, Architect, Queen's Chambers, Cardiff	,, 23
Glasgow—Extension of St. Enoch Station	Glasgow and South-Western Ry. Co.	F. H. Gillies, Secretary, St. Enoch Station, Glasgow	,, 23
Braemar—Isolation Hospital	Deeside District Committee	Jenkins and Marr, C.E. and Architects, 16, Bridge-st., Aberdeen	,, 27
Walthamstow—Rustic-Work Bandstand, Forest-road	Urban District Council	G. W. Holmes, A.M.I.C.E., Surveyor, Walthamstow	,, 29
Newcastle-upon-Tyne—Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, F.S.A., Archt., 37, Grainger-st., Newcastle-on-Tyne	,, 30
Donington—Tool-House	Parish Council	A. G. Fletcher, Clerk, Donington	,, 30
Morecambe—Villas and Stables, Grove-street	Mrs. Emary	A. Lancelot Lang, Architect, 12A, Pedder-street, Morecambe	Jan. 1
Cardonagh—Station Buildings	Londonderry & Lough Swilly Ry. Co.	Fred. Dawson, Secretary, Shipquay-street Buildings, Londonderry	,, 1
Borough, S.E.—Strengthening Floors at Stores, 4, Mermaid-ct.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk H., Norfolk-st., Strand, W.C.	,, [illegible]
Cilybebyll—Isolation Hospital	Pontardawe Hospital Committee	John Morgan, Surveyor, Herbert Chambers, Pontardawe	,, [illegible]
West Hampstead—Branch Public Library, Westbere-road	St. John's Vestry	Arthur P. Johnson, Vestry Clerk, Haverstock Hill, N.W.	,, 4
Whitley—Council Offices, Fire Brigade House, and Stores	Whitley and Monkseaton U.D.C.	J. P. Spencer, A.M.I.C.E., 13, Grainger-st. West, Newcastle-on-T.	,, 5
Birmingham—Additions to Coachman's House at Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 6
Swindon—Additional Hospital Buildings	Swindon and Dis. Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	,, 6
Llangollen—Alterations and Additions to Courthouse		The County Surveyor, Denbigh	,, 9
Preston—Post and Inland Revenue Offices	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	,, 10
Birkenhead—Electricity Generating Station, Craven-street	Corporation	C. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	,, 16
Kentish Town, N.W.—Public Baths and Washhouses	St. Pancras Vestry	T. W. Aldwinckle, F.R.I.B.A., Architect, 1, Victoria-street, S.W.	,, 26
Otley—Two Houses, Station-road		A. Marshall, M.S.A., Architect, Otley	—
Mealsgate—Adding 50ft. to Pit Chimney		William Ramsay, Allhallows Colliery, Mealsgate, via Wigton	—
Parkstone—Club Premises, Ashley-road	Heatherland Unionist Club	Walter Andrew, Architect, Alton Office, Parkstone	—
Beeston—Schools, Humber-road		Robt. Clarke, Architect, Prudential Buildings, Nottingham	—
Castleford—Additions to Premises, Carlton-street	E. Millar	Garside and Pennington, Architects, Castleford	—
Hull—Alterations to Imperial Hotel		W. S. Walker and J. M. Dossor, Joint Archts., 2, Manor-st., Hull	—
Raunds—Six Houses, Marshall-road	Robinson and Northern	Harry Knight, Surveyor, Newton-road, Rushden	—
Hemingfield—House and Stable		John Robinson, Wombwell	—
Cloughton—Cottages	H. E. Donner	Charles Edeson, Architect, 5, Huntriss-row, Scarborough	—
Walham Green, S.W.—Block of Flats		Albert G. Hastilow, Architect, 104, Upper Richmond-road, Putney.	—
Southerdown—Additions to Marine Hotel	R. T. Davis	Seddon and Carter, Archts., Bank Buildings, St. Mary-st., Cardiff	—
Horwich—Enlargement of British Schools, Lee-Lane		E. W. Dyson, Architect, 17, Lee-lane, Horwich	—
Cambridge—Corrugated Shed (40ft. by 80ft.)		Pamplin Bros., Cherry Hinton Works, Cambridge	—
Rawtenstall—Showrooms, &c.	Eastwood and Clegg	F. Hobson, Architect, Burnley-road, Rawtenstall	—
Farsley—Eight Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Sheffield—Works, Buildings, &c., Walkley-lane	G. A. Milne	Henry Webster, Archt., St. Mary's Chmbrs., Norfolk-row, Sheffield	—
Whalley Range—Presbyterian Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Belfast—Improvements to Licensed Premises, Roden-street	A. and D. Rooney	W. J. Moore, Architect, Whitehall Buildings, Ann-street, Belfast	—
Muckamore—Repairing and Ventilating Presbyterian Church		J. Hawthorne, Dunadry	—
Rawtenstall—Bakery and Stables	Hartley and Co.	F. J. Hobson, Architect, King-street, Rawtenstall	—
Donhead St. Andrew—Reroofing South Aisle of Church		W. E. King, Donhead Lodge, Salisbury	—
Llanfairfechan—Shop Premises and House	Peter Jones	Richard Hall, Architect, Bangor	—
Rawtenstall—Alterations to Bishop Blaize Hotel		John Baxter, Limited, Glen Top, Waterfoot	—
Carlisle—Cookery School, Ashley-street	School Board	T. Taylor Scott, F.R.I.B.A., Architect, 43, Lowther-street, Carlisle.	—

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STRUCTURAL EMPHASIS AND EXPRESSION.

WHEN the history of architecture of the century fast drawing to a close comes to be written, a great deal of the work done will be pronounced inexpressive and characterless. Utilitarian buildings, as well as those erected for residences and for civil and ecclesiastical purposes, will have to be described as designed without any reference to plan or construction, but chiefly in the outward dress of some pre-existing style—that the art was, in short, imitative, and not based on the wants of the age. At least, much that was done during the years of what is called the Classical Revival, and in those which marked the Gothic Revival—though the two periods to some extent synchronised or overlapped—can be fairly described as imitational. We include the best works in this description, for who would say the "new" church of St. Pancras, the London University Buildings, Gower-street, the British Museum, the General Post Office, the National Gallery were anything else but imitations of Greek temples? Not one of these, not even St. Pancras, can be called expressive of the important functions and purposes for which it was built. No one, coming to London for the first time, could, on merely looking on these buildings, distinguish their uses, except, perhaps, the church in the Euston-road, which became a common model for the churches built early in the century. But who, looking at the British Museum, without knowing its name, would immediately come to the conclusion that it was the great depository of the National antiquities?—though we think, certainly, the style and treatment suggests a large treasure-house of, at least, Classical antiquities. Its dignified and windowless exterior expresses security, at least, in one's mind. Again, is there anything in the Royal Exchange, General Post Office, or the National Gallery to arouse even a faint suspicion that they are what they are? To go further, St. George's Hall, Liverpool, is a noble Classical building of its age, with columns 60ft. high, and worthy of our Classical traditions; but it can hardly be said to declare its use externally. Look at many of the country seats of the gentry built about this time, many of them replicas of temples with wings. From the town-hall to the hospital, architectural expression, if it can be called by such a name, was merely the representation of a style. In this sense there was an expression, sometimes dignified, often exaggerated or caricatured. Heathenish in style certainly many of our Classic churches were when they threw off Christian symbolism for meaningless ornament, urns, and torches. In the case of the town-hall or the local museum, there was not so much harm done in selecting a Greek or Roman model. Later on, in the "fifties" and "sixties," our architecture, though more intelligent, still failed in this quality of expressiveness. We had then two or three styles from which to select. The Classic or Renaissance was chosen for our secular buildings, and the Mediæval for our churches—an appropriate selection; but there was still no expression of plan or structure. The revelation of plan and construction has been reserved for our own time; but are we availing ourselves of it?

The emphasis of structure and of plan is slowly superseding the older imitational methods, and there are many indications amongst the younger members of a rising school that it will quickly supplant the older system. The leaders of what was once called the "muscular" school of architecture, who some time ago rebelled against conventional art, were the beginners, but we have got beyond compromises. Taking the average designs of buildings of our streets and our competition work, we are beginning to see a bolder effort to give expression to plan. There are two kinds of emphasis: that of structure and that of plan—both important motives to work from. These are sometimes synonymous, as they are in a group of semi-isolated buildings, as, for instance, a group of hospital wards, a workhouse, or in a set of public baths. In these and similar buildings, the construction and the plan more or less coincide—that is to say, the structure, the walls, and roofing which form one unit or part of the building is coincident with the plan; they arise out of it. Let us take one block or pavilion of a hospital. The plan and structure agree, they do not overlap. Walls, floors, and roof are dictated by the plan, or should be. If we tried to make the structure disagree, with the plan, say, by making gables at the sides of the pavilion or by cutting up the side walls and roof by a series of breaks with cross roofs, we should be complicating the plan, and it and the structure would not be one. The emphasis of structure and the emphasis of plan would disagree; each would be playing at cross-purposes. The best and simplest design for such a set of buildings is one in which each part or unit is distinguished; a number of isolated ward-blocks connected by one or more corridors is the cheapest and most economic design for a hospital. Each part should tell its own purpose; the plan and structure both should be expressed. In a set of public baths on a cramped or irregular site, open only at two ends or sides, such as those recently chosen for Fulham, the same principle cannot be so completely followed. The swimming-baths may all be placed in a line in plan and be roofed separately or together; but the slipper-baths of each class could not, on a crowded site, be so easily expressed; as they would be placed intermediately or on one side of ponds. Neither plan nor structure could be externally expressed, the parts would be more intermixed, and as only one elevation may be obtainable, and that a narrow frontage: emphasis of the separate parts is impossible. On a longer site where the architect is less restricted, he can, however, make his main baths a visible feature, and this has been done very well at the Kennington-road baths.

In a group of large schools the external expression ought, if possible, to be maintained; the common school-hall ought to be emphasised at least, and the suites of classrooms also expressed, with the minor offices. A few of our London Board Schools exhibit this emphasis of plan and structure combined; in many more the parts are mixed up and confused, and appear as one whole, or under one elevation. In the Royal Academy prize designs we noticed last week for a public school for two hundred boys, we have one design at least in which the author has emphasised the main parts of his buildings. Mr. Hide, in the prize design, has given marked emphasis to the hall or great schoolroom, which is axially placed, against both sides of which are placed the suite of classrooms, forming a lower range of buildings. Both plan and structure are well emphasised, while the external treatment preserves a unity and symmetry. Each part, the hall, the chapel, and classrooms, library, &c., are expressed structurally by distinct roofs and levels. One sees from the outside what the design is intended for. The plan unit and structure fairly coincide. In another design which hung next to this one, the author more explicitly exhibited this principle. The buildings were arranged round a quadrangle, but each one is emphasised both in plan and structurally. The *pièce de résistance* in this design is the chapel, which takes up one side of the square. Isolated and distinct from the other buildings, it is of commanding height and length. Here emphasis of plan and of structure are shown; it helps to explain what we mean by this double emphasis. The plan of chapel is distinct, not joined or connected except by the cloister with the other buildings, and it is also structurally intact. Though severe in its lines, the whole design has this merit: it expresses each building, and gives prominence to the principal feature. In the first design the author makes the school hall the prominent and central part, and groups the other departments round it; in the second there is no attempt at symmetry, but the chapel stands out by itself, severe and dignified in its outlines, without any attempt to unite with the other building. In a third design for the same subject, one may see the ordinary idea of uniting all the separate departments under one roof as far as possible—that is, combining the several parts together under one elevation. The hall, the classrooms, and the chapel are united in one scheme. The design might express a hundred different ideas; but good as it may otherwise be, the plan is sacrificed to the elevation.

In large complex buildings, where the main units are more dispersed and interwoven, the principle of distinct expression is not so easily attainable. To mention as one instance a block of offices where a number of rooms of small size on different floors is required, an external emphasis is almost impossible. Here we have just the opposite condition to a school or hospital, where single-storied and large units occur. We may express a large block of residences or offices by the windows; but there can be no real structural emphasis except in distributing the offices over the site by wings for convenience. In a block of municipal offices we have generally two or three important units; there is usually a large public hall, a vestry hall, and a court of law, each of which can be expressed; but as there are also a number of small offices for the officials, it is more difficult to emphasise the larger parts. They are so interwoven with the offices in a restricted area that the expression of plan is more prominent than that of structure—the two factors of plan and structure overlap. The large hall generally is self-contained and roofed high; but it may be so surrounded by smaller offices, or so interlocked with other parts, that its identity is disguised. If central, it may be brought out, and be made a feature on the main front, or it may be along a side street, and have its own expression. The smaller hall or vestry may be only one story high, and is, therefore, in a less favourable position. But all round it space is wanted for offices and committee rooms — the parts overlap. There may be a good, well-expressed plan, but the construction of roofs and floors are not independent; they do not coincide with the walls, or the roof of some other portion may go over it—therefore, structure cannot be emphasised. In other complex buildings it is the same. A big hotel has several large units and many small ones, and the larger overlap in dimensions and height the smaller units, so that there can be no structural emphasis, unless indeed the parts can be separated by wide areas. Mr. Street, in the Courts of Justice, has given us a good example of both kinds of emphasis; the central hall is semi-isolated and distinct, and the separate courts are also separately treated and roofed. But for the style selected, this design would have been almost as perfect an example as we could have had. In Barry's earlier work, the Houses of Legislature, structural distinctness is disguised behind the façade of Late Tudor, though the plan is better expressed.

In all complex buildings where the area is covered, it is almost impossible to accentuate each of the larger units, to give a different external treatment, or roof, to each without interfering with the unity of the design, so that all the architect can do is to arrange his façades with the nearest approach he can to expression. But in buildings like some of those we first mentioned (those of one unit or compartment), theatres, concert-halls, churches, the structural units are large and important, and can be expressed either in elevation or roofing. The separate units of structure and plan can be made to coincide. The subject is one of large and diverse application, to some of them we may more fully refer; it is one at least of the many ways in which architects can do something in a direction they have hitherto failed to understand.

ORIGINAL PRICED QUANTITIES.

An instructive and important decision in an action of considerable interest to builders and contractors was reported in our last issue. It had reference to a contract entered into by a builder of repute with the Llandudno Urban District Council for Municipal buildings, in which there was a clause to the effect that all additions and alterations, when they came to be paid for, should be made out according to the builder's original estimates, and that the contractor was to furnish the architects, at the time of signing, with a verified sealed copy of the original estimate. This point was contested by the plaintiff (the builder), who said it was not usual with builders in Liverpool or other large towns in the North to furnish a copy of the original estimate to the architects; but the builder undertook to furnish them with a verified sealed copy of estimates. The action was brought by the plaintiff against the district council for having ejected him from the site of the new Municipal Buildings which he had contracted to build, and for loss of profit estimated at 15 per cent. £2,081. We must refer our readers to the report we have given (page 799) for a full statement of the case on both sides. The defendants, in fact, refused to let him go on with the work unless he allowed them to look at the sealed copy, and contended that the architects or their surveyors were the proper persons to verify the sealed copy. Upon this issue, practically, Mr. Justice Cozens-Hardy gave judgment in the Chancery Division of the High Court. The council, he said, took up a position which he had been entirely unable to appreciate. The plaintiff was required not only to furnish a verified copy of his original estimates, which was sealed, but must furnish a copy which was verified by one individual—namely, the quantity surveyor who had prepared the bill of quantities. He failed to see any justification for such a contention. The plaintiff, he thought, had entirely complied with every obligation under the clause in sending the sealed copy, verified by an accountant, and he said that on the true construction of the agreement the defendants were not entitled to have the sealed copy verified by their architect or quantity surveyor, and, that being so, the defendants had been guilty of a breach of their contract with the plaintiff. He thought, therefore, the defendants were not justified in what they did, and the plaintiff was entitled to damages. These were reduced. The judge ordered the defendants to pay £1,000 for damages for breach, also the sum realised for sale of materials left on the site, and the cost of the action, the counterclaim being dismissed with costs.

It will be seen the question largely turned on the verification of the original estimate, and whether it was fair that the sealed and verified document should be furnished to the architect of the building. There are no doubt arguments on both sides. The district council wished to save expense, and if they had the priced estimate to consult they could manage by adjusting items to lessen the cost of any additions and alterations that were found necessary, these being based on the original prices. But these adjustments are usually made when the additions or alterations had to be paid for at the end of the contract, and a builder had a reasonable objection to show his prices to his employer or the architect before these variations were made. The architect or employer would sometimes be inclined to make use of this information for his client's advantage, in which case the practice would be unfair to the builder. In the present case the builder objected to the architect seeing his original estimate before deciding on what additions there should be. Prices are sometimes very high, or lump sums are put down by contractors that would bear reduction; in other cases, as all surveyors know, heavy amounts are affixed to items that are not understood. These excesses of pricing are convenient to make up for the deficiencies and omissions; hence the builder is averse to the architect knowing his prices. There is a natural reason, therefore, why the contractor should object to allowing the other side to see his pricing or his detailed estimates; why he objects to the quantity surveyor who prepared the bill and had an interest in the building seeing his prices, and so be able "to pick out the plums and leave the stones." The practice is certainly unusual, as Mr. John Holden, of Manchester, pointed out. On the abstract question of right and wrong, much may be said. Both the employers and the contractor acted justifiably in their own interests. Verification of estimates would be a good thing if conducted fairly on both sides; but, in speculative tendering, it is hardly possible not to see in which way it would be used. It would be a good thing if an architect or his surveyor went over the items and the prices attached to them before a tender was accepted, so that any discrepancies and anomalous pricing could be adjusted or put right; but after the contract was made this course would be open to misunderstanding. It might, for instance, be a temptation to the architect or surveyor to obtain an advantage over the builder. It would be unfair to the builder if the tender was a low one if variations from the contract had to be made at the same rates. These are points that suggest themselves to the mind, and it seems fair in speculative tendering that the contractor should, in case of additions or variations, be allowed a fair market price, instead of being too strictly held to those prices which he affixed for competing purposes.

HENDON PUBLIC OFFICES COMPETITION.

The Hendon Urban District Council have received eight sets of designs in a limited competition for their proposed municipal buildings, which are now on view at the public offices. These designs are still under consideration; but no selection or award has been made, so that we are in a position to fully comment on the whole number. The site is a spacious one, bounded in front by the Burroughs, on south by a new road, and on north by the Grove. The designs are numbered from 1 to 8; but we shall take the order in which they appear to us to have merit of plan, which is the primary consideration for the committee. The design No. 8 is perhaps the most compact in arrangement of the departments. It is quadrangular, with an open area and a large entrance-hall and central staircase, round which the main corridors and departments are grouped. A centre entrance with a semicircular portico of coupled columns leads into the main hall, in front of which is the principal stairs, with porter and telephone offices on either side. On the south, or left, side in front are placed the clerks' offices, which extend from the entrance to some little distance on the south side. The private office comes first, then the assistant clerks' room, with counter for inquiries from hall, and a third spare room, very compact and convenient; with a strong room between the private and clerks' offices, which slightly projects and forms a turreted feature on the elevation. The rooms are of good size, and close to the entrance. Next to the clerk's comes the rate-collector's large office, with space for public and a counter at one end, with two other rooms *en suite*. This range of side offices is approached by a corridor from hall. On the north side, in correspondence, we have in front the engineer's suite of offices, the clerks at the corner position, and the private room next hall, followed along the Grove-road side by a well-lighted drawing office, 34ft. by 24ft. 6in. The building inspector comes next, and in the rear are the cement-testing room and laboratory, a very good and workable arrangement, all entered from the north corridor. These two corridors running parallel inclose, as we have said, the stairs and open light area, and return also at the end, giving access to the medical officer's rooms. The caretaker's house forms a projecting block in range with collector's department. The author has, in his elevation, emphasised the central part of front between square turreted projections. On the first floor the council-chamber, 50ft. by 32ft., is placed centrally over entrance-hall, clerks' and engineer's offices; there is a raised gallery at one end for the public approached by a stair turret. The committee-rooms are on each side over clerks, and engineers' departments, with cloak-room and lavatory in rear. The refreshment room and library, 26ft. by 21ft., are placed over the rates office. Future extension is allowed for in rear round open area, and the block plan shows proposed public baths and library and fire-brigade offices on south side of site, and a public hall on north side. The elevations and sections are well drawn. The author has selected a rather too palatial-looking type of Italian Renaissance. The centre is relieved by coupled pilasters and a curved pediment, and flanked by the turreted projections terminated by cupolas. Stone or terracotta is largely used in the dressed parts. The council chamber is divided into three bays by pilasters, and the large cupola is carried up from the centre.

No. 1, in a Renaissance dress, with Late Gothic mullioned windows, is broken by a central ornate tower of elaborate outline and rather costly in detail. The ground plan has merit. On the left side of entrance are placed the rate-collector's office, with space for public, 40ft. by 20ft., and accountants' room, approached by a wide corridor which runs northwards to a future assembly-hall; the other, or south end, is poorly lighted. The principal stairs is central, opposite entrance. On the right side is the clerks' department, the private office and strong-room being at north end of corridor. The engineer's department on the rear side of it, with drawing office 37ft. 10in. by 24ft. 3in., is north-lighted by two windows. This part forms a projecting wing at back; on south side are the cloakroom and cement testing room, and the building inspector's room is at north-west corner behind the rate department, and approached by a side branch corridor from main corridor. The council chamber is 42ft. by 34ft., and is over drawing office, &c., forming a central projection in rear of main staircase, lighted on both sides, with semicircular benches—rather exposed to cross draught we are afraid. On left-side wing, approached from stairs, is the medical office and laboratory; the library and refreshment-room, 29ft. by 20ft., is on right wing, and the two committee-rooms placed lengthwise along the front with a reception or waiting-room between, arranged *en suite.* The plan is compact and convenient, and the offices occupy the main block in front. The caretaker is on second floor and at north-west corner.

No. 2 is also a well-considered scheme; the ground plan is rather straggling on the north side, and extends some distance northward, with the engineer's department placed at right angles to drawing-office, the latter with side north light. The long corridors to these offices are objectionable. The main block has the accountant's on left, and clerks' office on right-hand side of entrance, this portion being prominent; in the rear, and in line with the entrance, is a large hall and semicircular staircase, with wide corridors right and left to the engineer's and collector's department. The medical offices and laboratory form the left rear wing. The rate-collector's office, with its entrance, is well placed, and with good approach. The 1st floor plan is better planned. The council chamber occupies the centre part of front, 51ft. 6in. by 31ft. 4in., lengthwise to road, with committee-rooms on both sides the library over laboratory and in rear wing. The north wing is roofed low. In external treatment this design has much merit; the front elevation has the council chamber block, which projects beyond the wings, emphasised by a steep roof and central flèche. The three semicircular headed windows of council chamber have segmental pediments over, and those in the wings have also flat angular pediments, which break the cornice line and give some character to the front, which is official, but not pretentious. The materials are brick and stone.

No. 4 is a well-drawn set. The elevation, in a Late Classic style, is rather long and low, and there is hardly enough prominence given to the council-chamber, which occupies the centre on upper floor. The roof is on one level from end to end, but there are good details. The ground plan has a long back corridor parallel to front, which gives access to rate department on left and engineer's department on right hand. The medical department, laboratory, &c., are in the rear wing, and the building inspector, testing-room, &c., in the corresponding wing. The entrance-hall and stairs are not satisfactory. The future public hall is shown at the rear, in line with entrance. The council-chamber over the centre is square, with four isolated columns dividing transeptally the space. The clerks' department is over the engineer's, and on corresponding side of front the committee-room, next to chamber, the caretaker's behind.

No. 6, though roughly drawn, has a fairly workable plan, and the exterior design in simply treated Classic, has a French feeling in the high curved roof of centre; the windows have square-headed gauged arches, and the brick treatment is suitable. There is a centre entrance-hall and staircase with longitudinal corridors leading to clerk's offices on left fronting road, and rate-collector's in rear with lobby for public, and an entrance at end of corridor. The surveyor's department is on the right. The borrowed lighting of corridor through drawing-office at back of corridor is not good. On the upper floor the council chamber is in centre in front, with committee-rooms on both sides. There are some good points in this plan. A domical roof is shown over the council chamber. No. 5 is also plainly treated, but less characteristic of a set of public offices. The central block is roofed high, and has a cupola or turret, and side low-roofed wings. The narrow entrance from octagonal vestibule (7ft.) corridor, with doorways into collector's office or lobby space on one of the oblique sides, is not satisfactory. A narrow corridor on right leads to building inspector's office, with clerks' inquiry office behind, and engineers' department forming wing. The drawing office in rear wing is 41ft. by 22ft. On the left is the rate department from vestibule, and a committee room behind approached by a cross corridor. The council chamber, 54ft. by 34ft., is over the entrance and front offices, and the clerks' department is reached by a corridor on the right side over the engineers, also by a private lobby from council chamber. This is convenient; the committee rooms are in left wing, and the caretaker's rooms are behind staircase. The plan of corridors is not happy, and the front one would be rather dark. No. 3 is a poor plan, and the corridor narrow. The entrance and stairs are not in line. No. 7 has a wasteful and irregular plan; the hall is much too large and wasteful of space, with stairs on one side. The plan, too, is spoilt by the oblique position of drawing office to new road. The elevations exhibit elaborate detail, and there is a carved panel over entrance.

The proposed cost of the buildings is limited to £12,000, and we hear the Council have appointed Mr. Beresford Pite, F.R.I.B.A., as the assessor to decide as to the order of merit.

ESTIMATES.—XXXV.

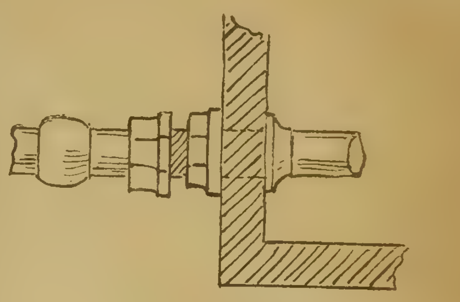
SANITARY FITTINGS—BRASSWORK.

PLUMBERS' fittings and brasswork comprise a large variety of articles, and can only be priced by referring to the price lists. These relate to lead bends and traps for sinks and closets, brass grates, and washers, brass connections, unions, ball-cocks and valves; stop-cocks of many kinds, water-waste preventers, baths and fittings, closet apparatus, &c. The cost of these items can be obtained by referring to the illustrated catalogue of some well-known maker or dealer, but the labour required in fixing soldering, &c., is not so easily found. For fixing such things as unions, traps, wastes, cocks, &c., the estimator ought to have some practical experience of the time it takes a plumber and his mate, the solder required, and other details. To take an item like the fixing of a trap for a sink or waste pipe;—to the cost of the fitting has to be added the labour, and the time in making one or two joints, the cost of solder, firing, &c. The estimates of plumbers differ very widely in these matters, so it is necessary for the valuer to analyse any important or often-occurring item to find out of what it is composed, and the time it takes a plumber and his mate in making joints, &c. The difference between cheap plumbing and the "best work" is remarkable, and may be estimated at as much as from 100 to 200 per cent. Thus, if the lead is of light weight, the supply and service pipes of "medium" weight, cast-iron painted soil and ventilating pipes, zinc ball-valves, light-gauge galvanised cisterns, and cheap fittings, it is possible to estimate for this quite 50 per cent. below work in which the lead is of proper weight, the service pipes of strong quality, drawn lead traps to waste, brass screws, gunmetal stop and "bib" cocks, galvanised-iron cisterns of strong gauge, and a good class of closets, &c. The prices we have affixed are in some cases rather high, and may fairly include profit.

We now give items of various sanitary and water-supply fittings, such as unions, bends, lead drawn traps, stop-cocks and valves, plugs and washers, and bath fittings, in the pricing of which we have to take into account the making of the requisite joints, the solder, and time of plumber and his mate. These are, in the necessity of the case, approximate values, and cannot with any accuracy be found in some cases.

The making of joints is an important item in estimating plumbers' work, and the student ought to make himself familiar with the connections required between lead and iron pipes, and those of stoneware, &c. The simple barrel union with one end cut with a male screw for iron pipe, and the other fitted with cap and lining for connecting to a lead pipe is an example. Two iron pipes can be joined together in a similar manner. The lining is connected to the lead pipe by a wiped soldered joint. The barrel coupling has a female screw cut inside, into which the screwed ends of pipe are attached, right and

1



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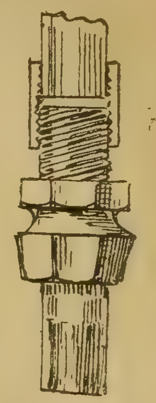

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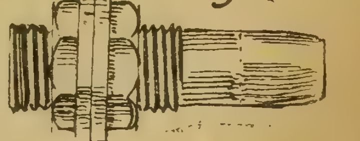

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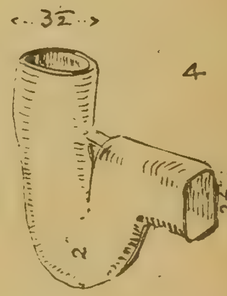

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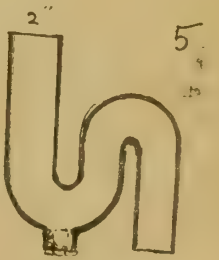

left-hand screws being cut in the ends of pipe. By this means the screwed ends of the pipes are attached to the barrel by means of a socket. The "boiler screw" joint or "union" used to connect the lead pipe to a cistern is another instance (see sketches 1 and 3). The joint to the cistern is secured by the fly-nut and a cap and lining; the latter is joined to the lead pipe by a wiped solder joint. A leather washer between ends of lining and screw secures a watertight joint. Other brass union couplings to connect with lead pipes are sold.

3ft. run. 2in. lead pipe ("middling").

A pipe of this quality weighs about 6lb. to the foot; it is probably intended for a waste pipe.

	£.	s.	d.
Cost of pipe	0	1	0
Labour fixing, say	0	0	8
	0	1	8

There is considerable difference in the cost given in price-books. Lockwood puts down for "middling" pipe of 2in. 2s. 4d., all labour and materials, including wall hooks; in Laxton, the price for a 2in. waste pipe is 11d.; but for cut lengths, an addition of 10 per cent. is made. For service-pipe of this size 1s. 8d. is quoted, and fixing 4½d. The joints to brasswork are included with the price of same. The outer end of waste would probably discharge over a gully.

5ft. run. 1½in. lead waste pipe.

	£	s.	d.
Cost of pipe per foot	0	0	9
Fixing ditto	0	0	6
	0	1	3

No. 2. Solder joints to 1½in. pipes.

Put for each of these, including solder, labour, and fire, 2s. 6d. each.

No. 1. Copper domical gratings on top of 2½ pipes.

These are worth about 1s. 6d. each fixed.

No. 3. 6lb. lead collars to ends of old soil-pipe and making joint to drain.

We have priced similar items before.

These collars are for the purpose of thickening pipes where it joins drain. If the collar is, say, 1ft. long, it would be about 1sq.ft. of 6lb. lead, say—

	£	s.	d.
6lb. of sheet lead	0	1	2
Plumber and labourer (one hour)	0	1	8
1lb. solder	0	0	8
	0	3	6

No. 4. 1½in. cast-lead siphon traps to lavatories and soldered joints (see sketch 4).

Cost of cast-lead siphon traps is about 2s. 6d. to 3s. Hellyer's patent cast-lead traps are about the latter price.

	£	s.	d.
Cost of trap, say	0	3	0
No. 2 1½in. solder joints	0	3	6
	0	6	6
10 per cent. profit	0	0	8
	0	7	2

No. 6. Hellyer's patent cast-lead anti-D traps of 8lb. lead and fixing to closets.

These are for closets. The items will be—

	£	s.	d.
Cost of trap	0	7	0
No. 2 joints, solder, and labour	0	5	6
	0	12	6
10 per cent. profit	0	1	3
Each	0	13	9

No. 4. Hellyer's 1¼in. cast-lead anti-D traps to lavatories, with screw caps.

These traps are proof against siphonage, which is so objectionable to round pipe traps. The space between bottom of trap and underside of dip is made smaller than the rest of the trap, by which a thorough cleansing action of the flush is insured. The depth of seal is about 1¾in. to 2in. They are made of pure lead without solder, and are perfectly smooth.

The price of this trap, 9lb. lead, is 2s., and with screw cap, 3s.

	£	s.	d.
Cost of trap	0	3	0
No. 2 1¼in. solder joints	0	3	3
	0	6	3

No. 4. 2in. cast lead traps and fixing.

These are worth 3s. 2d. each; if with screw caps, 4s. 3d., say—

	£	s.	d.
Cost of trap	0	4	0
Solder joints	0	3	9
	0	7	9

No. 1. Cast-lead bend, 16in. by 13in.

Cost about 5s. 6d. each, added to labour and solder joints, say 8s.

No. 4. 4in. lead siphon trap, 8lb. lead, and one soldered joint.

	£	s.	d.
Cost of trap	0	9	0
Labour, making joint, and solder	0	3	6
	0	12	6
Profit	0	1	3
	0	13	9

Making No. 3 soldered joints to 4in. pipe.

The soldered joint may be made up thus:—

	£	s.	d.
Solder, say 4lb.	0	2	8
Plumber and mate, say one hour	0	1	8
Firing	0	0	1
Each	0	4	5
Profit	0	0	6
	0	4	11

This is perhaps rather high, and for three joints 3s. 6d. each would be about fair.

No. 2. 1in. brass washer plug and chain, and soldering to lead sink.

	£	s.	d.
These are worth, this size, about	0	2	6
One solder joint	0	2	0
Chain and fixing, say	0	0	6
	0	5	0

No. 1. Ditto 1¼in.

Worth about 3s. 9d., and add 3s. for solder joint, chain, &c.

BATH FITTINGS, ETC.

No. 1. Extra strong combination bath fittings, with hot and cold valves and waste, nickel-plated, for ¾in. pipes.

These run from about 30s. to 38s. per set. (See list of plumbers' fittings. Nicholls and Clarke's catalogue shows bath combination fittings of this kind.)

No. 1. Ditto with hot and cold quick-turn valves, with ebony ball handles and pull-up waste brass plate for 1in. pipes.

These are quoted at 55s. brass and 65s. nickel-plated, and are of superior quality and finish. Brass bath fittings, hot and cold combined, for ¾in. pipes, can be had as low as 15s. 6d.; if plated, add another 4s. 6d.

No. 1. Brass 1½in. strong plug and washer, with bent union and fixing.

These are worth about 4s. 6d. Say—

	£	s.	d.
Cost of plug and washer	0	4	6
Soldered joint to lead pipe	0	2	6
Red lead	0	0	4
	0	7	4

No. 1. 1¼in. bath waste and trap with cleansing screw.

No. 2. 1¼in. bath overflows and fixing.

Price this at 2s. 6d. or 3s.

	£	s.	d.
Fixing, &c.	0	2	6
Unions, &c.	0	1	6
	0	4	0

No. 2. 1¼in. brass screw unions with fly nut and joint to lead pipe. (Sketch 1.)

	£	s.	d.
Say cost of union	0	2	6
Soldered joint	0	2	6
Red lead, &c.	0	0	4
	0	5	4

No. 1. Single nut boiler screw (strong) for 1½in. pipe and fixing. (See sketch 3.)

	£	s.	d.
These are priced at 2s. 4d.	0	2	4
Soldered joint	0	2	6
Red lead, &c.	0	0	4
	0	5	2

No. 1. Strong 2in. union joint and fixing to lead and iron. (See sketches 1 and 3.)

	£	s.	d.
Cost of union 2in.	0	8	6
Soldered joint	0	2	6
Red lead, &c.	0	0	4
	0	11	4

No. 2. 1¼in. bent ferrule screwed for iron at each end.

Cost about 4s. 9d. (See Nicholls and Clarke's list of plumbers' brass-work.)

STOP-COCKS, ETC.

Fix No. 1 extra strong 1¼ full-way screw-down gunmetal stop-cock outside building, packed with hair, felt, &c.

This is a very desirable safeguard in frosty weather, so that the supply can be cut off in case of necessity. The cost of an extra strong gunmetal stop-cock would be about 15s. to 20s.

	£	s.	d.
Cost of stop valve, say	0	16	0
Packing	0	2	0
Two joints	0	3	6
	1	1	6

A great variety of screw-down stop-valves adapted for lead, and for lead and iron pipes, are illustrated and priced in Nicholls and Clarke's catalogue.

No. 1. Garratt's strong patent screw-down 1in. stop-cock for house-main, with outlet for drainage pipe to prevent bursting by frost.

Put this down at 7s., exclusive of soldered joints and fixing at each end.

No. 3. Screw-down 1in. bib-valves (best quality) for high pressure.

These cost about 8s. each, and with joints, 12s.

No. 4. ¾in. ditto.

Cost about 4s. each.

No. 2. Boyle's patent air-pump ventilators on 3½in. pipe.

These are of different sizes and designs (see catalogue). A cheap form can be got for 5s. 6d. each.

CAST-IRON SOIL-PIPES, ETC.

60ft. of 4in. cast-iron soil and ventilating pipe, to weigh not less than 54lb. per 6ft. length, with all proper ears and fixing.

A pipe of this weight per 6ft. costs, according to Laxton, 3s. per yard, or 1s. per foot. This price includes connections. Say—

	£	s.	d.
Cast-iron pipe, per foot	0	1	0
Fixing per foot	0	0	3
Connections, say	0	0	2
	0	1	5

Iron bend and pedestal to base, also making good to drain, with brass ferrules well caulked, and according to regulations of L.C.C.

It would be difficult to put a price to such an item without knowing the length of bend. If it is an 18in. bend the cost would be about 6s.

	£	s.	d.
Cost of bend, say	0	5	0
Labour caulking two joints	0	3	6
	0	8	6

30ft. of 3½in. cast-iron soil-pipe, with large socket for caulking, with ears and making two connections.

A medium pipe of the L.C.C. regulation weight costs 1s. 9d. per yard, or 7d. per foot, including ears; if heavy, the cost would be 2s. 5d. per yard or about 10d. per foot.

If the connections require obtuse or square bends, or socket for closet trap, the cost would be for this diameter and, say, 15in. length of arm, 5s. 10d. Say—

	£	s.	d.
Cost of pipe per foot	0	0	10
No. 2 sockets at 5s. 10d. each, say per ft.	0	0	5
Labour	0	0	2
	0	1	5

No. 4. Loose ears for ditto.

These are fitted at 8d. per ear. The loose ear is separate and nailed to the wall, and has a dovetailed kind of slot through which the socket cast to the ear enters. This loose ear keeps the soil-pipe about 2½in. from the wall, thus allowing for cleansing or painting.

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THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE fortnightly meeting of the Royal Institute of British Architects was held at 9, Conduit-street, W., on Monday evening, the President, Mr. William Emerson, in the chair. Mr. Alexander Graham, hon. sec., announced the death of Mr. Stephen William Williams, F.S.A., of Rhyader, Radnorshire, who had been a Fellow since 1886.

THE ARCHITECT IN RELATION TO FIRE PREVENTION.

A paper on this subject was read by Mr. Thomas Blashill, late superintending architect to the London County Council. Fire-resisting construction has, said the author, been made prominent by the Institute from time to time, but it is difficult to keep pace with increasing needs. Buildings are more lofty and more crowded, and more closely packed with inflammable goods. Old residential buildings are turned into warehouses, the construction being actually altered for the worse. The Cripplegate fire was a case in point. Were it not for an efficient fire brigade we should recognise that fire risks are increasing in spite of Building Acts. There is no law to prevent this, or to require efficient protection of persons and property, and the architect must in many ways go beyond legal requirements. It is he who knows the risks and the proper remedies, and he cannot escape responsibility. The public is absolutely reckless of danger until some fatality occurs, then it looks out for a scapegoat. Four provincial theatres were burned during the last month. Fortunately no one was in the buildings at the time of the outbreak, for in one case at least the building was stuffed with scenery in a way one would not think to be now possible. In London within the past week lives have been lost by an ordinary shop fire. Means of prevention must be sought.

FIRE-RESISTING MATERIALS

are getting much more available, and they only should be used. They should be applied scientifically so as to minimise danger. We are much behind foreign countries in our regulations for public and private buildings as regards fire prevention. It is a hundred times more important to the present generation that old buildings should be fire-resisting than that new buildings should be so built. The power to compel this is very limited. The architect should get it done voluntarily. Fire and panic in places of worship are rare; therefore, provisions for safety have not been very much considered. The greatest catastrophes from fire, however, have occurred in churches, and there are plenty of narrow escapes even now. There are about

TEN FIRES IN THE METROPOLIS EVERY DAY

—not a large average, considering the number of buildings. Fire insurance discourages foresight and precaution. Hence come risk and loss of life, the latter too frequent, though happily not to any great extent at one time. The public appear absolutely indifferent, and laugh at precautions whether in places of assembly, workshops, or houses. This is not the view to be taken by the architect. He should be a diligent student on such matters, if not an expert. He should try to work with the municipal authorities, and not thwart them, or be content with fulfilling the bare letter of the law. All laws which affect one's temporary interests seem harsh. Parliament will never pass building laws which go as far as students or experts think to be necessary, nor even so far as the skilled and prudent architect may consider it advisable to carry out in his work. In all our recent dealings with places of public amusement and factories an enormous amount of improvement has been effected by the public voluntarily. When such is the case, the law can gradually be strengthened so as gradually to bring unwilling persons into line.

THE ARCHITECT CAN DO MUCH MORE

than he may expect to persuade and convince his client that good building is cheap building in the end. The rebuilding of the Cripplegate area is a striking instance of what may be done in individual cases by the action of the architects to lessees and landlords. We may hope to raise the general standard of practice to such a level as the Institute feels to be necessary.

MR. CATES ON FIRE-RESISTING ROOFS.

The Secretary read a letter from Mr. Arthur Cates, chairman of the Tribunal of Appeal under the London Builing Act, in which he said that, had he been able to be present, he would have endeavoured to emphasise in the most forcible manner "the lesson of West Ham," where an admirably-equipped polytechnic institute—recently erected and furnished at a great cost—had been wrecked and much loss incurred, apparently because the very able and clever architects, possibly for economy, or merely following the ordinary routine, had been content to construct the roofs in the ordinary manner, without taking any fire-resisting precautions. This lesson, one only, but the latest of a long series, should be taken to heart by all architects, and by all those who may have the control of similar buildings, private houses, and mansions, so that precautions may be taken by modifying the existing dangerous construction, and securing that no like error should be again committed. "For something like thirty years past," continued Mr. Cates, "I have been endeavouring to advance fire-resisting construction by imposing, as far as possible, conditions requiring it in any important buildings which I might be able to influence or control. As experience has progressed and suitable materials became better known and more available, these conditions ultimately assumed the form that 'All floors, partitions, and roofs should be fire-resisting, and all iron and steel construction, columns, stanchions, and girders should be effectually protected by fire-resisting material.' As regards the construction of roofs and protection of ironwork, I have sometimes found considerable difficulty in obtaining even partial compliance, the conditions being declared by architects of position to be beyond the requirements of the Building Act—vexatious and needless; but experience has fully proved their importance and value. The provisions of the Building Act as to roofs—that they should be covered with slate, tiles, metal, or other incombustible material—has probably led to the idea that this was sufficient protection; but this legislation is only the minimum, and solely intended to prevent the use of such coverings as tarred boarding or the like. The Act of 1894, in section 62, providing that any story constructed in the roof at a height of above 60ft. from the street level, should be of fire-resisting materials throughout, has been a slight advance in the right direction; but if the condition stated of a story in the roof does not exist, it would seem that the enactment has no effect, and the roofs may be constructed in the ordinary combustible manner. However, whether there is legislation or not, it is clearly incumbent on the architects of all buildings of any importance, public or private, to so construct the roofs as to prevent the occurrence of catastrophes. More than fifty years ago, I was engaged on the drawings of an addition to an old warehouse. The new work was carried out in the most scientific method of that day, as absolutely fireproof—with cast-iron columns and girders with brick arches—and we were very proud of it. Soon after the building had been completed and occupied and filled with goods, a great fire broke out in it, with the result that our fine new scientific structure practically disappeared in a heap of rubbish, while the old warehouse, with its great timber posts and beams and thick well-tongued floors, escaped with comparatively little damage. Instances of this kind may be repeated over and over again, but they cannot affect public buildings and private mansions, which are not stored with masses of combustible matter; nor can they absolve the architect in these days from the responsibility of making the roof of his building, as far as possible, fire-resisting, protecting the iron construction from fire-action, and taking all precautions to preclude the possibility of the rapid spread of fire. So far as could be seen from the outside, the roof of a quasi-public building recently erected, in which a valuable library will be housed, has been constructed in the ordinary manner of fir rafters and boardings, without any provision for protection from fire, while the greatest care has been taken to render the floor fire-resisting; and in one of the prominent West End streets a very handsome stone-fronted shop building just finished is carried by iron or steel stanchions on the ground floor, all exposed and unprotected. I venture to suggest that those who have the charge of the great buildings containing our national treasures of nature and of art should see that effective measures are promptly taken to place any such roof as may require it—should there be any—in a reasonable condition of fire-resistance. It would be a great public satisfaction if an assurance could be give that the roofs of the new building of the Victoria and Albert Museum, South Kensington, the Royal College of Science, the new Public Offices, &c., will be so constructed as to be perfectly fire-resisting. Great confidence is placed in having plenty of fire hydrants in and about a building. Too often the hose is neatly coiled as the centre feature of a fire arrangement, surrounded by the branch and other implements, and inclosed in a handsome glass case, like valuable objects in a museum. Thus, if required for use, the coupling up of hose to hydrant and branch to hose is necessitated, operations which to inexperienced and untrained hands are not very easy, and in any case may lead to serious delay and confusion, which would be avoided by the hose and branch being kept coupled up to the hydrant ready for immediate use. But 'prevention is better than cure,' and however complete the fire hydrant service may be, it does not in one atom diminish the necessity for the construction of the roof being fire-resisting. The severe test experiments conducted by the British Fire Prevention Committee are affording means for judging of the comparative fire-resistance of various materials, and collecting information of great value, which should much assist architects in the selection of such materials as may be most likely to minimise the spread of fire. There are many other important matters which might be dealt with, such as the avoidance of continuous hollow spaces under floor surfaces and in partitions, at the back of skirtings, dadoes, and wall linings, the external protection of window openings in light areas and narrow streets, the prohibition of composition tubing for gas services, the regulation of swing burners to avoid contact with combustible material, &c., while not the least source of danger is the present mania of the shopkeeper to have his shop-front all plate glass undivided by piers, with grand stone façades above the ground floor resting on iron construction, so arranged that no apparent support is visible—this, and the extension of shops over the forecourts of suburban houses, including many in one establishment, would seem to need some legislative action to control."

DISCUSSION.

Mr. D. Waterlow, chairman of the Building Act Committee, L.C.C., in proposing a vote of thanks to Mr. Blashill, remarked that his committee might be considered a *bête noir* by architects, as it had a difficult task to perform, and one hemmed in by many complexities. The difficulties resulted from the fact that the London Building Act of 1894 contained both fixed and permissive regulations. The matters relating to fire prevention came not only under that Act, but were also affected by the provisions of the Factory and Local Management Acts. The Committee sought, in carrying out these measures, simply and frankly to direct their attention to the saving of life, the question of cost not being considered where the public safety was concerned. In theatres the aim should be to preclude risk from panic rather than fire, and to recognise that smoke was a far more fatal agency than flame. The provision of sufficient wide and directly approached exits for audiences was therefore more important than the prevention of the spread of fire. The work of the County Council had been much criticised in regard to factories, and the objection to these regulations was chiefly raised because there had been few serious accidents in such premises in London. In many of the old factories there still was absolutely no attempt to protect the lives of the workers. Many buildings in which numbers of easily-frightened women and girls were employed were three or four stories high, only one open-step ladder communicating from floor to floor. Under the present regulations, one good fireproof staircase and some one alternative exit had to be provided. Under the Factory Acts, the committee had no power to interfere in this direction, unless more than forty people were employed above the ground floor, and there were many cases where the number of hands was deliberately reduced to forty, so as to evade the requirements for safety. The Committee were now insisting on the provision of adequate means of escape from hotel flats and other lofty buildings. Under the present London Building Act they could only deal with new buildings; but it was a question, in his mind, whether the Council ought not to seek to obtain further powers in this direction.

Sir John Taylor, K.C.B., in seconding the vote of thanks, expressed great sympathy with Mr. Blashill in his objects; his remarks had been of the most practical kind, and most of them he heartily endorsed. The earliest example of fireproof construction for a public building within his knowledge was the National Gallery, where Wilkins carried his floors on earthenware pots. Wilkins was thus far ahead of his times, and the idea was an excellent one, although pot-construction had long since given place to bricks and concrete as fire-resisting materials. There were obviously great practical difficulties in providing fireproof construction in public buildings. To be complete, the floors needed to be laid directly on the concrete, sealing it in; but numerous pipes for gas, water, electric and telephone wires had to be laid into each room, and to lay them above the floor behind casing was not always sightly. So far as our public buildings were concerned wooden roofs had been abandoned. The roof of the New Record Office was absolutely fireproof; it was of iron, covered with iron plates, and the ceiling beneath it was also fire-resisting. The roof of the new Admiralty Buildings was also fireproof. He could answer for it that the architects of the three proposed new Government buildings—the Public Offices, the War Office, and the Victoria and Albert Museum—Mr. J. M. Brydon, Mr. William Young, and Mr. Aston Webb, were fully alive to the importance of rendering those edifices, and especially the roofs, fire-resisting. Some allusion had been made to safety being paramount to cost. This, theoretically, was quite correct, but practically the difficulty was to get the money to carry out the work efficiently, and this applied not only to building owners but to Government Departments. When he was being examined by a Parliamentary committee as to the plans and estimates for the new Admiralty Offices, he expressed the opinion that to obtain sound and fire-resisting construction would cost nearly 1s. 2d. per cube foot. At this an ex-Cabinet Minister opened his eyes very wide, and said he could show him a large building, not far away, which cost only 7d. a foot. He replied he feared the public would object to a plain stock-brick structure in St. James's Park, even if it could be done at 7d. a foot, and it afterwards transpired that the member referred to some buildings used as offices by a railway company. He could only say that no efforts would be wanting on his part to see that good sound construction was provided in the important public buildings about to be erected.

Mr. William E. Riley, Superintending Architect, L.C.C., supported the vote of thanks, observing that it dealt in a broad, practical, and very interesting manner with a subject which concerned every member of the profession. Incidentally, he wished to say a word as to the way in which the Metropolitan district surveyors discharge their onerous duties; they performed their work with much tact and delicacy, and, though unpopular and much abused, were men of high integrity. The intention of the L.C.C. regulations as to theatres was solely the protection of the public. So long as ample means of escape was provided from the auditorium, the manager might, if he chose, allow the stage portion to be destroyed. He could endorse and emphasise Mr. Waterlow's views as to the great danger of smoke; the fatalities in a theatre fire were due, not to the flames, but to asphyxiation and crushing, resulting from fumes and panic respectively. He had just received from New York the new building code for the enlarged municipality, which came into operation on Tuesday last. This code dealt, for example, with all "public buildings," a wide term, comprising restaurants, hotels, lodging-houses, &c., without restriction as to area, provided they exceeded 35ft. in height, and it stipulated that these were to be of fireproof construction; while every building of any kind over 75ft. in height must be of fireproof materials. Every theatre had to face one main thoroughfare and one side street; or, if a "closed site" were built upon, side passages must be provided, ranging from 7ft. to 10ft. in width, according to the size of the house. In place of a staircase, a slope of not more than 1 in 12 of fireproof construction had to be provided; this was an important point in theatre construction, and one which would severely test an architect's powers of planning. Another regulation prohibited any connection between a house of entertainment and any hotel, lodging-house, or factory, which, if copied here, would abolish the familiar assembly-rooms and music-halls attached to public-houses. Further, the "flies" of a theatre would have, in New York, to be constructed of fireproof materials, and provided with proper means of exit. He found, on looking into various building regulations at home and abroad, that in Italy, Lower Austria, Russia, and Belgium, theatres could only be built on isolated sites, whereas there was no such restriction either in London or Paris. He referred, in conclusion, to the lessons suggested by the sudden burning of the Hotel Windsor at New York in March last.

Mr. A. E. Sachs, Chairman of the British Fire Prevention Committee, commended the high tone of the lecturer, the subject being treated on broad lines, and every detail of special manufacture being avoided. He could emphasise Mr. Blashill's argument that the requirements of the London Building Act represented the minimum that an architect should observe. The knotty point was how the legislature could apply provisions for fire prevention to an old building, and this would not be arrived at until building owners had been educated to regard protection from fire as quite as important as they had been led to consider of late years healthy drainage. In theatre planning he should place good exits before fire-resisting construction. If they could get the people out by a straight exit without complexities, the duty of the public authority was at an end; it was the concern of the proprietor whether he chose to let his building burn down, or insured, by good construction, against fire. From personal inspection he could say that nine out of ten hotels in London would be death-traps if fire occurred during the night. It was high time that something was done to render them safe.

Mr. H. H. Statham urged the importance of securing symmetrical sites for theatres, with entrances in the centre of each side; where the main entrance was placed at the corner, people in leaving naturally all made for that point, disregarding the minor exits.

Mr. C. Forster Hayward, F.S.A., alluded to the carelessness of builders' and plumbers' practices in repairing operations and alterations as being frequently the causes of the destruction of old houses. Architects did well to take special precautions to guard against these risks during repairs.

The President, in putting the vote of thanks, said it was strange architects did not more clearly realise the moral responsibility which would rest upon them should a fire occur in buildings where they had yielded to the clients' desire to spend as little as possible on fire prevention. He had been pleased to hear sufficiency of exits declared to be more important than fire-resisting materials.

Mr. Blashill, in replying to the vote of thanks, which was carried by acclamation, said he had always regarded the Building Act requirements as the minimum of sound construction. He had pointed out to building owners who wished to evade it: Here is a line drawn—if you overstep it you will go to Bow-street, and a wise man will keep well within it for safety's sake.

* * *

In the action brought by the Duke of Westminster, Custos Rotulorum of the county of London, against the Duke of Bedford, Custos Rotulorum of the county of Middlesex, with reference to the records of the county of Middlesex, judgment was given on Monday for the Duke of Bedford. The Duke of Westminster sought a declaration that the Middlesex records which related to London belonged to the county of London on its creation by the Act of 1888.

THE ARCHITECTURAL ASSOCIATION.

THE fortnightly meeting of the Architectural Association was held on Friday evening at 9, Conduit-street, W., the President, Mr. G. H. Fellowes Prynne, F.R.I.B.A., in the chair. Messrs. H. B. Smith and J. S. Blunt were elected as members.

THE STREETS AND BUILDINGS OF OLD LONDON.

Under this title an interesting lecture was given by Mr. Andrew Oliver, A.R.I.B.A. The address was illustrated by a large-scale map, a great number of drawings and engravings, and many lantern-views of unusual excellence.

The streets of London, full of interest and of information as they are, would, said the lecturer, be entirely lacking these qualities were it not for the histories which have gathered round the buildings which it formerly possessed. The history of a city is built up by its buildings and the inhabitants who have occupied them; but it is chiefly in the edifices of the past that we are enabled to discover the monumental history of its past. We have a few scanty remains of the Roman period, and a few of the ruined and desolated monasteries, and of the early churches, which were to be found here, and we can also, in the names of its streets, trace the gradual changes which certain neighbourhoods have undergone, but even the few remains we have of a past period are getting less and less every year, until at length the only records that will be accessible will be found amongst the drawings of the antiquary and the pages of the historian. One has to read the work of John Stow to realise what we have lost in the way of ancient architecture; but few buildings given by him are now in existence. The destruction of these historical documents has been so complete that when one reads the account of London in the days of Henry VIII. it seems like a fairy tale.

WALLS AND GATES.

The oldest remains we have in the City are portions of the old wall by which it was encircled from very early times. The course taken by the wall is as follows:—Starting from the Tower, it went up to Aldgate and on to Bishopsgate, skirting Houndsditch, then to the churchyard of St. Giles, Cripplegate, where there is to be seen the remains of an old postern to Aldersgate. It then took a sudden turn until it came to Newgate, when it made its way straight down to the river, ending at what was afterwards Baynard's Castle, or near there. Baynard's Castle was known as the Castle of London, and the governor was styled Constable of the Castle of London to distinguish him from the Constable of the Tower. It is possible that it went along by the river, but few, if any, remains have been found. Inserted in the south wall of St. Swithin's Church, Cannon-street, is to be seen London Stone. From this point the Roman roads were measured. In looking through the City records, there are several items of interest in connection with the old gates. The great gates were fastened at the beginning of the curfew at St. Martin's-le-Grand, and the wickets were to be closed at the last stroke, and not opened that night unless ordered by the mayor or alderman. Edward II. ordered, after the bell had been rung at St. Thomas Acons, the wickets were to be opened (about 6 a.m.), and the great gates at sunrise. A guard was also kept at each gate, consisting of eight to twelve men, under the alderman of the ward. Tolls were levied on all carts having goods to be sold entering or leaving the City, except in the case of private individuals or goods for household use. The gate-porters were not to allow lepers to enter the City. The gates and tourelles were let on lease to various persons. Geoffrey Chaucer held Aldgate in 1374. The Bishop of London always provided the hinges of Bishopsgate, taking as toll one stick from every load brought in. William Kingscote, keeper of Ludgate, was suspended for throwing stones from the top of the tower, so that neither the sheriffs nor their officers could enter.

MONASTIC BUILDINGS.

Amongst the buildings of Old London none were of more importance than the great monastic establishments. Sir W. Besant says:—"Within and without the City walls there stood fifteen great monasteries whose splendour only can be understood by the ruins of Tintern, Glastonbury, Fountains, and Rievaulx." Their reign came to an end at their suppression in the time of Henry VIII. and Edward VI. They may be arranged under the heads of monastic and conventual buildings, colleges, hospitals. The buildings which still possess some remains of an early period are as follows :—St. Bartholomew, Smithfield, the Charterhouse, the Temple, Austin Friars, St. Helen's, Bishopsgate ; St. Mary Overie, the Greyfriars (now Christ Hospital), gateway of St. John's, Clerkenwell. Those destroyed consist of the following :—St. Martin's-le-Grand (now the Post Office), the Hospital of St. Mary of Bethlehem (now occupied by Liverpool-street Station), Priory and Hospital of St. Mary, the Preceptory of the Knights Templars, Holborn ; the Minorites, or Nuns of St. Clare (now the Minories) ; Crutched Friars, St. Katharine's Hospital ; site now occupied by St. Katharine Docks ; the tombs and fittings moved to St. Catharine's Hospital, Regent's Park. The Abbey of St. Mary of Grace, of Eastminster, now the site of the Mint. The Priory of Holy Trinity, Aldgate. The two houses of the Black Friars ; one formerly on the site of Old-square, Lincoln's Inn, the other at Blackfriars, now the *Times* office. The Monastery of the White Friars adjoins the Temple.

COLLEGES.

St. Nicholas Brotherhood, Camomile-street ; St. Thomas of Acons, on the site of the Chapel of the Mercers' Company, the birthplace of Thomas à Becket ; Whittington's College, Paternoster Royal ; Jesus Commons, near Dowgate ; St. James's, Chapel-on-the-Wall, Cripplegate ; Holmes's College and Lancaster College, both attached to St. Paul's ; Leadenhall College, in the chapel of Leadenhall ; Pountney College, St. Laurence Pountney ; St. Michael College, St. Michael, Crooked-lane. The College of St. Mary Magdalene and All Saints, Guildhall.

HOSPITALS.

St. Bartholomew, Smithfield ; St. Thomas, founded in Southwark, 1313, near to St. Mary Overie, purchased at the suppression by the City ; St. Giles, Cripplegate ; the Lazar House, Southwark ; St. Anthony, Threadneedle-street.

ST. PAUL'S CATHEDRAL.

Old St. Paul's was surrounded by a wall which possessed six gates. They were the Littlegate, Cheapside, St. Augustine, Paul's Alley, Canon Alley, and Paul's Chain, so called from the great chain which was drawn across. The road went along what is now Carter-lane, where stood the brewery and the bakery. It then went up Creed-lane, and so to Paternoster-row. The "Jesus Tower" was near to St. Augustine's Church, at the east end. St. Paul's was about 690ft. in length by 130ft. at its greatest width. It possessed the unusual feature of a north and south cloister. Remains of the latter, and also of the Chapter-house, are to be seen on the south side. The Pardon Church-haugh, built by Gilbert à Becket, stood on the north, where also stood the Charnel House, which was taken down by the Lord Protector Somerset. At the west end there was a Galilee porch and the Church of St. Gabriel, and in the crypt, at the east end, a church dedicated to St. Faith.

CHURCHES.

These may be grouped under two heads—those churches which were erected before the Great Fire, and those subsequently. Of the first division we have left : All Hallows Barking ; St. Andrew Undershaft ; St. Bartholomew, Smithfield ; St. Ethelburga, Bishopsgate ; St. Giles, Cripplegate ; St. Helen's, Bishopsgate ; St. Katherine Cree ; St. Olave, Hart-street. There were three others before the fire, and not destroyed then, but they have been pulled down in later times : All Hallows Staining ; St. James's, Duke's-place, Aldgate ; St. Martin Outwiche. As regards the second division, they may be classified as those which were built by Sir Christopher Wren, and those which have been erected by others. In the Harley MSS., 4,941, British Museum, will be found three schemes for the rebuilding of the destroyed churches. The original number proposed was 39, and the document, which authorises this number, is signed by the Primate at the time "Gilb. Cantuar." In all there were 62 rebuilt —viz., 50 under the supervision of Wren and the remainder by other architects. The loss by the Fire may be briefly stated : Churches not rebuilt, 35 ; rebuilt by Wren and others, 62 ; total, 97. It is much to be regretted that so many of these monuments of the past have been destroyed, and the destruction is going on. Only on December 6 of the present year were the fittings of St. Michael Bassishaw sold preparatory to the destruction of the church, and in the *City Press* of December 13 the possible destruction of St. Ethelburga, Bishopsgate, is mentioned. Two churches have been re-erected. St. Mildred, Poultry, is now the private chapel at Thorpe Hall, South Lincolnshire, and St. Bartholomew-the-Exchange, it is said, is about to be removed a second time from Moor-lane, Finsbury, and rebuilt elsewhere.

CHEAPSIDE.

In looking through the old chronicles, we find a different state of affairs to what is in vogue at the present day. For instance, we read that in Cheapside in the year 1273 seventeen candle-makers were expelled by the irate citizens. Bonfires of false goods took place occasionally. In 1311 at the request of the hatters search was made for bad and cheating hats, with the result that forty grey hats and fifteen black hats were publicly burnt. In 1340 the furriers and fishmongers had a riot, and a fishmonger tried to cut off the Lord Mayor's head, and he was nearly hanged for it. The pillory was also set up, and a fishmonger was put in there for selling bad fish, "and the said fish was burnt under his rascally nose." Opposite Wood-street stood Cheapside Cross, erected by Edward III., and pulled down by the Commonwealth in 1643. Bow Church, rebuilt after the Great Fire, has still in existence its Early Norman arched crypt, from which it is said to take its name, "St. Maria in Arcubus."

PUBLIC BUILDINGS : THE ROYAL EXCHANGE.

The present is the third building which has been erected. The first was commenced in the year 1566 and opened by Queen Elizabeth in 1570. It was, however, a great nuisance. We find in 1590 certain women were prosecuted for selling oranges and amusing themselves, and cursing and swearing at every one. Two years later, a tavern keeper was fined for allowing tippling, and for broiling herrings, sprats, and bacon to the vexation of the worshipful merchants. In 1662 complaint was made of the rat-catchers and dog-sellers, and bear-wards would parade before the Exchange with a monkey on the bear's back. Gresham's Exchange was burnt in the Fire, and a new one erected by Sir Christopher Wren. In the rebuilding of London it was Wren's idea to make it the central point of the City, from which broad avenues proceded, but unfortunately it was never carried out. This Exchange was burnt down in 1838. The present one was opened in 1842. The church of St. Peter, Benetfink, was pulled down when the present Exchange was built.

THE BANK.

If one were asked what portion of the City has been most altered, the answer would probably be that by the Bank of England and the Mansion House, in the heart of the City. There is not a place more changed, or which has been more changed, or which has been more altered, than this. The Bank of England, for the most part, stands upon the site of the house of Sir John Houblon, who sold his property to the Bank for a site. It consisted of a house, with a frontage of about 80ft., and runs back about 250ft., and a garden. In front there were two small shops or stables. At that period Princes-street, as we now know it, had no existence, there being but a main court, 20ft. wide, which came out opposite to the church of St. Margaret's, Lothbury. Next to the Bank, as first built, there were two churches and a vast network of houses. Close to the Bank stood the site of the Hospital of St. Anthony. This was a cell to the House of St. Anthony of Vienna. Pigs were given over to the hospital as alms. In 1311 we read that the Renter of the House of St. Anthony was sworn that henceforth he would claim no swine found wandering about the streets of the City as being arms, and that he would put no bells on them, or on those of any other person, nor would allow any such bells to be put on other than those which should be given. The saying at the time was "As fat as St. Anthony's pigs." Three swine killers were appointed to kill all pigs found in the streets : they could be redeemed at 4d. each. If not claimed, they were forfeited, and sold to repair the gates.

THE STOCKS MARKET.

Stow says : "In the year 1282 Henry Wallis, mayor, caused divers houses in the Citie to be builded towards the maintenance of London Bridge, namely, in one void place near unto the parish church, called Wool-church, where some time had stood a paire of stocks. The building took name of Moore Stocks, and was appointed by him to be a market place for fish and flesh in the midst of the City. In the year 1322 certain markets were appointed. The stocks were let to farm at £46 13s. yearly rental. In the year 1507 the rental was £56 19s., and in the year 1543, John Cates being mayor, there were eighteen stalls for fishmongers, rented yearly £4 13s. The butchers had also eighteen stalls, rental of £41 16s. 4d., and chambers above rented at £5 13s. 4d." The present Mansion House was erected on the site of the Stocks Market. Pennant tells us that "in the market stood a statue of Charles II., given by his most loyal subject, Sir Robert Viner, Lord Mayor, which his lordship discovered made at Leghorn. The statue represented John Sobieski trampling on a Turk. The Polish monarch was christened Charles, and the turbaned Turk, Oliver Cromwell." Horace Walpole says it was unfinished, and a new head was added. The statue remained some time amongst the rubbish of the destroyed market and was given to Mr. Robert Vyner, a descendant of the Lord Mayor. On the demolition of the Stocks Market, it was decided by the City to arch over that portion of Farringdon ditch which lies between Fleet-street and Holborn. It was opened 1737. Fleet Market lasted until 1829, when it was taken down to form Farringdon-street, and Farringdon Market took its place, opened in the year 1826. The west side of the market was taken down when the Viaduct was constructed, about 1869.

THE GUILDHALL.

The first Guildhall was built in the year 1411 by Thomas Knoles, then Mayor. In the first year of Henry IV. the executors of Sir Richard Whittington gave £20 towards the paving, and in the next £20 more. In every window were placed the arms of Whittington. Sir John Shaa kept the first feast there about 1501.

THE GUILDHALL CHAPEL.

This building was in existence until 1822. It was founded in 1299, with an establishment of warden, seven priests, three clerks, and four choristers. The chapel was given to the City by Edward IV. at the dissolution of the college. The following account of the chapel is taken from Stow :—"The chapel or colledge of our Lady Mary Magdalen and All Saints by the Guildhall, called London College ; the same was built about the year 1299, and that Peter Fanelove, Adam Francis, and Henry Frowyck, Citizens, gave one Messuage with Appurtenances In the Parish of St. Foster to William Brampton, custos of the Chauntry by them founded in the said Chappell, and . . . the other house in the Parish of St. Giles Cripplegate, in the 27th of Edward III., was given to them. Richard II. granted license to Stephen Spilman to give one messuage, 3 Shops with the Appurtenances in the Parish of St. Andrew, Holborn. King Henry VI., in the 8th of his reign, gave license to the Custos to build of new the said Chappell or Colledge of Guildhall, and in the 27th year of his reign granted to the Parish Clerks in London a Guild of St. Nicholas for two Chaplaincies. The value of the Colledge was £12 8s. 9d. The Library, which was situated on the south side, was built by the executors of Sir Richard Whittington and William Bury. The arms of the former were on one side, and the initials WB on the other. The Books which belonged to the Library were plundered by the Protector Somerset."

BLACKWELL HALL.

Next to Guildhall Chapel stood Blackwell, Bakewell, or Bassinghall. In 1396-7 Richard II., in consideration of the sum of £50, granted license to John Froxle, William Parker, and Stephen Spilman, citizens and mercers, that they might assign unto the mayor and commonalty for ever for the common benefit the said messuage, called Bakewell Hall, &c. From this period it became established as a weekly-place for woollen cloths, both broad and narrow, which were brought from all parts of the kingdom to be sold. An ordinance was passed in 1397-8 under the mayoralty of Richard Whittington, and another in the year following, under the mayoralty of Drew Barringtine, declaring that no foreigner or stranger should sell any woollen cloth but in the Bakewell Hall, upon the penalty of the forfeiture thereof. This was confirmed again in 1517. No manner of person being freeman of the City should suffer any person whatever, be he free or foreign, to buy or sell any manner of woollen cloth harboured or lodged contrary to the said ordinance, or any other manner of cloth made of wool, within his shop unless the said cloth was first brought to Blackwell Hall. Having stood for about 400 years, it became ruinous about the middle of the 16th century, and it was pulled down and a new building erected in the year 1558, at a cost of £2,000. Blackwell Hall appears to have been erected about 1672. The attic was ornamented with cornice and pediment. This structure was taken down in 1819.

Mr. A. W. Hennings, in proposing a vote of thanks to Mr. Oliver, remarked that to prepare such an address involved much laborious hunting in museums and libraries, and great powers of condensation to compass it into an evening's paper. There was a good deal still left of Old London for those who would take the trouble to look for it, but the fragments were rapidly disappearing. In Ely-place, Holborn, recently, when a house near the beautiful former chapel of the Bishops of Ely was being pulled down, the workmen discovered some fragments of the episcopal palace, and also the chalk brought as foundations and remains of a wooden footbridge. Twenty years ago, in Hart-street, Wood-street, remains of a beautiful Norman apse were found, but were hastily removed to allow of reconstruction. On account of the very heavy ground-rents in the City, and the small interest taken in antiquities, it was not to be wondered at that architects and their clients did not preserve mediæval remains when found during demolitions.

Mr. F. G. F. Hooper seconded the vote of thanks, stating that such lectures as the admirable one to which they had listened tended to increase the interest of the profession in Older London, and so indirectly towards the preservation of any fragments found. Such an address threw also much light on the meaning of the names of familiar localities and the historical accounts of our streets and buildings.

Mr. C. H. Brodie and Mr. C. J. Williams also joined in the discussion, the latter pointing out that three centuries ago the City was far more beautiful and picturesque than it now was. Mr. Matt Garbutt, on the other hand, doubted whether the veil of smoke and fog which now overhung the City did not add very much to the picturesqueness of effect, and although the details might not be satisfactory, the general grouping and masses of building were far more effective than at any earlier period, while the sanitary conditions was undoubtedly very greatly improved.

Mr. M. J. Dawson followed on the same lines, and the President, in summing up, referred to the immense value possessed by the large scale map drawn by Mr. Oliver, on which was shown the former monasteries, collegiate and parochial churches of the markets and highways of London before the Great Fire, now almost completely obliterated. With all the changes effected, London was still a very picturesque city, and he had been struck by the remark of a foreign friend when they were crossing Waterloo Bridge one morning and looking at the prospect of St. Paul's and the City towers rising above the mist to the height, and the scarcely less attractive view of Westminster to the left, that the English did not half appreciate the beauties of the capital. While the present building regulations and restrictions precluded London from being as freely picturesque as in Mediæval days, they had gained much in exemption from fire and in health, and under an everlasting fog even such structures as the Tower Bridge loomed out grandly. The Association was doing something to interest Londoners in their city, and a committee was preparing a small pamphlet, in which an endeavour would be made to point out the leading characteristics and historical associations of its buildings, both ancient and modern, dealing with the Metropolis in various sections—a selection would be invidious as well as laborious; but he believed the outcome of the effort would be of great utility.

Mr. Oliver briefly acknowledged the vote of thanks, which was carried by acclamation.

FIREPROOF BUILDINGS AND PARTITIONS.

We have received a new catalogue from the Fireproof Partition Syndicate, Limited, 10, York Buildings, Charing Cross. The Cunnah-Wright patents, which are illustrated, are well known to many of our readers as a wonderfully simple and ingenious system of constructing dwelling-houses, warehouses, partition walls, and floors of every description. The Cunnah-Wright sheet, which is formed out of ordinary iron, or steel sheet, forms a patent double dovetail corrugation, possessing enormous rigidity and strength, and at the same time a capital "key" for any plastic material. We all know what the ordinary curvilinear corrugation will do for iron sheets; but in this particular patent the corrugations are infinitely stronger, and resist the crushing and tensile forces in a far more effective manner, as the dovetail corrugation forms a large sectional area of the metal. With these sheets a large variety of purposes in building can be carried out. We have, in a photo.-illustration, a view of the British Pavilion for the Paris Exhibition, in which Cunnah-Wright's patent is used for the outside walls. The sheets are shown fixed between the small flanges of H-iron standards. For this purpose nothing can be stronger and more economical; the walls can be rapidly built, and of two or more stories, the corrugated sheets being fixed at top and bottom into a T-iron head, and into a channel iron at the sill which is wide enough to take the H-iron standards. Into this steel framework the sheets are fitted, and fixed between flanges by cement. Girders, columns, and stanchions can be cased with shallow sheets of the same section, several illustrations showing the application for this purpose. For floors the sheets can be placed on the lower flanges of the steel joists, filling up to the level of top flanges with concrete. The underside forms a good key for the plaster of ceiling. Round iron columns or stanchions the sheet can be bent and cemented inside and outside. For these purposes we believe the Cunnah - Wright system is admirably adapted. It can be bent or curved to any shape, and the space it occupies is small. For the construction of partitions, floors, and roofs the Cunnah-Wright sheets leave nothing to be desired: the wall or partition can be finished in a few hours. The thickness need only be 2in., and it is fire-proof as well as impermeable to damp and cold. The sheets measure 3ft. 6in. by 3ft., or 3ft. 6in. by 2ft. 6in., widths that will be found convenient for different lengths of wall. The system is well suited for bungalow building and single-story pavilions, and a plan and view for a small bungalow for Buenos Aires, constructed on the Cunnah-Wright system, is given. We also find notices of its successful application to railway sheds, stores, cricket pavilion, isolation hospital, and partition of mansions in Queen's Gate. These views give a capital idea of the way the dovetailed sheets are used. The connection with cross partitions, and the finish of the sheets at door and window frames, are illustrated. The list of the buildings in London alone in which the system has been used is a long one. We recommend the Cunnah-Wright patents to all architects who want fire, sound, and damp proof partitions and ceilings.

ARTS AND CRAFTS FROM GERMANY.

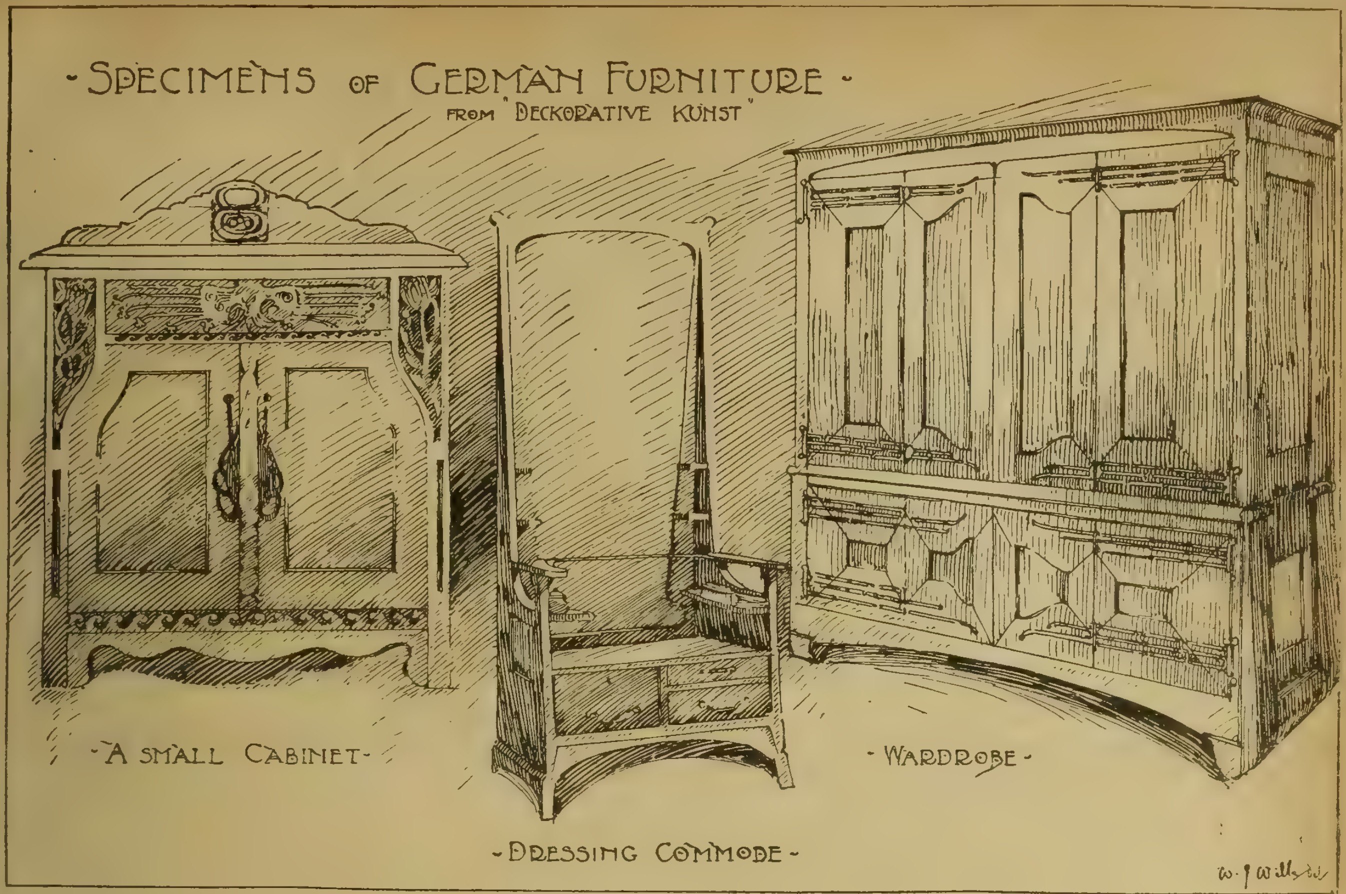
[WITH ILLUSTRATIONS.]

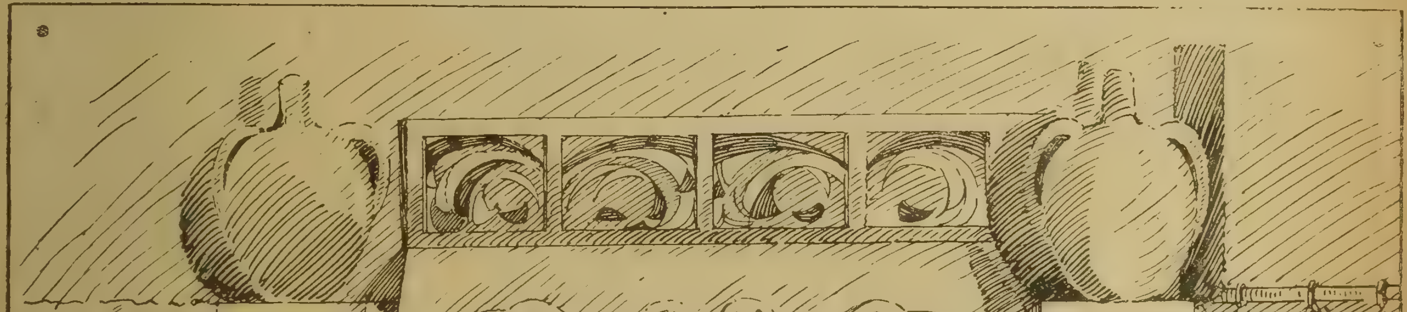
For a long time now the art students of this country, and those in Germany and France, have been paying each other the greatest of all compliments in imitating the productions emanating from their several schools of art and technical classes. There is nothing particularly novel, perhaps, in such a practice, and, indeed, within limits no objection can be taken to it. Emulation, of course, is a very good thing. At present, however, the rage for some startling notion, some *outré* development, some novelty, or an abnormal extravagance of some sort, is being sought for both at home and abroad. At many an art school, and we may say in most we have observed what books the students are asking for, and noticed what they study. These are not standard books of historic art, but contemporary magazines and illustrated journals devoted to the arts and crafts. Among the foremost of these is the admirable *Dekorative Kunst* published by Mr. F. Bruckmann, of Munich. This publication is replete with photographic reproductions of all kinds of design for lace, fabrics, pottery, book-covers and book-plates, glass, and furniture. Much of the work is undoubtedly good, and the present collection of similar things at the New Gallery, under the auspices of the Arts and Crafts Society, reflects an acquaintance with German crafts of a like kind running on the same lines, and striving after a kindred type of so-called originality. The Continental artist, naturally more facile and also more emancipated from the influence of preconceived notions, no doubt speedily outstrips the British designer on the lines we have indicated, and gives him points, so to speak, in producing the unusual. Examples of this class of work, however, undoubtedly have a value and an interest which few can afford to ignore, while they also enable any observer to adequately appreciate the claim for originality which some of the exhibitors at the above-mentioned exhibition evidently are priding themselves upon.

We shall, therefore, from whatever point of view, be doing some service by drawing attention to Mr. Bruckmann's monthly, the *Dekorative Kunst*, and the best way of effecting its introduction to our readers is to reproduce some of the furniture designs illustrated in recent numbers. This we do with the publisher's consent. Little description of the articles selected for reproduction is needed, for they explain themselves. The chimney-piece, by Mr. J. Englehart, comprises a sculptured representation of the Temptation, with full-length figures of Adam and Eve; the serpent being wrought presumably in metal, probably in bronze. This composition differs from the bulk of the work now so fashionable; but it follows the lines in vogue in the foliations and determination to combine startling effects with the use of sculpture. The figures are, however, independent of any structural motive, filling a space ingeniously, but in no essential sense belonging to the building up of the fabric. The sides and shelf of the chimney-piece appear to be structurally independent of them. Quite apart from the sentiment of the idea, it is doubtful if the fireplace would be entirely agreeable to live with constantly. Mr. Baillie Scott contributes a buffet of solid proportions in the most approved mannerism, with strap hinges and primitive forms curiously decorated. The china cabinet by Mr. B. Pankok has a glazed central door with the inclosing framework somewhat V-shaped in outline, fret-carved at the top, with shelves for small things on the return sides. Mr. E. Walter's music cabinet in polished hardwood has metal fixings rising from the hinges of the fall-down front, the piece being supported by bandy legs, which are strengthened by way of freshness with straight-lined struts. The sofa by Mr. Walter has a high back, crowned by a cornice and a pleated fabric back filling after the manner of the near side of upright pianos. Mr. O. Fischer's cupboard stand is self-explanatory. Our letterpress illustrations accompanying these few notes are also from the same source, showing how their designers, by shaping rails and stiles, by mitring the joints, and by lessening the area of panels as compared with the framing, seek to introduce newness of form. The wardrobe is an instance in point. Mr. R. Riemerschmid, of Munich, is its designer. Mr. H. Schlicht's small cabinet furnishes a like example, with carved and inlay enrichments. The former-named artist is responsible for the pier-glass dressing commode, shaped like a chair, with shelves for the toilet. The body of the piece is occupied by drawers. The last drawing given from *Dekorative Kunst* is a curious ingle-nook fireplace, enlivened with Keramic work of rich colouring, with flatly-treated Celtic enrichments on the hooded structure and jambs.

Some of the illustrations in the magazine under contribution are printed in colours, wanting sometimes the tones most calculated to show the designs selected to the best advantage. The jewelry and personal ornaments are among the best of the works represented, and in this category must be named the leather-work and inlays for bookbinders. The haberdasher's shop-front, shown in the November part, from Paris, designed by Mr. C. Plumet, is very elaborate, with curious ironwork and metal shapings, which, however ingenious they may be as details, do not disguise the fact of the upper structure standing on stilts over a range of plate-glass windows divided by frames of the slightest possible scantlings. These occur on both fronts of the Hôtel de Russie, from whence the illustrations are taken. Thousands of shops are similar in this essential defect, which Mr. Plumet has done but little to overcome. The interior fittings of the same establishment by the architect are in keeping, and certainly are above the average.

From what has been said in these remarks, it will be evident that the art student does well to look at such books as this one, though we question if good taste is to be found in a mere straining after novelty for novelty's sake, simply to arrest attention by ungainliness, strangeness, and oddity.





ARTS AND CRAFTS FROM GERMANY.

THE SOCIETY OF ARCHITECTS.

THE third ordinary meeting of the 16th session of the Society of Architects was held at St. James's Hall, Piccadilly, W., on Thursday evening in last week, the chair being occupied by the President, Mr. T. Walter L. Emden, J.P., L.C.C. The following additions to the membership roll were elected by ballot. As members: W. Bilston, Eastnook-place, Dover; William E. Healey, 44, High-street, Sutton Coldfield, and at Walsall; Frank H. Jones, 7, Salisbury-terrace, Dorchester; G. F. Merriman, Worcester Park, Surrey; A. C. Payne, 30, Museum-street, W.C.; William Sherriff, 89, Pilgrim-street, Newcastle-on-Tyne, and Frederick Smith, Bank Chambers, New Brompton, Kent. As student: N. A. Leech 141, Adelaide-road, Hampstead, N.W.

THE STATUTORY REGISTRATION OF ARCHITECTS.

Mr. Ellis Marsland, Hon. Secretary, read a paper on this subject, which was given *in extenso* in our last issue, p. 794.

Mr. William Woodward, A.R.I.B.A., in proposing a vote of thanks to the author, described the paper as brief, pithy, and interesting, adding that he had heard many objections raised on the Registration Bill by members of the Institute, but had never yet heard a commonsense argument brought against it, and in principle he believed the abstract case for registration was unanswerable. The original opposition was not to the Bill itself, but to its supporters—the Society of Architects, and the jealousy exhibited by the Institute towards the younger body was the more strange, as under the measure the Institute was made the examining authority. Of course, technically, the Bill was not being promoted by the Society, but by a Registration Committee; but when the measure eventually passed, which it assuredly would do, the credit would be entirely due, and would be generally given, to the Society of Architects. The proposition was perfectly reasonable, and would serve for the protection of the public, for it would insure that architects were properly qualified, and would keep impostors out of the profession. Mr. Marsland's scathing attack on the so-called art architect was fully justified, for the buildings designed by such men were as inartistic as it was possible to imagine. He hoped the time was not far distant when this Bill would become law, for it would be beneficial alike to the public and the profession. Whenever the Registration Act was passed they would find the Institute coming forward to claim the credit of the reform.

Mr. E. A. Brayley Hodgetts seconded the vote of thanks, remarking that in both France and Germany an architect had to show a proficiency in his profession before he was allowed to practise, and several of the American States had passed laws for the licensing of architects with satisfactory results.

Mr. E. Guy Dawber, A.R.I.B.A., heartily endorsed all Mr. Marsland's remarks in his admirable paper. For some time past he had been convinced of the desirability of registration for architects, and was doing his best to induce his friends in the profession to examine the question without prejudice.

Mr. Max Clarke, A.R.I.B.A., objected to Mr. Woodward's claim to speak on behalf of the younger members of the Institute on this question. He, himself, took exception to the Bill, and should like to hear from the President of the Society how the Registration Committee proposed to deal with engineers and surveyors under the Bill—was it intended to prohibit engineers from carrying out architectural work? It seemed to be overlooked by the supporters of the Bill that they had a Building Act for London, and building regulations throughout the country that were daily being made more stringent, which ought to protect the public against the action of incompetent architects. When registration was attempted, should the Bill pass, they would have to deal with certain large builders, who carried out, sometimes artistically, large building operations without the recognised aid of an architect. Were these to be prevented from building? The general character of the profession was improving, and he did not think the passing of such a measure as that proposed would be as beneficial as some supposed would be the case.

Mr. Herbert A. Satchell, A.R.I.B.A., would suggest to the advocates of architects' registration, that they should be silent as to the possible effect of the measure in raising fees, as such a suggestion would alienate the public. They needed to be especially careful not to raise a suspicion that trades-unionism actuated the promotors of this movement. Mr. Marsland had suggested that the measure would be beneficial to professional men; but if they wished to see the Bill passed they must urge that its aim was the protection of the public. There had been much criticism of the art architect that evening; but all admit that some architects were more artistic than others, and that there were architects whose work one could not help respecting. To class all art architects together as drivellers would not advance the prospects of the Bill, and it was no discredit to an architect to say that he was a specialist, and did not take out his own quantities or make his own engineering calculations. He did not consider that Mr. Woodward should be taken as representing the Institute; if the younger members of the Institute wanted to stick a pin into the older men, no better man could be found for the job than Mr. Woodward; but they would not consult Mr. Woodward on a question of art. The Medical Acts had been cited as a parallel measure; but medical men dealt with questions of life and death, and so should be examined before being allowed to practise; but this could not be said of architects. The case of the plumbers had also been mentioned; but the registration which plumbers desired was only a trade-union.

Mr. Ellis Marsland, in replying, said not many arguments had been advanced by the opponents of registration. Both Mr. Max Clarke and Mr. Satchell seemed to imagine that those who were not registered would not be allowed to design or carry out buildings, and were concerned as to what would be done with the engineers, surveyors, and builders who acted as architects. If they read the Bill they would see that exactly parallel to the Medical and Dental Acts, no one was to be prohibited from doing the work of an architect; but unless he proved himself to be qualified, and passed an examination entitling his name to be placed on the register, he must not call himself an architect, and could not recover fees as an architect. When the Registration Bill was originally drafted the mistake was made of including engineers and surveyors within its scope; but, owing to the opposition of the members of those professions, the error was rectified, and, in the amended and present measure all allusion to other professions was omitted. It was all very well for Mr. Satchell to say that the promoters of the measure should keep in the background all allusion to the protection of the architect against unqualified men, and only advocate the Bill on public grounds; but if Mr. Satchell had come in contact with provincial men as widely as he had done; he would see that the practising of unqualified and untrained men was a very real grievance in the smaller towns. He constantly heard the complaint from provincial men that the Institute did nothing to raise their status or protect their interests. Registration was desirable alike for the benefit of the public and the profession.

The President summed up the discussion, remarking that for twenty years he had practised his profession independently of any body of architects, but when asked to join the Registration Committee he was led to look into the question, and, feeling it to be a desirable reform, he joined the Society of Architects, by which it was being promoted. There were a great many competent architects still outside any society, and many of those were in favour of registration. He would point out that the Bill did not propose to stop any man from carrying out or superintending building operations, but would stop him from calling himself an architect unless he submitted to an examination of his qualifications. He had had some experience of certain persons who set up as art architects, and some of them appeared in their works, buildings, and speeches to ignore practical matters affecting the constructional problems they endeavoured to solve. They had been told by Mr. Satchell that medical men dealt with questions of life or death, and therefore it was allowed they ought to prove themselves qualified men; but surely architects were as much concerned with the welfare and safety of the public as physicians, surgeons, and dentists. As soon as the Registration Bill was passed there would only be men admitted into the ranks of the architectural profession who had proved their qualification to practise. The Bill did not propose to increase architects' fees, and it was, indeed, impossible that fees could be raised under any such measure, notwithstanding what Mr. Satchell might suggest, and the measure was broadly one for the protection of the public, and of the well qualified designer and supervisor.

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ARCHITECTURE AND MATHEMATICS.

MR. JULIAN MOORE has a paper on "A Lost Principle of Beauty in Architecture" in the December *Fortnighty*, in which he pleads against the dominance of mathematical regularity in the building of streets and houses. He gives an interesting list of the irregularities purposely practised by the old architects for the sake of giving a charm to their buildings. The modern critic of decorative art, he says, would seem to have never learnt anything in his life but the definitions of the first book of Euclid. In street construction this principle of artistic irregularity is even more important, and Mr. Moore thinks our own unassuming Strand is far more pleasant than any of the pompous, straight streets of Paris and America. We should

> induce some of our public representatives to prevent the beautiful curves in our old streets from being Haussmannised into mere vast chutes, as are the French and American boulevards. The success in every way of our chief new thoroughfares—Shaftesbury-avenue and Charing Cross-road—shows that absolute straightness is not needed in a modern street, even from the point of view which must always, I admit, be of first consideration—commercial success and practical utility. These thoroughfares make most natural and rhythmic companions to Piccadilly and Regent-street, and neither produces on the stroller the effect of mental lassitude and a desire to return home—that most undesirable of all desires from the shopkeepers' point of view—that anyone feels after walking along one of the Paris boulevards. Can anyone imagine a walk which for its distance is more fatiguing than from bottom to top of the Champs Elysées? The eye has nothing to rest on except the great Arch, which, for two-thirds of the distance, is out of easy range of the eye, and therefore an object of strain to it, till one has nearly reached the top.

We thoroughly agree with Mr. Julian Moore. The most beautiful street outline in England—perhaps in the world, though only cultured Americans for the most part know it, is Holborn. Let any one who doubts it stand with his back to the Prince Consort's statue on the Viaduct, and look westward—especially in the early haze of a fine Sunday morning before the traffic is astir.

◆

CHIPS.

An adjudication in bankruptcy is gazetted in the case of John Stanton Stow, of Cardiff, architect and surveyor.

Mr. E. A. S. Fawcett, Local Government Board inspector, conducted an inquiry at the town-hall, Evesham, on Friday, as to the application of the town council to borrow £2,700 for purchase of land adjoining the sewage farm, and for sewerage works. The town clerk said the proposed work, estimated to cost £2,400, was required owing to the inadequacy of the existing sewers; and £300 for the purchase of land which was now used for refuse disposal, and upon which it was proposed to make filters in the near future. Mr. R. E. W. Berrington, C.E., Wolverhampton, explained the scheme.

Mr. J. S. Burlingame, who recently died at Wortham, Texas, was born in Elmira, N.Y., 61 years ago. He was an engineer officer under General Grant during the Civil War, and at its close became a railway engineer of considerable prominence in Missouri and the neighbouring states.

No less than 1,400 cottages are to be erected in the Cork Rural District, and the legal expenses alone will amount to £15 a cottage.

Scarborough Town Council have let contracts amounting to £2,600, for a new central fire brigade station in North Marine-road.

The Local Government Board have just addressed a circular letter to local authorities to whom the Public Works Loan Commissioners are empowered to lend money, directing their attention to a notice issued by the Treasury that the rates of interest for loans granted out of the Local Loans Fund after the 2nd of last month will be as under:—For loans repayable within 30 years, 3 per cent. per annum; ditto within 40 years, 3¼ per cent.; and ditto within 50 years, 3½ per cent.

The new headquarters of the Baptist Union of Great Britain and Ireland will be in the new thoroughfare which the London County Council is about to construct between the Strand and Holborn. Kingsgate-street Chapel, Holborn, which was founded in 1735, is to be demolished, and in its place, on a new site which the County Council has given as compensation, the Baptist Church House will stand.

The workshop of Messrs. M. and J. Brown, turners, veneer and timber merchants, situated at 56, St. Leonard-street, Edinburgh, was completely destroyed by fire on Friday night. The damage amounted to almost £4,000.

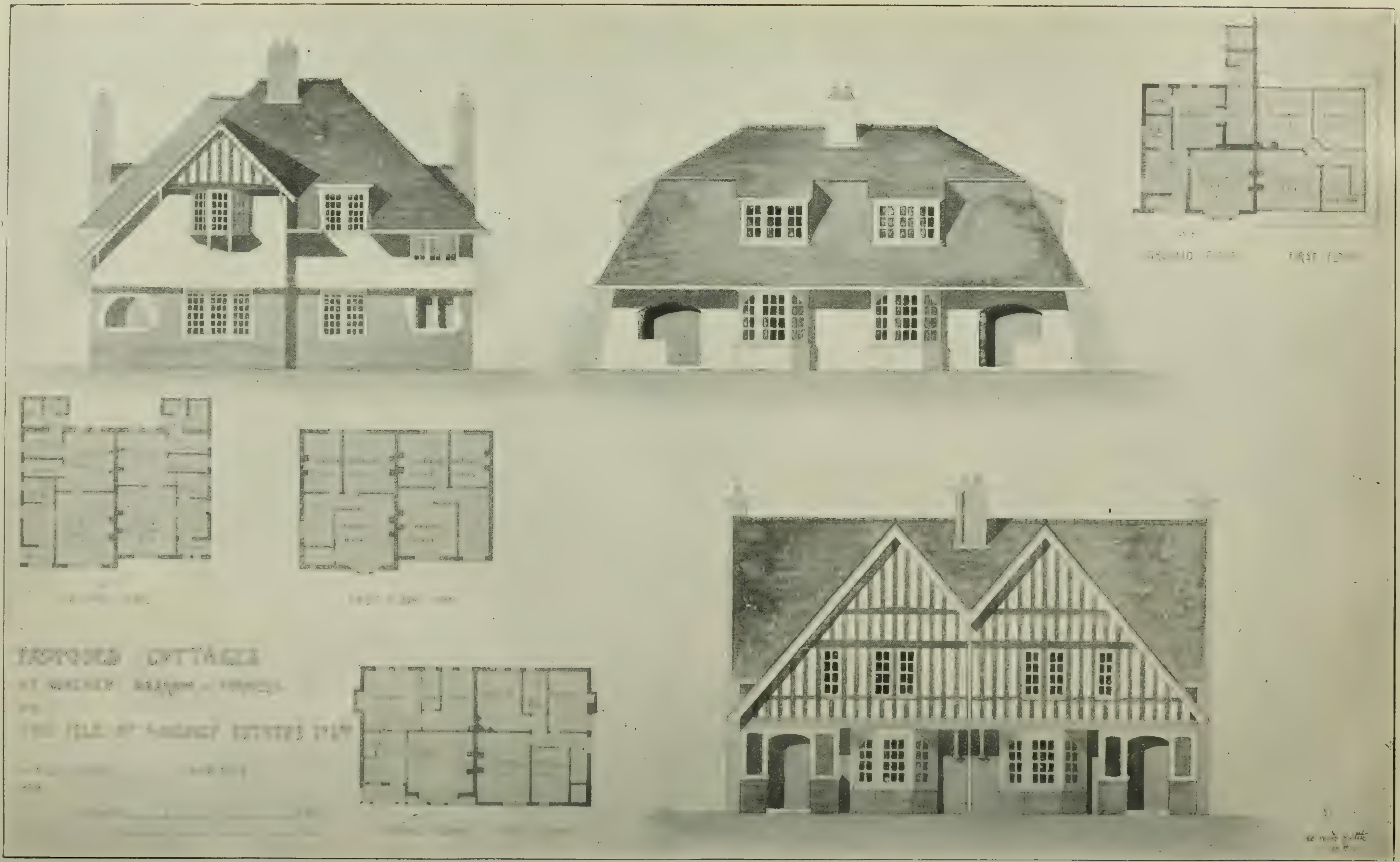
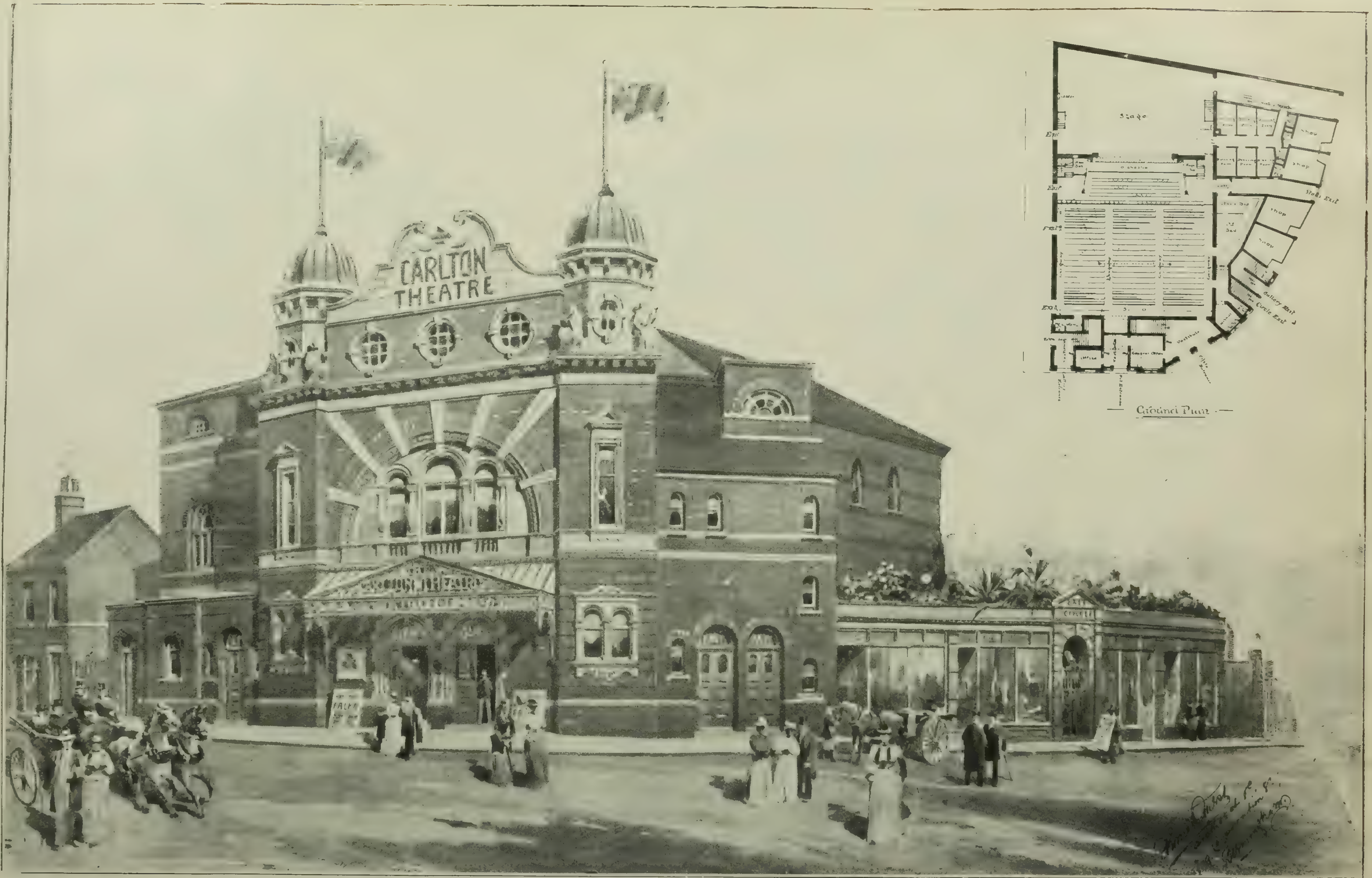


Photo. Process Block by J. A Marshall & Co., Sydenham



CARLTON THEATRE, SALTLEY, BIRMINGHAM.

THOS. GUEST, ARCHITECT.

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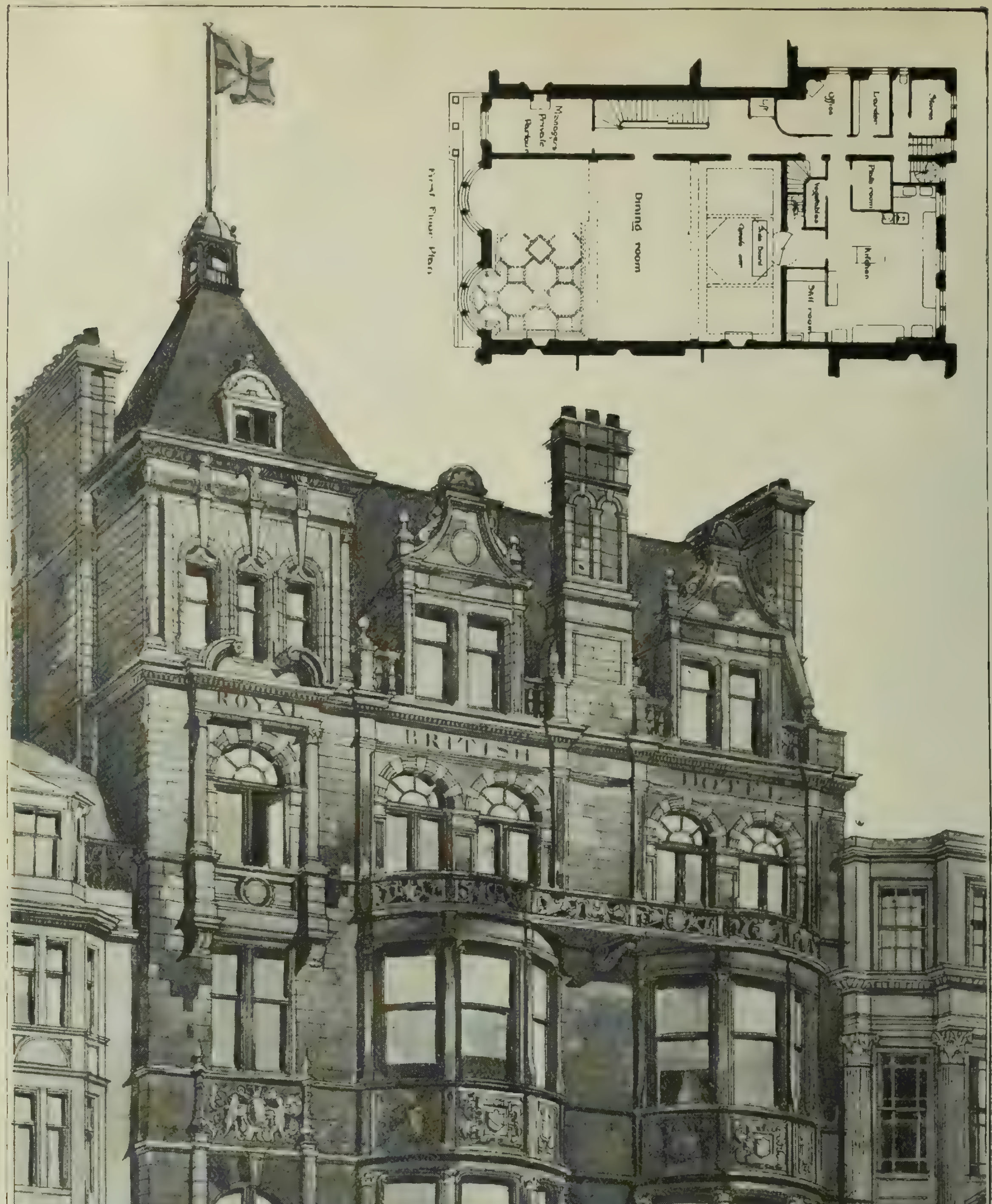

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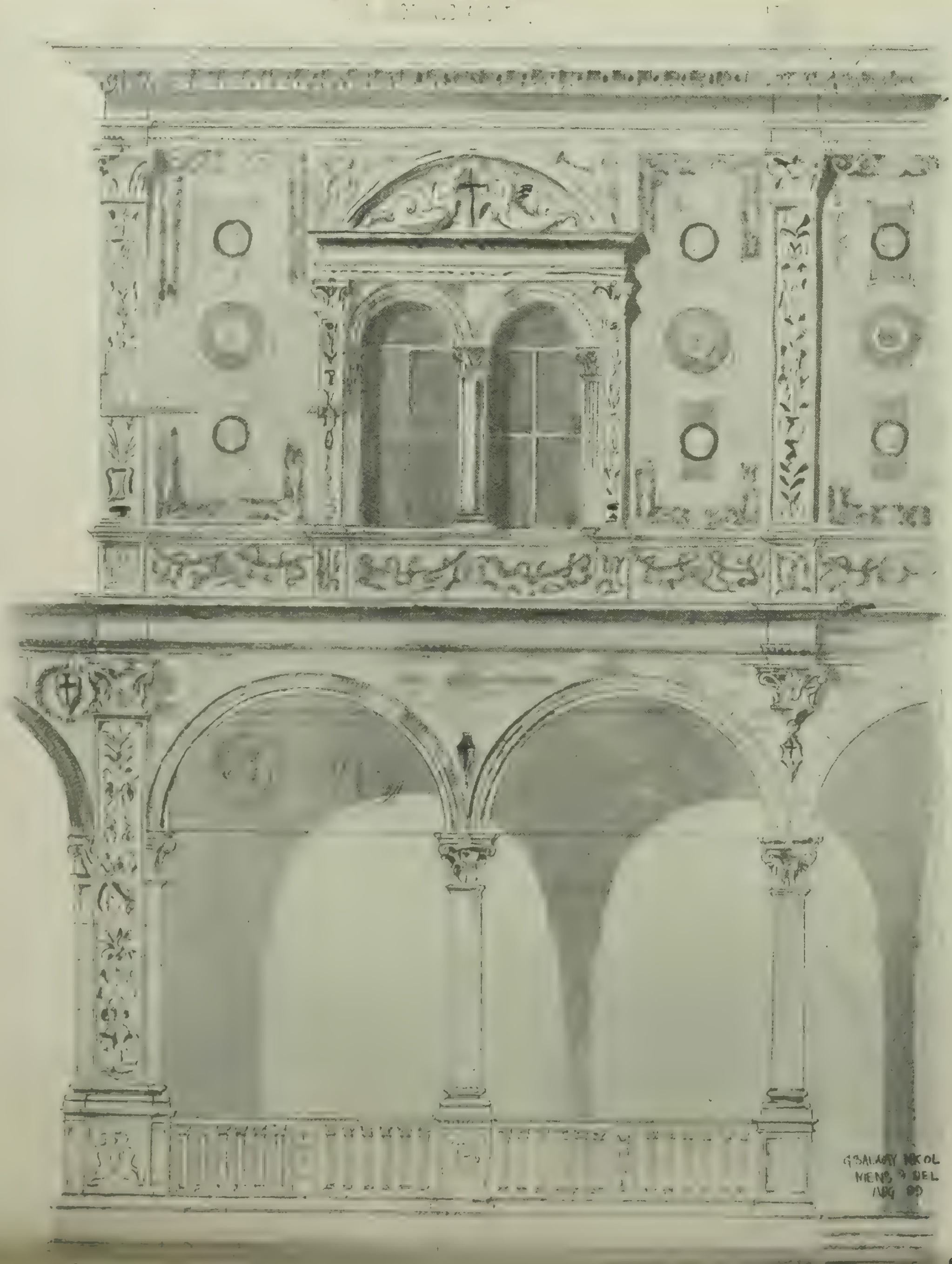
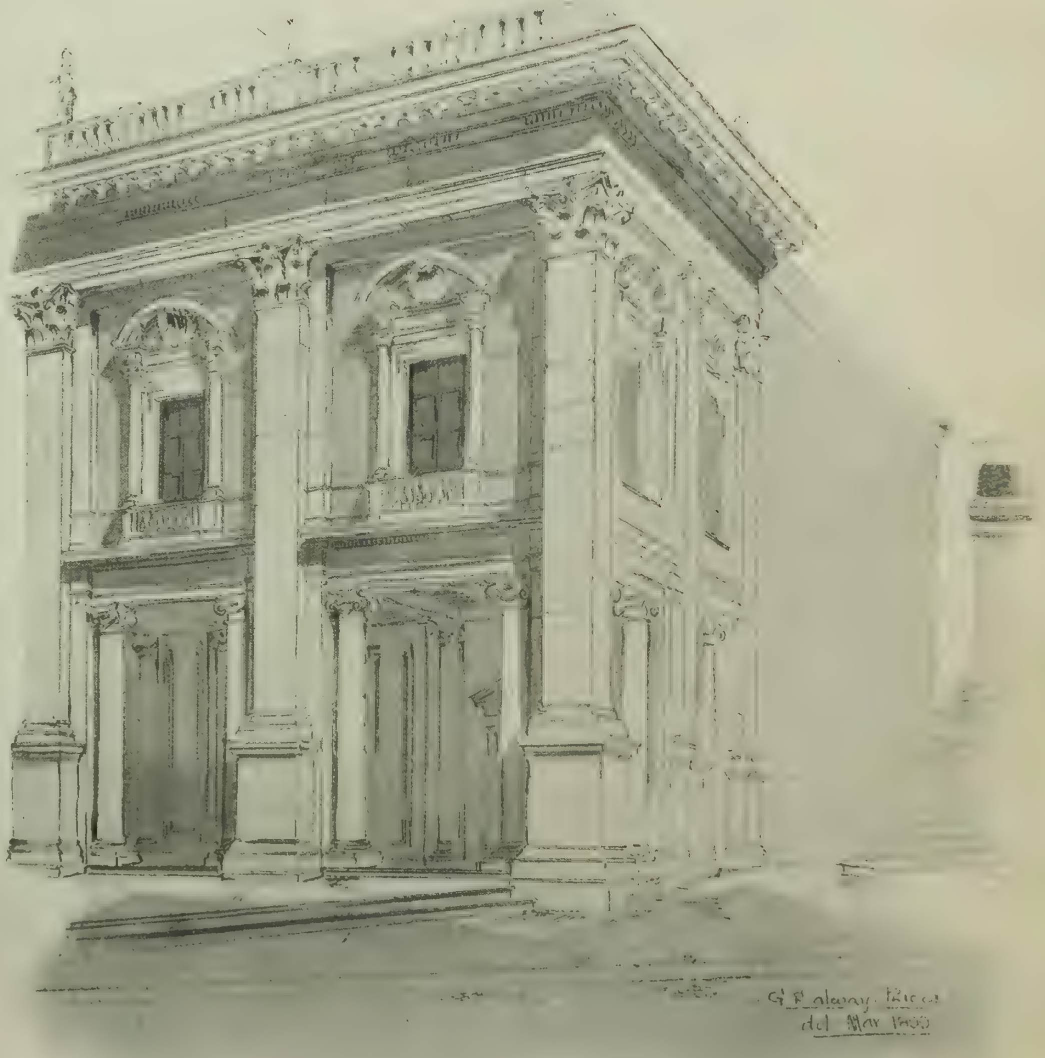
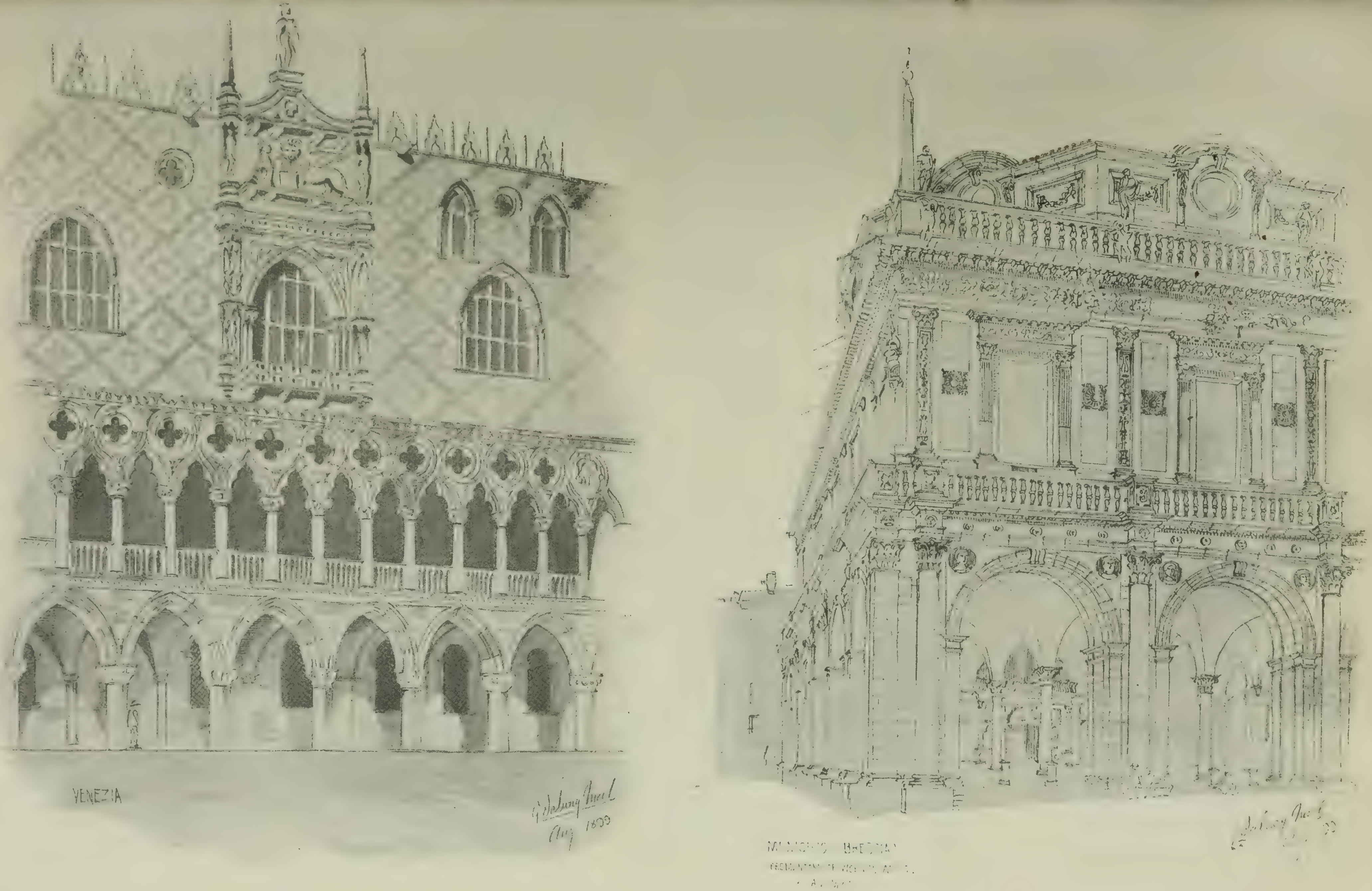
ROYAL BRITISH HOTEL, PRINCES STREET, EDINBURGH.

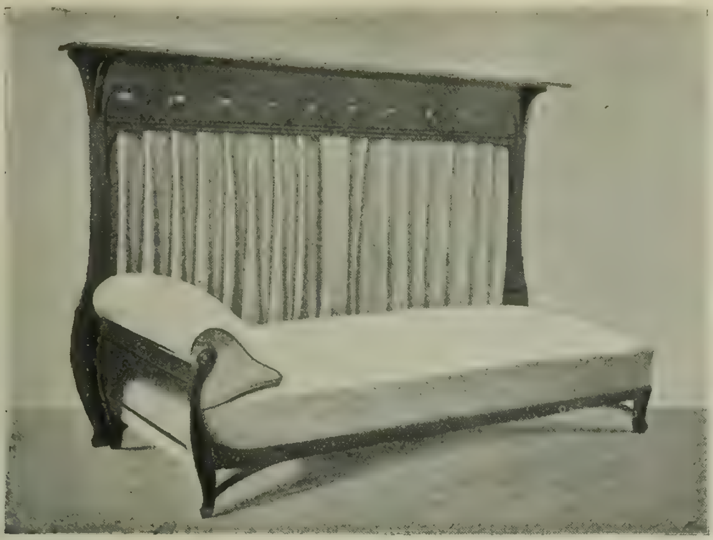


THE CAPITOLINE
MUSEUM ROME
MICHEL ANGELO, ARCT





SKETCHES IN ITALY. By G. Salway Nicol.



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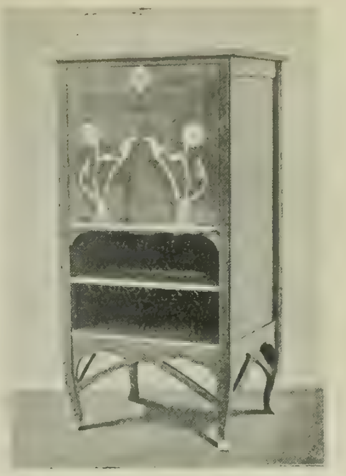

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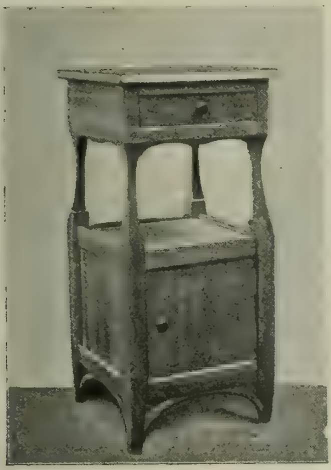
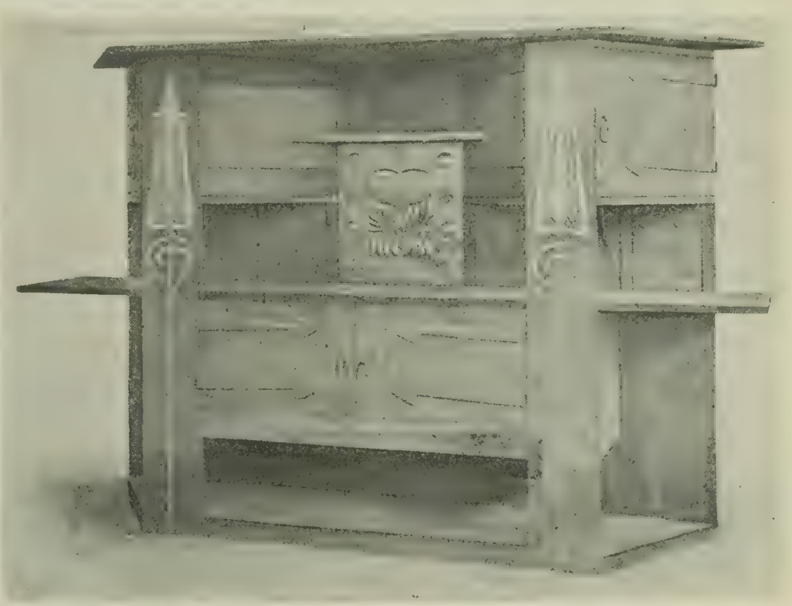
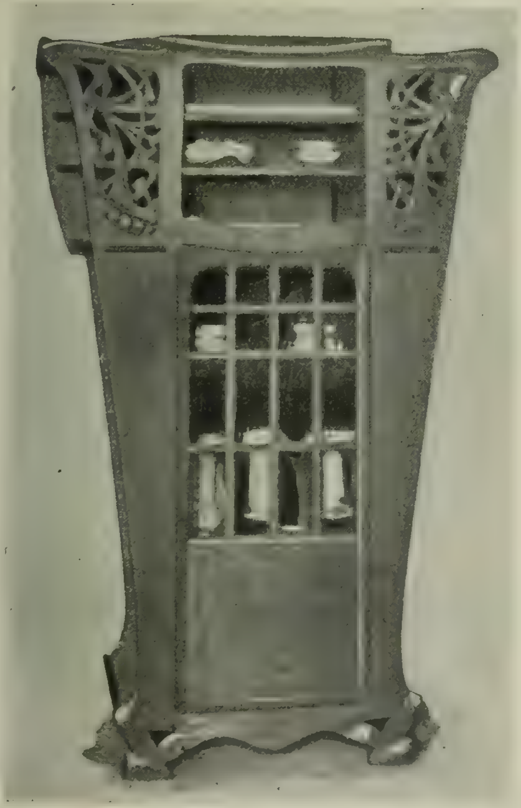


O. FISCHER



M. H. BAILLIE SCOTT



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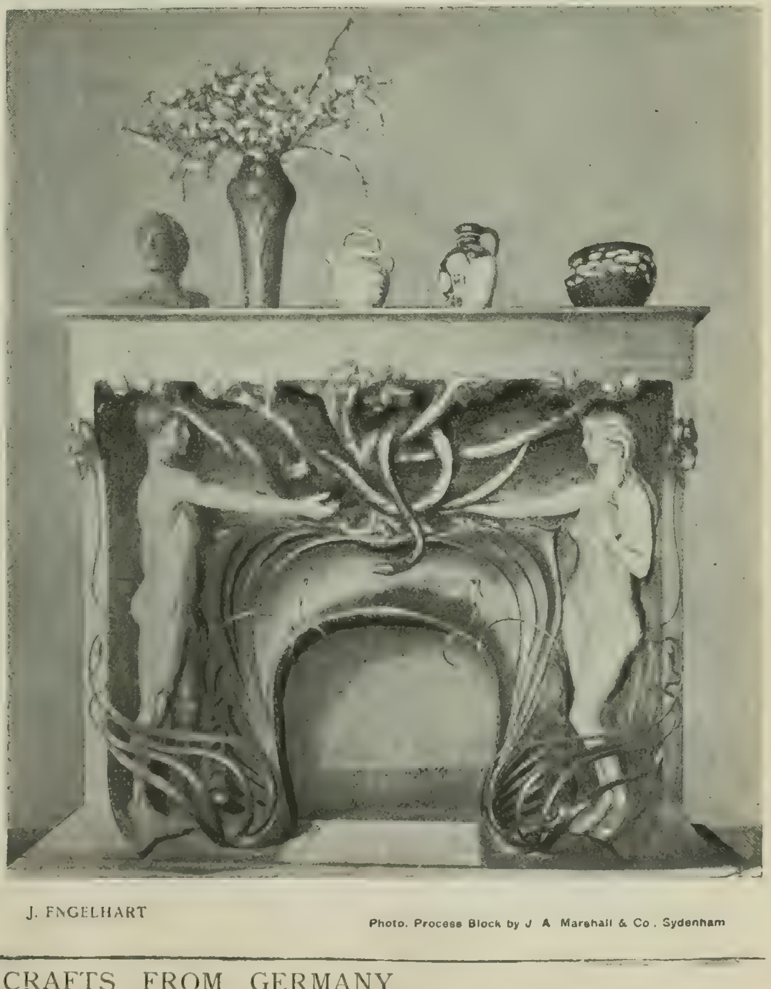

J. ENGELHART

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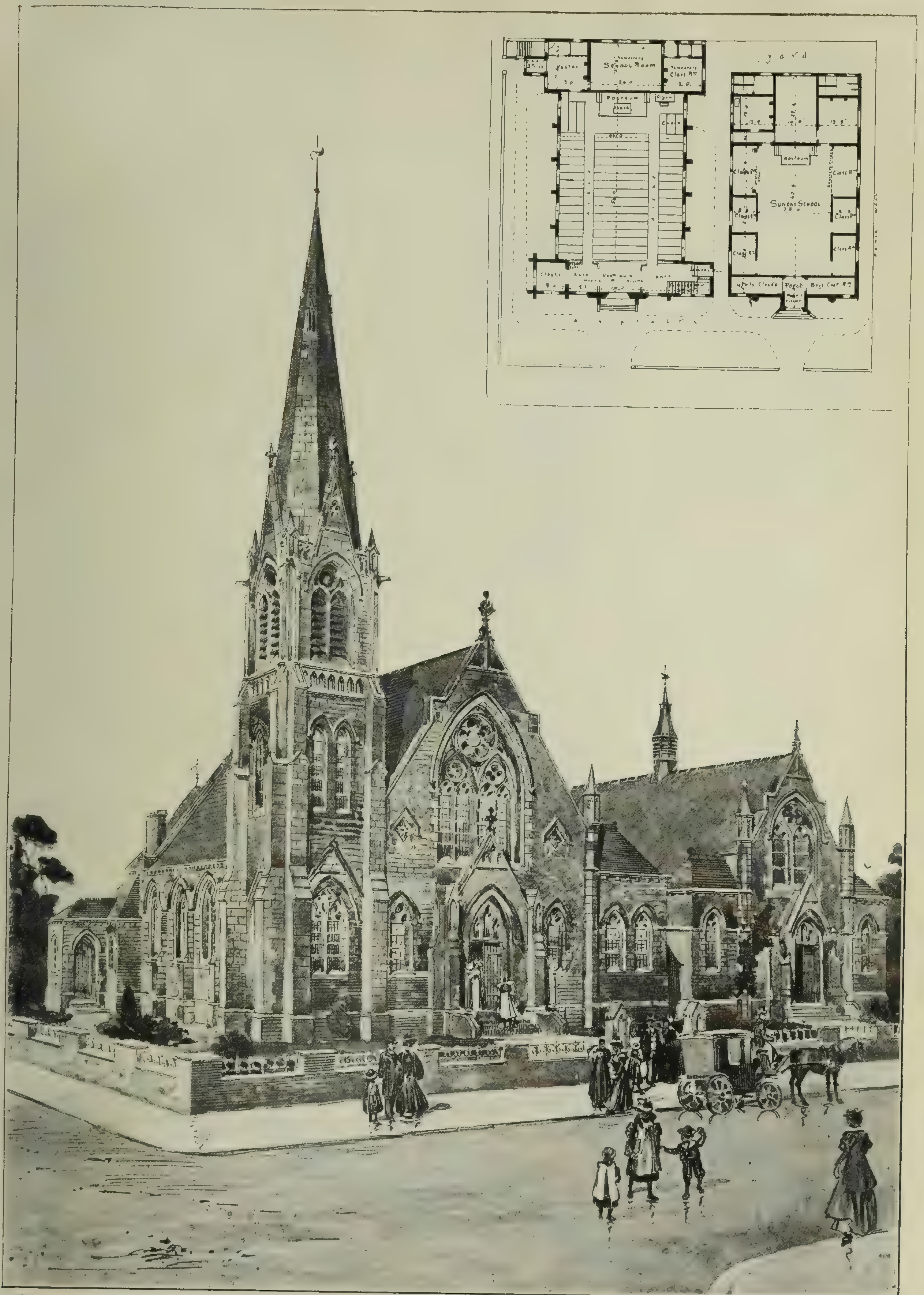
ARTS AND CRAFTS FROM GERMANY.



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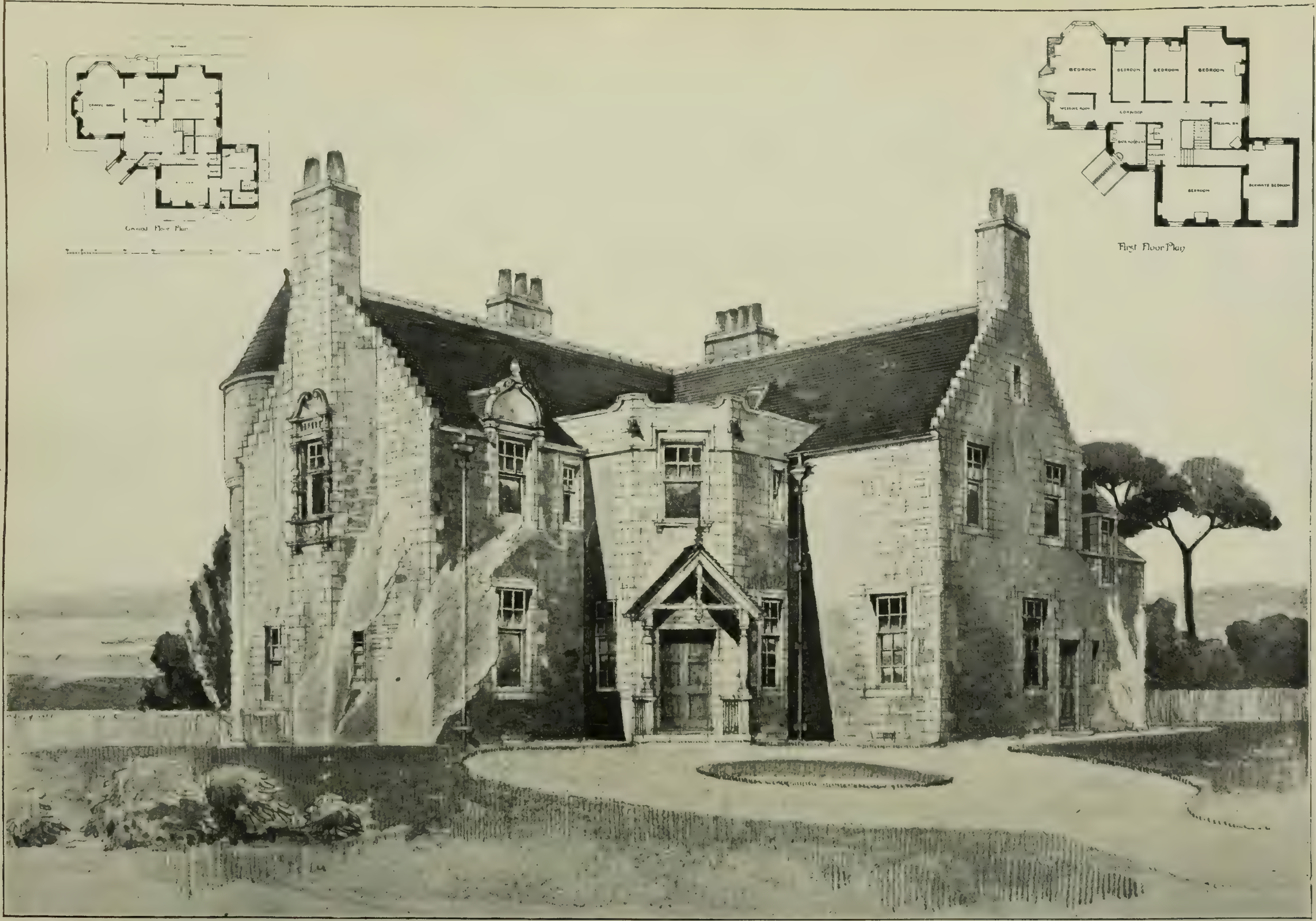
PROPOSED CHURCH AND SCHOOLS, WARLEY ROAD, BLACKPOOL.



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HOUSE AT GULLANE.
CHARLES HAY, ARCHITECT.

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SKETCHES IN ITALY.—ARTS AND CRAFTS FROM GERMANY.—HOUSE AT GULLANE.—CHURCH AT BLACKPOOL—CARLTON THEATRE, SALTLEY.—ROYAL BRITISH HOTEL, EDINBURGH. COTTAGES AT BARROW-IN-FURNESS.—OLD FIREPLACES AT BRISTOL.

Our Illustrations.

SKETCHES IN ITALY.

The Palazzo del Consiglio at Verona stands in the Piazza dei Signori, one of the most picturesque spots in North Italy, being surrounded by old buildings of various dates. The detail drawing shows only one of the four bays which constitute the façade of this building. It was built by Fra Giocondo about 1500 A.D., and illustrates the widespread influence of the Florentine works of Brunelleschi. As in most buildings of this date, its chief characteristic is the beauty of line and execution of the carved and painted ornaments spread all over it, the general proportions and *tout ensemble* not receiving so much attention.——*The Municipio at Brescia* was commenced by Fromentone, an architect of Vicenza, in 1489, and as it has been left by Palladio and Sansovino, who directed its completion, is one of the most splendid examples of the Renaissance in the North of Italy. Fromentone's plan consisted of a large rectangle, half of which was an open loggia towards the piazza, the remainder containing a large staircase from the loggia to the principal apartments on the first floor. The four façades are very elaborately decorated with sculpture, which in all respects was well placed and concentrated. The frieze of the main cornice was modelled in "putto" by Sansovino, of Venice, and was clearly shown in the large photo. of the details published in the Building News of September 10, 1886.——*The Capitoline Museum, Rome.* — The sketch shows a portion of one of the two façades which were erected to form the north and south sides of the Piazza del Campidoglio, from the designs of Michael Angelo. One of them, the Pal Conservatori, was built in 1564 by Prospero Boccapaduli and Tommaso de Cavalieri. The other, forming the Capitoline Museum, was not erected until 1644 by Rainaldi. Although the architects who carried out the work are responsible for much of the detail, the fine composition is one of the best works of the architect of St. Peter's.——*The Palazzo Ducale, Venice*, one of the most famous buildings in the world, is a concrete expression of the character of the great republic whose home it was, and it would be difficult to find its superior in nobleness and refined beauty. Mr. Ruskin's appreciation of the sculpture which enriches it is, perhaps, better known than the carvings themselves. The sketch is of the centre of the façade towards the piazzetta, or opposite the library of Sansovino's design. These two façades fronting each other are quite different in every way, but seem to tell the same story, only in different languages. The Ducal Palace was commenced in 1424 from the designs of Giovanni Buon and his sons, Pantaleone and Bartolomeo.

G. Salway Nicol.

ARTS AND CRAFTS FROM GERMANY.

(For particulars and further sketches see p. 832).

HOUSE AT GULLANE, N.B.

The extension of the railway from Longniddry to Gullane has entirely changed the appearance of the picturesque little village of Gullane, near Edinburgh. Numerous villas have lately been erected, and among them the subject of our illustration. The house occupies a site commanding very extensive views—to the front over extensive golf links, and to the back over undulating sea "bents" to the blue expanse of the Firth of Forth, with the Fife coast in the far distance. Mr. Chas. Hay, of Edinburgh, is the architect.

WARLEY ROAD CHURCH AND SCHOOLS, BLACKPOOL.

These are to be built with parpoint facings and Yorkshire stone dressings, and will accommodate 650. The cost of the church and schools will be £4,500. The rear portion of the church is planned so that it may be used temporarily for a Sunday-school, until the adjoining school is built. The wall between Sunday-school and church will eventually be taken down, and the former made into a chancel. Mr. Herbert Wade is the architect.

SALTLEY THEATRE, BIRMINGHAM.

This building is being erected on an imposing site at the corner of Saltley-road and Nechells-place, at the penny steam tram terminus, Saltley—one of the suburbs, although within the city boundary. It will be conducted upon popular lines, and the prices charged will be those equal to such theatres. The building itself will accommodate upwards of 2,000—in the pit, which is 58ft. 6in. by 57ft., 700, the gallery 700, circle 400, stalls 100. The stage is 57ft. by 35ft., and is 22ft. to the fly-floor, and 41ft. to the grid floor. The proscenium opening is 27ft. wide and 28ft. high. There are six dressing-rooms on the same level as the stage. Internally the theatre will be decorated in model plastic work, picked out in cream and gold. Complete electric-light installation will be put down, supplemented by a complete gas service. The front line of the site is one long sweep; in consequence of this the chief front has been treated independently of the main building, and is placed immediately at the corner. On the left facing Saltley-road are the pit and gallery entrances, and on the right are the gallery and circle emergency exits. Next Nechells-place the site has allowed of four shops being erected. The circle level in the front provides handsome staircase, foyer, manager's office, and refreshment room, with lavatories, &c., and access is provided from this level to the roofs of the shops, dressing-rooms, and pit refreshment-room, which are covered in with concrete flat, and will be converted into a winter garden illuminated with electric light. The elevations are being carried out in Kingswinford facing bricks and buff terracotta from Hathern Station, and the work is being rapidly proceeded with by Mr. T. Johnson, of Great Brook-street, under the direction of the architect, Mr. Thos. Guest, Cobden Buildings, Corporation-street, Birmingham. The entire cost of the building, including furniture, is upwards of £1,400.

ROYAL BRITISH HOTEL, EDINBURGH.

This building occupies a prominent site in Princes-street. The pilasters and trusses at the main entrance and the columns of the first floor oriel windows are of red Peterhead granite. The stone used for the rest of the building is from Prudham Quarries, Northumberland. The outside woodwork is of teak. The main stair steps are of Sicilian marble. The balustrade is mahogany, and all round the entrance hall and up the staircase a panelled dado is carried. On the basement floor, besides the necessary cellar and lavatory accommodation, there is a billiard-room containing five tables, with a buffet adjoining. On the upper floors are several private parlours, drawing-room, and forty bedrooms. The building cost about £20,000. Mr. J. Macintyre Henry is the architect.

PROPOSED COTTAGES AT WALNEY, BARROW-IN-FURNESS.

The cottages are proposed to be erected in the proposed new village of Vickerstown, on the Island of Walney, for the Isle of Walney Estates Co., Ltd. This company has been formed to develop the island, and at present extensive brickworks are being constructed, which, when completed, will enable the company to make all the bricks needed for the erection of the new village, which will be composed of cottages and houses to be tenanted principally by the workmen and officials of Messrs. Vickers, Sons, and Maxim's extensive shipbuilding yard at Barrow. This firm alone propose erecting 1,000 cottages in this village for their men. The illustration shows three pair of semi-detached cottages of rather a better class, and the materials used for the cottages in the top left-hand corner of the drawing are red bricks, rough cast (white) and light green Westmoreland slates. The cottages next to these have all the walls rough-casted, with light green slates; whilst the remaining cottages, with the half-timbered front, have a red-tiled roof. Mr. W. Moss Settle, A.R.I.B.A., is the company's architect.

OLD FIREPLACES, DIGHTON STREET, BRISTOL.

These fireplaces are taken from an old house in Dighton-street, Bristol, which has recently been converted into offices and stock premises. They are of wood, the jambs being of marble, the enrichments formed in composition. They date from the middle of the last century, being good examples of the Adam style, which was much in vogue at that period. The walls and ceilings of the lower-floor rooms are also panelled and ornamented in an elaborate manner. Several of the fireplaces have good cast-iron grates of the same date; but where grates are not shown on the drawing they are of no interest.

E. G. Rodway.

CHIPS.

The Salford Town Council decided at their last meeting to make a new road from the Crescent to Irwell-road, subject to the road, which is to be not less than 54ft. in width, being continued to the cemetery at Agecroft by the landowners themselves. The road, which will form a thoroughfare of easy gradient from the Crescent district to the Wallness, Douglas Green, and Agecrofts districts, is estimated to cost about £25,000.

The proposed new central hall to be erected by the Wesleyan Methodists at Newcastle-on-Tyne is to cost, with the site, over £16,000. The hall will stand on Westgate Hill, a commanding position at the junction of five important thoroughfares.

At All Saints' Church, Peterborough, a new memorial reredos has just been dedicated. The panels contain sixteen figures of saints, heroes, and teachers. Mr. Allan, of Peterborough, was the sculptor.

Three stained-glass windows have lately been presented to the parish church of North Creake, Norfolk. The great east window, which represents the Crucifixion and Ascension of Our Lord, makes a fitting finish to the restoration that has been carried out in the chancel under the direction of Messrs. Hicks and Charleswood, architects, of Newcastle-on-Tyne. The side lights represent the Annunciation and the Resurrection, with representations of prophets, apostles, and martyrs above. In the smaller windows are represented other subjects, including the Purification of Our Lord, the Journey to Jerusalem, the Loss of the Holy Child, and the Finding in the Temple.

The gold medal annually presented by Lord Derby to the Liverpool Engineering Society has just been awarded to Mr. M. Treleaven Reade, of Liverpool, for his paper on "Developable Surfaces," read before the society last session. This is the first presentation of the medal.

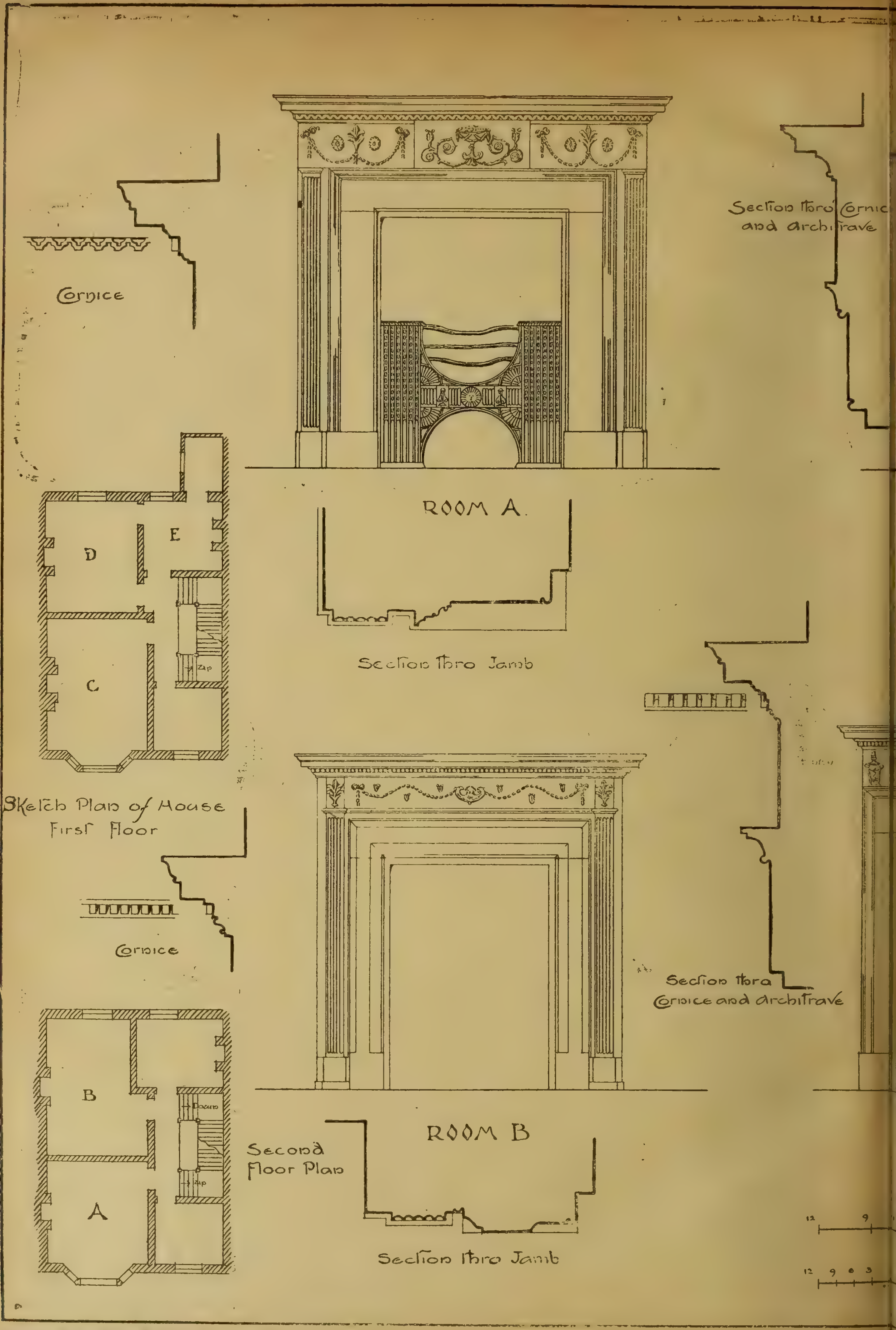
The Local Government Board has sanctioned the borrowing by the Plymouth Corporation of the sum of £43,735 for defraying the cost of the purchase of property required for the Tavistock-road improvement, such amount to be repaid within a period of fifty years.

The Morecambe Urban District Council have arranged terms in London for the acquisition of the Morecambe gas and light undertaking, the purchase price being fixed at £141,000. The profits of the gasworks last year were £5,484, and the dividend 12 per cent. The price works out at 26½ years' purchase. The council have, therefore, lodged a Bill in Parliament for the acquisition of the undertaking, which comes into effect on July 1 next year.

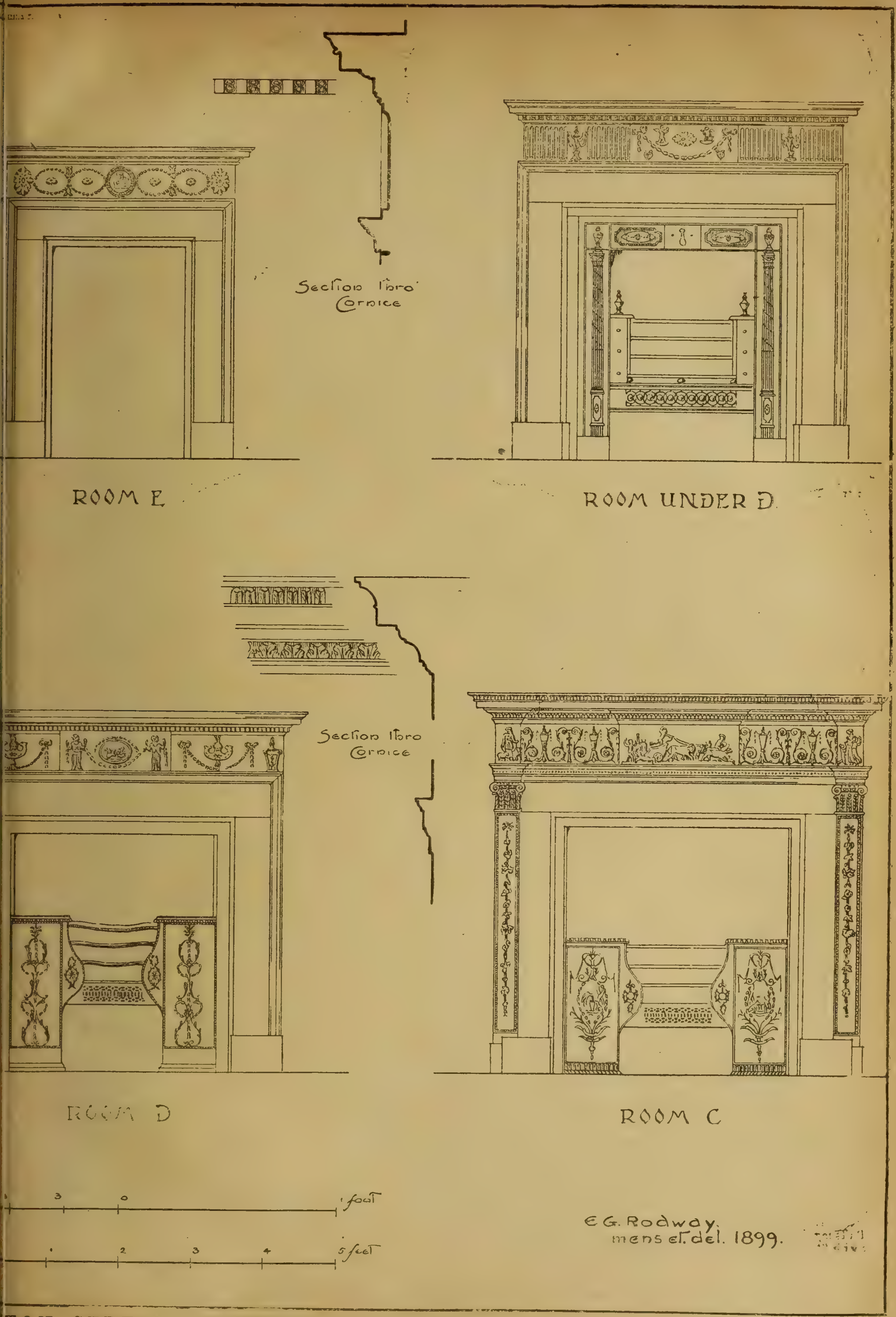
Professor Nussbaum, of Hanover, has discovered that the plastering on the walls seriously affects the acoustic properties of a room. He finds that the best results are obtained by using pure gypsum that has been heated to a white heat.

Among a dozen tenders submitted to the railway authorities of Japan for 6,086 tons of rails and fastenings, for delivery at Tongku next April, Messrs. Jardine and Matheson have secured the contract for £49,726, the makers being Messrs. Charles Cammell and Co., of Sheffield.

The city council of Bath decided, on Tuesday, to raise the salary of Mr. Fortune, the city surveyor, to an inclusive sum of £450 per annum.



OLD FIREPLACES, DI



TON STREET, BRISTOL.

NEW THEATRE, EALING.

THE new Ealing Theatre, erected on the site of the old "Lyric" in the Broadway, is the largest for a place of public entertainment yet sanctioned by the Middlesex County Council. The architects are Mr. George Pargeter and Mr. Walter Emden. Doulton ware is largely used in the elevation. The mouldings have been specially designed and executed in biscuit-coloured material. Four doorways give entrance to the various sections of the building. The back elevation facing Haven-green is treated in fancy brickwork, the north-west corner being capped by an open-domed turret. The scheme includes a theatre, a restaurant, a ball-room suite, which will be available for dances, concerts, at homes, &c., a small suite for minor social gatherings, a second large suite opening on to a balcony overlooking the Broadway, a Masonic Temple, a grill-room, a café, a billiard-room, and a buffet and reading-room, and all the necessary rooms for service, storage, &c. Entering direct from the Broadway the visitor finds himself in a spacious outer vestibule 32ft. by 21ft., from the right-hand side of which extends the grand corridor. This corridor, by an ascent of four steps, leads to the reception lounge, which will extend at the rear of the grand circle the entire width of the threatre. The stalls are attained by a descent on either side of the grand circle. The balcony is reached by a short flight of steps leading direct to that portion. Seating accommodation is provided for 2,000 people. The stage is one of the largest in London, and will have an area of 700sq.ft. The whole building is of entirely fireproof construction, and the illuminant both for auditorium and stage effects will be electricity, with gas in reserve. The ceiling is saucer-domed, and treated in the Early Greco-Classic style. The grand circle front is divided into panels by small Corinthian columns. The panels are filled with Wedgwood representations of Thespian subjects. The panels of the family circle front contain representations of the Fine Arts, and are separated by Grecian vases. The gilded proscenium frame is square, and forms a border for the act drop, which represents a piece of tapestry from the famous Baranth collection. The building is heated throughout with hot water. Eastward of the theatre, leading direct from the Broadway, runs an 8ft. corridor giving access to the Lyric Restaurant. This corridor opens into a reception hall, surmounted at a height of 50ft. by a handsome glass dome. Round this apartment, on the first-floor level, runs a marble balcony, from which ascends the marble staircase leading to the principal rooms on the first and second floors. This ball-room suite, named the Montague Rooms, is entered from the ground floor. The ball-room itself has a dancing space of 70ft. by 40ft., and when used for concerts, &c., will have a seating accommodation for 550 persons. At one end is a permanent orchestral platform, and at the other, the south, is a balcony. A smaller suite is arranged at the end of the buildings to be called the Perceval Rooms. The entire Broadway frontage on the first floor is occupied by a suite of rooms called the Leopold Rooms. The largest of these is 40ft. by 30ft., adjoining which is a reception-room, 29ft. by 16ft., and the ante-rooms. Running the whole length of the Broadway frontage is an open balcony on to the street. The Masonic Temple forms the second floor of the Broadway frontage. The walls are lined with high wainscot oak, and the room is thoroughly equipped in every way. The domed ceiling is as fine as that of the Holborn. The "Glory" is illuminated by electricity, the source of the light being invisible; the same remark applying to the "Starry Firmament." There is a grill-room 30ft. by 20ft., a café, a billiard-room, which will be located in the half basement, a buffet, and a reading-room. The kitchens, and everything connected with them, are in the central top portion of the building, and connect by means of lifts, with service and wine stockrooms on each floor. The depth of the excavations—nowhere less than 20ft. below the Broadway level—gives ample room for extensive cellarage. The lighting (gas and electrical) and the heating arrangements are being carried out by Mr. G. E. Cockburn, of 33, Great Pulteney-street, Regent-street, W. (late partner with Strode and Co.), and are in all respects complete and up to date.

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A Gas and Allied Trades' Exhibition was opened at the Royal Aquarium yesterday, and will remain open until January 23, 1900.

OBITUARY.

WE regret to announce the death of Sir RICHARD THORNE THORNE, K.C.B., principal medical officer of the Local Government Board, by whose exertions the invasion of the country by imported epidemics, such as cholera and plague, has to a large extent been prevented. Sir Richard T. Thorne, who had but recently completed his fifty-seventh year, unexpectedly succumbed to failure of the heart, due to varicose veins, on Monday. He was trained at St. Bartholomew's Hospital, and in 1870 entered the medical department of the Privy Council, which was afterwards transferred to the Local Government Board. In this capacity he continued for many years to discharge the routine work of the office, in the way of inspections and reports, until 1885, when his mastery of the French language led to his selection as delegate of the British Government at a first International Sanitary Conference, which was held at Rome, and was followed by others at Venice, Dresden, and Paris. In these conferences Sir Richard took from the first a leading part, and was mainly instrumental in convincing the representatives of other governments of the futility of quarantine. Sir Richard received the distinction of C.B. in 1892, and that of K.C.B. was conferred upon him in 1897, soon after he had succeeded the late Sir George Buchanan as the head of his department. He had written several treatises on diphtheria, tuberculosis, and kindred subjects, and his annual reports on the progress of national sanitation were models of lucid statements of facts and the lessons to be drawn from them.

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CHIPS.

The Belfast Tramway Company have just erected new premises at their headquarter depot in Sandy-row, at a cost of £26,000. The contractor was Mr. John Harvey, of Millfield, Belfast.

The War Office authorities have concluded a contract with a Belfast firm for the extension of Ebrington Barracks, Londonderry, at a cost of £26,000.

An association of the qualified surveyors of Queensland has been formed, under the title of the "Queensland Institute of Surveyors." The following have been appointed a committee to draft articles, rules, &c.:—Messrs. C. B. Lethem, D. F. McLean, H. Raff, G. Phillips, E. H. McArthur, A. A. Spowers, and R. J. Willcock, with Mr. John Allan, of the Surveyor-General's office, Brisbane, as hon. secretary. All surveyors qualified in the colony, and applying for admission prior to the incorporation of the institute, are to be admitted to membership without ballot on payment of the opening year's subscription.

Good progress is being made with the building of the Cheltenham-road branch free library, North Bristol. The library will be Renaissance in style, and built of Cattybrook bricks with freestone dressings. The front elevation will be 65ft. wide and 38ft. high to the parapet, while the building will extend back about 100ft. The façade will be divided into three bays, and will be finished with frieze, cornice, parapet, and balustrades. Mr. W. V. Gough, of Bristol, is the architect, and Messrs. Wilkins and Son, of the same city, are the contractors. The outlay, including cost of site, will exceed £11,000.

An inquiry was held last week at West Kirby on behalf of the Local Government Board, by Mr. W. A. Duckett, into an application by the Hoylake and West Kirby District Council to borrow £27,000 for the purposes of electric lighting.

Another stage in the procedure connected with Private Bills for 1900 was completed on Saturday night by the deposit in the Bill Office of the House of Lords of prints of measures it is intended to proceed with. At the closing hour the number which had been lodged was 269, as compared with 267 on the corresponding day of last year, and 248 on that of the year before.

On Friday an inquest was held at Wolverhampton on the body of Mr. George Cave, aged 61, builder, of Raby-street, who died from the effects of an accident. He was walking off a footpath at the corner of a street when he was knocked down by a horse and cab which he did not notice coming. He was badly injured, and died from the effects. A verdict of accidental death was returned.

The memorial-stones of a new Wesleyan Chapel at Huntington, near York, were laid on Wednesday week. The chapel will provide accommodation for 133 worshippers, and a schoolroom which is to adjoin is for 84 children. There will also be a classroom, a minister's vestry, &c., adjacent. The cost of the building is estimated at £1,100. Mr. E. Taylor, of Stonegate, York, is the architect.

Building Intelligence.

EASTLEIGH.—Extensive alterations are now in progress in the parish church of Eastleigh, Hants. The place, which was originally an outlying part of the parish of South Stoneham, containing three farmhouses and a few labourers' cottages, has, since the London and South-Western Railway made it an important junction and (in 1891) moved their carriage and waggon works there, grown into an artisan settlement of over 8,000. The parish church was built in 1868, largely through the generosity of Miss C. M. Yonge, from the designs of the late Mr. G. E. Street, R.A. In 1884 a north aisle was added by Mr. J. L. Pearson, R.A., bringing the accommodation up to 350. This has now proved inadequate, and the late Sir A. Blomfield prepared plans whereby the existing church is to be incorporated as a side aisle into a larger building, to seat over 900 people in all. The nave and aisle of the larger building have now been taken in hand, at a cost of £6,700, the first stone having been laid by Mr. Wyndham S. Portal on October 7th last. The cost of the completed building will be £10,000. Towards the sum required to complete the portion now in hand £5,000 has already been paid or promised, and an anonymous friend has now offered a sum of £500 towards the remaining £1,700, provided that another £1,000 is forthcoming by Easter, 1,900.

WINWICK, LANCS.—Building operations at the new asylum works are progressing most satisfactorily. Seven hundred men are constantly employed at the works. The worth of the work already executed represents in money £255,000. The water tower is up to 150ft., and the chimney shaft to 170ft. The recreation hall, so far as the brickwork is concerned, has been completed, and has been covered in. The administration block is in a similarly advanced condition, while the isolation hospital is nearly up to the roof. The residences and one of the chapels are well in hand. The board has decided to provide a farm, with dairies, stables, and full complement of building. This work has not yet been commenced. The total cost of the work will be £300,000. The work has been going on for two and a half years, and is estimated to be fully completed in another two years. The sum of £20,000 will be expended in the provision of electric lighting. The first portion of the buildings will be completed in six months' time, and will be immediately occupied. The architects are Messrs. Crisp, Oatley, and Skinner; the contractors, Messrs. R. Neill and Sons, Manchester; and the clerk of the works is Mr. Beaman.

MANCHESTER.—The memorial-stone of a new board school—the thirty-second school erected by the Manchester School Board—was laid on Saturday in Moston-lane, Moston. The site, of 8,700sq.yds., is in the midst of a rapidly-growing district, and the school, when completed, will accommodate 1,230 children (450 infants, 390 boys, and 390 girls). The total cost, with the site, is estimated at £21,000. The principal front of the school—which will be the longest board school in Manchester—will face Moston-lane, and each department will have separate entrance and exit. The infants' department, which is to be upon the ground floor, will comprise a hall, 62ft. by 35ft., and eight classrooms, as well as cloakroom and two rooms for the principal and assistant teachers. Provision is also to be made upon this floor for an art schoolroom, manual instruction room, cookery room, laundry, and storeroom. The boys' and girls' departments, on the upper floor, will each have a hall 50ft. by 35ft. (and capable of being thrown into one large hall), six classrooms, a cloakroom, and two teachers' rooms. The work is being carried out by Messrs. A. R. Bullivant and Sons, contractors, from the designs and under the supervision of Messrs. Royle and Bennett, architects, Cooper-street, Manchester.

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The chapel-of-ease at Buntingford is at the present time in the hands of Messrs. Grimson and Co., of Royston, who are carrying out works of restoration, it having been discovered that the roof was in a very unsatisfactory state.

A Local Government Board inquiry into the application of the Oswestry Town Council for power to borrow £18,000 for the purpose of acquiring and extending the undertaking of the Electric Lighting and Power Company, was held by Mr. R. H. Bicknell, M.I.C.E., on Wednesday week.

Engineering Notes.

Scarborough.—Recently Mr. C. A. Brereton, C.E., was appointed by Scarborough Town Council to report on the progress of the marine drive works, and the best method of expediting the same. He has now forwarded his report, in which he states that in his judgment the work might be carried through much more expeditiously if the line of the sea wall were brought in, but does not make any recommendation as to what extent this should be done. He does not consider that the bringing in of the line would detract from the appearance of the drive. He further suggests that if a gantry were erected in the centre position of the roadway more men might be employed, and the work in this way hastened.

PROFESSIONAL AND TRADE SOCIETIES.

The Architectural Association of Ireland.—An ordinary meeting of the above body was held on Tuesday, December 19th, at the Grosvenor Hotel, the President, Mr. Geo. Sheridan, in the chair. The following new members were declared elected. Messrs. Geo. P. Beatter, C. K. Douglas, J. W. Gardener, E. W. Bartholomew, and A. C. Scott. Mr. R. Caulfeild Orpen, B.A., Past President, read a paper on "Domestic Interiors," his remarks being confined to the comfort as regards planning, decoration, and furnishing of the homes of men of moderate means. Comfort, both mental and physical, should be the initial principle. He deplored the extravagances, for which ladies are chiefly to blame, which compels us to fill our rooms with "modern antiques," individually beautiful but not making for comfort. More absurd, however, is the affected simplicity of interior treatment which has taken hold of the younger architects of to-day, and the lecturer sketched a room of this type with hooded ingle nook, panelled walls, exposed ceiling beams, &c., and asked how could such a room be furnished as a home without grotesque anachronism. — The Association on December 20th, visited an oil-cake store of Messrs. Paul and Vincents, lately erected by Mr. R. H. Leask, C.E., on Rogerson's Quay. The soil was in a very soft condition, and the foundations had therefore to be designed on the "grille" principle.

Bristol Society of Architects.—At the last meeting of this society, held at the Fine Arts Academy, Queen's-road, Bristol, Mr. W. L. Bernard, the president, in the chair, a paper on "Ancient Churches in the Diocese of Llandaff, together with excavations in the Black and Grey Friars Monasteries in Cardiff Castle," was read by Mr. C. B. Fowler, F.R.I.B.A., who has been conducting the excavations for many years past for the Marquis of Bute. The paper was illustrated with limelight views from photographs and drawings made by Mr. Fowler. The lecturer first of all dealt with the general characteristics and special features of the various ancient churches in the diocese, and illustrated his remarks by descriptions of the various archæological features peculiar to the churches of the district. A complete series of fonts was exhibited, from the earliest examples of Norman character to those of a later date. Mr. Fowler pointed out that in the early times when immersion was practised fonts were large and low; in later times they were elevated on steps and the bowls very much reduced in size. The low side windows at Cogan and Marcross were then touched upon, and the several reasons given by archæologists for their existence were discussed. The only original stone altar to be found in the diocese is at Norton Nottage Church. Sanctus bells are rare, only two being known—those at Porth Kerry and Welsh St. Donats; the latter is fixed on a yew beam over the chancel arch on the chancel side, and it is believed that this was its original position. Some fine specimens of churchyard crosses were thrown upon the screen, but most of them are now minus the shafts and tops; those at St. Donats and Llangan were the most perfect. These crosses almost in every case stand on the east side of the south entrance or porch, and generally a yew tree grows within a few yards of them. There is little doubt that the majority of the towers of the early churches were fortified, and the large inclosed graveyards used as a refuge for the cattle of the villagers during the incursions of the wild borderers. The second portion of the lecture dealt with the ancient monastic buildings of the Black and Grey Friars which, of recent years, have been unearthed at the cost of Lord Bute, under Mr. Fowler's direction. Complete plans of the respective monastic buildings were shown, together with specimens of inlaid tiles, painted glass, metal work, sepulchral slabs, and other features discovered in the course of the excavations. Lord Bute has taken much interest and gone to great expense in laying out the sites of these monasteries; the remains of the tops of the old walls have been protected by brickwork and planted with flowers. Upon the motion of Mr. Frank Wills, seconded by Mr. G. H. Oatley, F.R.I.B.A., a vote of thanks was accorded to the lecturer.

Edinburgh Architectural Association.—At the last meeting of this Association, held in the Royal Institution, Mr. F. W. Deas, architect, read a paper on "Twelfth-Century Buildings in South-Eastern Italy." After a short historical introduction and a description of the character of that part of the province of Apulia which borders the Adriatic, the lecturer dealt with various churches, dating from the end of the 11th to the middle of the 13th century. These were fairly similar in plan and treatment. A lofty, narrow nave was flanked by side aisles, with recessed chapels, the transept was aisleless and of the full height of the nave, and no chancel intervened between the eastern apse and the body of the church. The building material was tufa or travertine with a free use of marble, and the colour of the walls from long weathering was sometimes of great beauty. Splendid as were these churches in their scale, proportion, and simple decorative treatment, they were not less noteworthy for the spirit and execution of the carved ornament, which, at its best, ranked beside the noblest carving in the world. This was found especially at Trani, Bari, and Bitonto, illustrations of which, along with many other churches, were given by limelight.

Leeds and Yorkshire Architectural Society.—An instructive paper was read before this society on Monday evening upon the subject of "Modern Building Construction in Chicago," by Mr. Richard Wood, architect, of Leeds. After dwelling upon the rapid strides made by this wonderful city since the great fire of 1871, the lecturer described the new and scientific methods adopted in the construction of the mammoth buildings that are being erected in Chicago. The marvellous rapidity with which these colossal structures are erected was illustrated by lantern views produced from photographs of a building taken at stages during the progress of the work, from the foundation to the completion.

Liverpool Architectural Society.—The first "members' evening" of the 52nd session of the Liverpool Architectural Society was held on Monday night at the Law Library, Castle-street. After tea had been partaken of, Mr. G. W. Fraser, A.R.I.B.A., read a paper on "Windows and Their Treatment." The popular "bay" window, he said, induced the occupier to think that he had in his possession a room more large and roomy than was actually the case. This window reflected the style of architecture in the Elizabethan day, when Bacon had said that "one could not get out of the sun." Casements were too large, but their advantages were their appearance and facility for being cleaned. Mr. Fraser then dealt with the subject from a technical point of view; after which he spoke on the subject of the filling in of the opening of the windows, hoping that some coming star in the architectural constellation would obviate the use of plate glass, the treatment of which was an acknowledged difficulty. Mr. Fraser was cordially thanked at the close of his address.

Three Towns Architects at Dinner.—The members of the architectural profession of the Three Towns dined together on Thursday evening in last week at the Central Hotel, Plymouth. The chairman of this branch of the Devon and Exeter Architectural Society, Mr. Henry George Luff, A.R.I.B.A., presided, and was supported by Messrs. James Hine, F.R.I.B.A., Charles King, F.R.I.B.A., Edmund Sedding, J. H. Dwelley, A. S. Parker, A.R.I.B.A., W. N. Richards, R. A. Mill, B. Priestley-Shires, A.R.I.B.A., M. Alton Bazeley, C.C., W. H. May, M.S.A., E. Coath Adams, M.S.A., A. Ernest Lethbridge, Arthur Heath, and Harold Watts. The toast of "The Queen," submitted by the chairman, was heartily received. The only other toast was that of "Our Chairman," proposed by Mr. Parker. In responding, Mr. Luff thanked the members for their good wishes, and hoped that during his term of office the society would continue to prosper. Mr. Edmund Sedding recited "The Raven," and Mr. Parker and Mr. Lethbridge rendered some humorous selections. Songs were contributed by Messrs. Adams, May, and Lethbridge. During the evening Mr. W. H. May proposed the formation of an architectural library, and spoke at length as to the details. Several pounds were subscribed in the room, and offers of books to start the library were made. A small committee, consisting of Messrs. Bazeley, May, Shires, Parker, and the chairman, was formed to develop the scheme. On the previous (Wednesday) evening, Mr. Edmund Sedding, of Plymouth, lectured before the members on "Cornish Granite Work," illustrating his remarks with large cartoons and blackboard diagrams. It was announced that at the next meeting Mr. B. Priestley Shires will read a paper on "Opportunities for Architectural Study."

CHIPS.

At Carnarvon County Hall, on Saturday, Mr. G. A. R. Fitzgerald and Colonel Boughey, C.S.I., with Viscount Emlyn as secretary, sat as a Light Railway Commission, holding an inquiry into the proposed Rhyd-ddu and Beddgelert Light Railway. The present scheme is promoted by the North Wales Narrow-Gauge Railway Company. Sir James W. Szlumper, the engineer, planned the proposals.

The Golder's Hill Estate, an extension of Hampstead Heath, was conveyed, on Monday, to the London County Council, and is now dedicated to the public.

The borough engineer of Newport, Mon. (Mr. R. H. Haynes), delivered, on Saturday evening, a lecture before the members of the Newport Association of Civil Engineers, Architects, and Surveyors, on cross river communication. The corporation is seeking Parliamentary powers to erect a transport er bridge over the Usk, similar to the one over the Seine at Rouen.

The urban district council of Paignton, who have hitherto obtained a supply of water from Torquay Corporation, have determined to provide an independent supply. The outlay, as estimated by the consulting engineer, Mr. Baldwin Latham, will be £50,000.

The City Corporation will seek Parliamentary powers next session to acquire Finsbury-circus-gardens, to purchase Spitalfields Market, to apply the Baths and Washhouses Acts to the City, to establish a crematorium at Ilford, and to construct subways in the streets.

The Scarborough Corporation recently purchased St. Nicholas House and grounds for £33,000. It is now proposed to spend an additional £14,000 in the adaptation and extension of the building for the purposes of a municipal hall. Lieutenant-Colonel Smith, Local Government Board inspector, held an inquiry into the subject on Friday. An influential section of the ratepayers wished an entirely new town-hall to be built, but on Thursday night they they withdrew their opposition, and the present scheme has now the entire approval of the town.

The Burlington Arcade has been recently improved by the erection of two arc lamps on each front, which effectually light up the façades. The work has been carried out under the superintendance of Mr. Arthur Baldwin Hayward, architect, 47, Museum-street, W.C. The ironwork was executed by Messrs. Hart, Son, and Peard, of Drury-lane.

The parish church of Penponds, one of the daughter parishes of Camborne, was reopened on Thursday in last week after restoration and renovation. The chancel and new vestry were completed about two years ago, and now the nave, aisle, and porch have been taken in hand. A baptistery has been formed, and on two sides is surrounded with a screen of carved oak. The screen has four panels painted with angles bearing scrolls, and one central one of the baptism of our Lord. The floor is of polished Devonshire marble and polished tiles. In the chancel has been placed a painting of the Good Shepherd.

The Border church of Kirkbride, eight miles from Silloth, was reopened last week after the restoration of the nave, at a cost of £900. The chancel was restored in 1885.

Mr. R. H. Bicknell, C.E., held an inquiry at the Shirehall, Shrewsbury, last week, into the application by the town council for permission to borrow £5,000 for the purchase and adaptation of the Shrewsbury College for the purposes of a technical school. Mr. Dalgliesh, architect, of Shrewsbury, explained the nature of the proposed alterations.

COMPETITIONS.

Armley, Leeds.—At the last meeting of the Leeds Library Committee, the assessor appointed by the Leeds Corporation to decide who should receive the awards of £50 and £20 respectively, offered for the best plans sent in for a new branch free library and reading-room at Stocks Hill, Armley, gave his report. The first prize he gives to Mr. Percy Robinson, architect, Albion-street, and the second to Mr. F. W. Bedford. Mr. Robinson's design provides a general reading-room, an adult reading-room, a juvenile reading-room, and a lending department. The carrying out of the scheme will cost about £5,000.

Birmingham.—At the last meeting of the School Board, the Rev. J. Wood brought forward the report of the Sites and Buildings Committee, and proposed the acceptance of plan marked B for a new school to be erected in Handsworth New-road. He said that nineteen plans were submitted out of twenty-six applications made for the form of conditions. Of the nineteen, seven did not fulfil the elementary conditions laid down by the Board, and they were rejected. The twelve had been on view at the School Board offices for the last ten days, and they were examined by the committee. Many of them in the matter of elevation showed considerable artistic attraction, but in the fundamental requirement of planning all were more or less defective, and whatever plan was selected it would have to be adopted subject to such alterations as the committee might desire. The committee had the advantage of the advice of the architect to the London School Board, but they were not in agreement with him as to which was the best set of plans. Mr. T. J. Bailey, the assessor, recommended the plan marked "G," but the committee recommended the plan marked "B." The committee were unanimous, save with one important exception (the chairman of the Board). Mr. G. H. Kenrick proposed as an amendment that the plan marked "G," recommended by the assessor, be accepted, saying he doubted whether the committee were the best judges of the plans. It seemed to him the judgment of the committee was in favour of continuing the present architects, although they made a graceful concession to the feeling that at least one building should be put up by some other architects, and that there should be a competition. The Board accepted that principle, but, instead of adopting the plan recommended by the assessor, the committee recommended the one which was similar to the schools designed by the architects to the Board. As the Board had taken a new departure, he thought the committee should have accepted the recommendation of the assessor, so that the ratepayers could pass judgment on the different styles. The Rev. J. A. Sharp thought if the recommendation of the committee was approved the public would come to the conclusion that there had been something not very straightforward in connection with the matter. The Bishop of Coventry remarked that he thought a safe rule, when they had an assessor, was to follow his opinion. Looking at the elevation of the plan which was recommended by the majority of the committee, he must confess that he should be very sorry to have his name associated with inflicting upon Birmingham in perpetuity what appeared to be a very bad imitation of a Chinese pagoda. The chairman remarked that he agreed very largely with the Bishop of Coventry as to the ugliness of the "B" plan, and he did not think much of "G"—but it was not so obtrusively ugly. In his own opinion both sets were of equal merit, but inasmuch as one of them had the assessor's recommendation he was inclined to favour that. As a way out of the difficulty he moved a further amendment, that both sets of plans be approved, and that the final selection be postponed until tenders had been received for each of them. This amendment was subsequently carried by 7 votes to 6. The Rev. J. Wood pointed out that this placed the Board in a very difficult position. They could not submit two sets of plans to the Department, nor could they ask builders to tender for two sets of plans, one of which was to be rejected. It was eventually decided that the whole matter be referred to the Sites and Buildings Committee for them to report upon the resolution which had just been passed, as to whether it was practicable or not.

Crystal Palace Band-stand Competition.—Although no design received has realised the object which the directors had in view when initiating the competition, they have, nevertheless, acting on the advice of the president and their assessor, decided to award the premiums offered in the advertisement inviting competitive designs for the new band-stand. It is not likely that any of the designs received will be executed. The premiums have been awarded as follows:—First premium (30 guineas), Messrs. Walter McFarlane and Co., Glasgow; second premium (15 guineas), Mr. Henry C. Eyres, Millfield Cottage, Millfield-lane, Highgate; third premium (10 guineas), Mr. G. M. Ellwood, 55, Alexandra-road, Upper Holloway.

Belfast.—It has been decided to invite competition plans for a new technical school for this city. The site is St. Ann's Market, a vacant space at the rear of the Free Library in Royal-avenue, and the proposed outlay is about £30,000.

Wharfedale.—Mr. E. J. Silcock, C.E., Leeds, has recommended the plans signed "Anti-Microbe," by Messrs. Blackwell and Thompson, of Leicester, for the proposed infectious diseases hospital for the various townships in the Wharfedale Poor-Law Union. These plans, which provide for present and future requirements, are estimated to cost £12,940, and, provided the firm can secure estimates for the execution of the various works at something like that figure, the Hospital Board have awarded that firm the first prize. Pending this result, the second prize has been withheld.

CHIPS.

Mr. Ernest S. Gale, of Falcon-court, 32, Fleet-street, E.C., has been appointed by the Benchers surveyor to the honourable society of Gray's Inn.

Mr. S. E. Britton, chief assistant to the Electric Light Works at Southampton has resigned, on appointment to be chief electrical engineer at Barking, and in consequence of this Mr. F. R. Bridger, second assistant, has been appointed chief assistant, and Mr. S. L. Smith, now third assistant, second assistant.

The new organ in Norwich Cathedral, opened last week, is contained in a case designed by Mr. C. J. Brown, or Norwich, architect to the Dean and Chapter, and executed by Messrs. Cornish and Gaymer, of North Walsham.

The Auctioneers' Institute continues to make rapid growth. At a council just held as many as 58 applications for admission were considered, and resulted in the election of 53 new members, bringing the total up to 1,163.

Dr. F. H. Newell, who has charge of the hydrographic work of the U.S. Geological Survey, has been appointed irrigation expert for the U.S. census of next year.

The city council of Truro have adopted a scheme of sewage disposal, prepared by Mr. F. Candy, of the International Purification Syndicate, the estimated initial ontlay being £1,700.

At the Audit House, Southampton, on Wednesday week, Colonel C. H. Luard, R.E., one of the Local Government Board inspectors, held an inquiry with reference to an application of the Southampton Corporation for sanction to borrow £6,000 for works of paving, £1,500 for the provision of water meters, £291 for the erection of shelters in the Avenue, Prospect-place, and Above Bar, and £272 for works of sewerage.

Mr. Trotter, inspector for the Board of Trade, visited Aberdeen on Friday, and examined the electric trolley system on the Woodside route. He made an inspection of the overhead wires, journeying in a special car from St. Nicholas-street to the terminus at Woodside, and expressed himself satisfied with the character of the work. The inspection of the permanent way took place on Saturday, and the new electric route was opened for traffic on Wednesday.

Mr. E. Kenworthy, surveyor for the past 22 years to the urban district council of Handsworth, Birmingham, has resigned his appointment.

At the last meeting of the town council of Penzance it was decided, after a long discussion, that the salary of Mr. Frank Latham, who was appointed as borough surveyor nine months since, be increased from £200 to £300 from the 25th inst., on the understanding that on the completion of the works now in hand outside his office of borough surveyor he be required to devote his whole time to the duties of his office.

The dedication service of the new district church and schools which have been erected in Knowsley-road, St. Helens, Lancs, by the vicar and congregation of Christ Church, Eccleston, was held on the 14th inst. The scheme includes a mission church, large mixed and infants' elementary schools, and a parish-room, and has been carried out at a cost of £4,000.

SPECIAL OFFER.—CHEAP VOLUMES.

In the course of the next few months we are compelled, owing to the making of the new street from Holborn to the Strand by the London County Council, to remove our Offices and Printing Works. Due notice of our removal will be given shortly. In the mean time, to reduce stock and save trouble of removal, we offer readers desirous of making up sets of back volumes *any volume* in the list below at half price, or post free for Six Shillings each.

Volumes are all in good condition. The offer at this price will only be available till our removal.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the Building News, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

Cheques and Post-office Orders to be made payable to The Strand Newspaper Company, Limited.

NOTICE.

Bound copies of Vol. LXXVI. are now ready, and should be ordered early (price Twelve Shillings each), as only a limited number are done up. A few bound volumes of Vols. XXXI., XXXII., XXXIII., XXXIV., XXXIX., XLI., XLIV., XLVI., XLIX., LI., LIII., LIV., LV., LIX., LX., LXI., LXII., LXIV., LXV., LXVIII., LXIX., LXX., LXXI., LXXII., LXXIII., LXXIV., LXXV., and LXXVI. may still be had, price Twelve Shillings; all the other bound volumes are out of print. Most of the back numbers of former volumes are, however, to be had singly. Subscribers requiring any back numbers to complete volume just ended should order at once, as many of them soon run out of print.

TERMS OF SUBSCRIPTION.

One Pound per annum (post free) to any part of the United Kingdom; for Canada, Nova Scotia, and the United States, £1 6s. 0d. (or 6dols. 30c. gold). To France or Belgium, £1 6s. 0d. (or 33fr. 30c.) To India, £1 6s. 0d. To any of the Australian Colonies or New Zealand, to the Cape, the West Indies, or Natal, £1 6s. 0d.

ADVERTISEMENT CHARGES.

The charge for Competition and Contract Advertisements, Public Companies, and all official advertisements is 1s. per line of Eight words, the first line counting as two, the minimum charge being 5s. for four lines.

The charge for Auctions, Land Sales, and Miscellaneous and Trade Advertisements (except Situation advertisements) is 6d. per line of Eight words (the first line counting as two), the minimum charge being 4s. 6d. for 40 words. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front-page Advertisements 2s. per line, and Paragraph Advertisements 1s. per line. No Front-page or Paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 3 p.m. on Thursday. Front-page Advertisements and alterations in serial advertisements must reach the office by Tuesday morning to secure insertion.

SITUATIONS.

The charge for advertisements for "Situations Vacant" or "Situations Wanted" is One Shilling for Twenty-four Words, and Sixpence for every eight words after. ***All Situation Advertisements must be prepaid.***

Received.—R. M. and Co.—F. S., Ltd.—J. T. A.—B. L.—M. O. H.—Guy.—R. H. and Co.—J. D. and Son.—T. L.—K. and Co.—Y.—S. T. and Son.—R. B.

Electric.—In liquidation, we believe. The usual swindle!

Builder.—Have nothing to do with it. This is not the time for bubble brick companies.

Provincial.—Better stay where you are. You will earn a few shillings more in London, and spend twice what you do now.

General.—A little old fashioned, but very safe and sound people to deal with. Have nothing to do with the second firm named.

Law.—Cannot say without seeing a copy of the contract. Plan should have been attached, in any case.

C. C.—We have described most of them in back volumes. We hear wonderful things about a new damp-proof course that is coming before the public, and that is to supersede everything. We shall probably know more soon.

Long Tom.—Measurements may be taken directly from an isometric drawing, so that this system can be used with great advantage for many purposes. Vertical edges can be scaled directly from the lines representing them, the other or horizontal lines of the object being all drawn at an angle of 30° to the horizontal. The length measured from A to B on sketch would be the real dimension, and the height of cube would be the same.

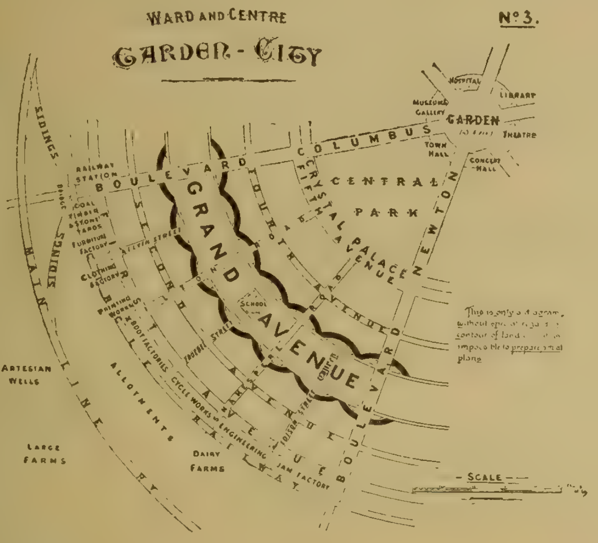
The ceremony of laying the foundation-stone of the new buildings at the City Mortuary, Golden-lane, was performed on Saturday afternoon by the Lord Mayor.

Correspondence.

GARDEN CITY.

To the Editor of the Building News.

Sir,—Mr. Garbett's letter in your issue of the 15th seems to call for a reply. I do not, however, propose to follow him into the minute questions he raises, for probably there is no greater mistake, when dealing with a subject involving cardinal principles, than to obscure main issues by an elaborate discussion of details and the treatment of those as of primary importance. The particular ground plan of a garden city which I have given in my little book "To-Morrow" was never put forward by me with any overweening confidence. I merely outlined it with a view of showing how much better results could be secured by definiteness of plan than by allowing our cities to grow up in a perfectly haphazard manner. Mr. Garbett's plan may possibly be better than mine; but I do not want to discuss that question at this stage. I may, however, send you one of my diagrams, that those wishing to make a comparison can do so.



There is one subject, however, in regard to which Mr. Garbett persists in thinking he is at serious issue with me, when, indeed, there is by no means a cardinal difference between us. He thinks that I wish to build a town limited to 30,000 (though I disclaim any special virtue in that number, and Mr. Garbett will see in my book a "Central City" of 58,000), while he is ambitious that his town shall grow to be one of 600,000. This looks at first sight to be a difference of a very radical nature. But, rightly understood, it is scarcely so. What we both want, in the words of Mr. Lander (which Mr. Garbett accepts), is that "all shall have immediate contact with all forms of beauty, of which the greatest is Nature herself." What we both want is that there shall be social and educational opportunities, which no small town can afford. Now, in my project I seek to secure this result by building a group of towns, each surrounded by an open stretch of country, and each connected with every other town in the group of railways, waterways, and roads, and I call them, for convenience, separate towns. Mr. Garbett seeks to attain, by building one large town of 600,000, the same broad result, "that every adult shall be within half a mile of the open country." Call, then, my group of towns a city, and it might well be so termed, and the difference in principle between us almost disappears. It is but a question which is the better arrangement, a matter which can hardly be fully discussed at this stage. Both of us seek to check the growth of our town at certain points, so as to prevent the undue invasion of the country. My plan, to which I am by no means wedded, is to zone the town completely round, as the City of Adelaide is zoned by its park lands, while Mr. Garbett seeks to secure the same result of combined town and country in a different manner.

Perhaps I may here quote a few lines from "To-Morrow." "The idea of a carefully-planned town lends itself readily to the idea of a carefully-planned cluster of towns, so designed that each dweller in a town of comparatively small population is afforded, by a well-devised system of railways, water-ways, and roads, the enjoyment of easy, rapid, and cheap communication with a large aggregate of population, so that the advantages which a large city presents in the higher forms of corporate life may be within the reach of all, and yet each citizen of what is destined to be the most beautiful city in the world may dwell in a region of pure air, and be within a very few minutes' walk of the country." You see, I call my group of towns a city.

There is one point on which I entirely differ from Mr. Garbett. He thinks splendid cities can be built without architects. I do not, and congratulate myself much on the fact that already two members of the R.I.B.A., as well as several students of that noble calling, are members of the Garden City Association, and will assist us doubtless in securing that measure of concerted wisdom without which we must certainly fail.—I am, &c., Ebenezer Howard.

ENGLISH TOOLS AT PARIS EXHIBITION.

Sir,—We quote herewith a copy of a letter that we have addressed to the editor of the *English Mechanic* with regard to our withdrawal from the Paris Exposition of next year, and shall feel obliged if you will kindly mention the matter briefly in your editorial space.

"We wish to notify you that we have sent a notice of withdrawal of our exhibit to the Commissioners of the Paris Exposition, where we had intended to have made a fine representative display of English-made tools.

"The present ill-feeling in France against anything English is being fostered, we have noticed, by some of the most respectable French papers, and exhibitors have unfortunately no guarantee that the discord will not become more accentuated as the time for opening approaches. This may pass quietly away; but exhibitors who have an interest at stake have *no time to hesitate*, as exhibits should now be in active course of preparation. The value of the Exposition to many English houses will depend largely upon a good English attendance, and we feel that such a conspicuous want of welcome will seriously interfere with the number of British visitors.

"It is possible to be too easily alarmed at the trend of circumstances that may affect the success of the Exhibition; but, although the proposed boycott at the time of the Dreyfus decision was properly regarded as nothing but a newspaper scare, there is now an element of uncertainty that cannot be ignored by those who have relied upon a good British and Colonial attendance amongst the visitors.

"We mention this in extenuation of those whose interest in this matter is identical with our own, and anticipate the same considerations will not influence those whose object it is to cultivate Continental sales, and extend the reputation of other English goods in this market."—We are, &c., R. Melhuish, Sons, and Co.

A CORRECTION.

Sir,—May I correct a slight error in your paragraph (p. 801) with reference to the reappointment of Mr. Arthur Cates, F.R.I.B.A., to the tribunal of appeal? This reappointment was made under sections 175 and 176 of the London Building Act, 1894, by the Council of the Royal Institute of British Architects, and not by the London County Council as your paragraph states.—I am, &c., W. J. Locke, Secretary.

Royal Institute of British Architects,
9, Conduit-street, Hanover-square, London, W.,
Dec. 16.

Intercommunication.

QUESTIONS.

[11392.]—**Quantities.**—Could one of your readers kindly give me information on the following? A large house is being built, the quantities of which were supplied by the architect; but it appears the proprietor gave no direct instructions to him to prepare these, though one of the conditions of the contract is that the charge for quantities and printing is to be paid out of the first instalment. Another condition of the contract is that the proprietor does not guarantee the accuracy of the quantities, and the contractor must verify their amounts before signing the contract, and, after signing them, must take them as correct. It was impossible to test this before signing the contract, as the details and some of the plans had not been prepared. Now it turns out that the plans and specification contain more work and of a better character than taken in the quantities, and, in several instances, additional work not shown in either. Who should pay for this work? The proprietor, the quantity surveyor, or the contractor?—W. W. W.

REPLIES.

[11387.]—**Gable.**—It appears that the gable in question belongs exclusively to B. C. should pay B. for half the wall and gable according to the use made by the former, but A. has nothing whatever to do with the transaction unless there is a special agreement stating that such payment shall be made.—H. Lovegrove.

[11391.]—**Separation of Shop from Dwelling-House.**—A decision has been given that all the public house is licensed, but the result is not considered satisfactory, and a new case in Westminster will be carried to the Court of Appeal to finally settle the question. It seems very important that people sleeping in the upper floors of a public-house should have some ready means of exit.—H. Lovegrove.

CHIPS.

An inquiry was held at the town-hall, Salford, on Thursday in last week, by Mr. W. A. Dacat, inspector of the Local Government Board, in regard to the application of the county borough council for sanction to borrow the sum of £398,683 for purposes of electric lighting and supply. Mr. S. V. Clirehugh, consulting engineer, and Mr. C. L. Turner, resident electrical engineer, supplied the inspector with the necessary details.

The new town-hall, Mevagissey, erected to celebrate the Queen's Diamond Jubilee, was opened on Friday, The hall, 85ft. by 25ft., has three anterooms attached, and is capable of seating 500 persons. Mr. W. Body is the builder.

The late Sanitary Congress at Southampton was not a financial success, the deficit amounting to £115 19s. 6d.

An inquiry was held on the 14th inst. at the Bromsgrove Town-hall by the Earl of Jersey and Colonel Boughey, Light Railway Commissioners, as to the application made to them for an order to authorise the construction of a light railway from Bromsgrove Railway Station to the town, and from the bottom of Rock Hill to Lickey End.

A deputation from the Scarborough Master Builders' Association, conjointly with the architects of the town, waited upon the Streets and Buildings Committee of the Corporation of Scarborough last week with the object of putting before the committee their views in regard to the existing by-laws, and the proposed amendment of the same. Mr. Sinclair spoke on behalf of the builders, and Mr. Tugwell and Mr. Caleb Petch on behalf of the architects. They pointed out certain clauses which they said were an injustice, especially the sizes of the timbers now required in the construction of new houses, and also the requirements of the by-laws in regard to party-walls. The desirability of amending the by-laws with respect to corbles was advocated. The memorial will be dealt with by the committee, and reported upon to the town council.

At a private meeting of the Wolverhampton Town Council the Mayor reported, with regard to the erection of the new free library to commemorate the Diamond Jubilee of the Queen, that efforts were being made to induce a member of the Royal Family to lay the foundation-stone. The plans of the buildings have been altered, and the contract has been reduced from about £15,000 to £12,480, towards which £11,000 has been promised.

LEGAL INTELLIGENCE.

A Launceston Arbitration.—The decision of the umpire appointed by the Local Government Board in arbitration, in the claim of the trustees of the late Mr. F. C. Rowe for £1,200 against the Launceston Town Council, has lately been made known. The trustees claimed the sum of £1,200 for damages in respect to the construction of a sewer across land owned by the late Mr. Rowe, in connection with the carrying out of the recent sewerage works. The umpire was Mr. Arnold Taylor (whose decease last Tuesday we announce in another column of this issue), and he made his award for £200 damages, two-thirds of his expense having to be paid by the trustees, and the remaining third by the town council.

The Value of Property in the Strand.—At the Guildhall, Westminster, Mr. Troutbeck and a special jury heard, on the 14th inst., the case of "Dyer's Trustees v. the London County Council," a claim for compensation in respect of the freehold interest in the premises, Nos. 283 and 284, Strand, and Nos. 44 and 45, Holywell-street, producing a total net rental of £500 per annum. The property covers an area of 2,320sq.ft., and is required for the widening of the Strand at Holywell-street, and the amount of the claim as sent in was £25,027. Mr. Cripps, Q.C., M.P., and Mr. H. C. Biron appeared for the claimants; Mr. Edward Boyle, Q.C., and Mr. Dumas represented the London County Council. Sir John Whittaker Ellis (Farebrother, Ellis, and Co.) stated that the property was very old, and would have had to be rebuilt at the expiration of the lease of No. 284 in 13 years' time. The value of the claimants' interest in the property until the expiration of the lease was £5,000. Upon rebuilding, the property would produce a ground rent of £873 per annum, which, capitalised on the 3½ per cent. tables and deferred 13 years, amounted to £16,587. His total valuation, inclusive of the customary allowance of 10 per cent. for compulsory sale, was thus £23,745. Mr. Daniel Watney (past president of the Surveyors' Institution) and Mr. Edward Holroyd Bousfield (Edwin Fox and Bousfield) gave confirmatory evidence. Counsel agreed that the value of the property until the expiration of the lease should be taken at £4,713. On behalf of the London County Council, Mr. Edward Boyle then called Mr. Samuel Walker (Walker and Son), who estimated the total ground-rent to be obtained after rebuilding at £563 per annum, and he capitalised it on the 4 per cent. table, deferred (until the rebuilding) 14 years, 14½ years' purchase, £8,163, to which he added the agreed sum of £4,713 and 10 per cent. for compulsory sale, making a total of £14,163. Mr. G. A. Wilkinson and Mr. James Green (Weatherall and Green) also gave evidence for the London County Council. The jury awarded the claimants £20,564 and 10 per cent. for compulsory sale, £2,056, a total of £22,620. ——Another case arising out of this improvement was heard on Monday by Mr. Troutbeck and a special jury, that of Fowler's Trustees v. The London County Council, being a claim for compensation in respect of the freehold interest in the Opera Comique Theatre, which is also about to be demolished. Mr. Freeman, Q.C., for the claimants, stated that in the opinion of many leading theatrical managers the theatre was worth about £3,500 a year on lease, the landlord paying the rates and taxes and doing external repairs. This would mean a net income of about £3,080 per annum, which, capitalised on the 6 per cent. tables, 16⅔ years' purchase, showed a valuation of £51,360. To this should be added £3,820 in respect of a small portion held on lease, making £55,180, which, with the addition of the customary 10 per cent. for compulsory sale, made a total claim of £60,698. In confirmation of the estimated rental value of the theatre, Mr. Freeman called Mr. John Hollingshead, Mr. Charles Hawtrey, Mr. Edgar Bruce, Mr. Charles Helmsley, and Mr. Arthur Lewis. Mr. Robert Reid, Sir John Whittaker Ellis, and Mr. F. T. Galsworthy submitted valuations averaging £60,000, inclusive of the customary allowance of 10 per cent. for compulsory sale. It was stated that for years the Opera Comique had not had a thoroughly good play, or it would have paid as well as any of the leading houses, as the demand for theatres at the present time far exceeded the supply. The jury viewed the theatre, and the case was adjourned.

Beaman and Deas, Ltd.—A meeting of the creditors of the above company was held on Friday last, the 15th inst., at the Westminster Palace Hotel, London, at which creditors to the amount of nearly £7,000 were either present or represented. Mr. John Forster, of St. Helen's, was voted to the chair. The chairman gave the history of the proceedings of the debenture holders since the last creditors' meeting, so far as he had been able to discover them, and pointed out that he had learned that £1,000 in debentures had been given to one creditor, some time before the Court appointed a receiver, as collateral security; and another £1,000 in debentures (in addition to a number of ordinary shares as a qualification for a director) had been given, for which no payment had been received. After a full discussion of the situation, the following resolutions were passed unanimously:—(1) That representatives of Babcock and Wilcox, Ltd., New Conveyor Co., Ltd., John Forster and Co., Ltd., J. Melbourne, Schiele Union Engineers' Co., Ltd., Bruce Peebles and Co., R. L. Roberts, J. Rothwell and Sons, Stewart and Menzies, A. J. Liversedge, and J. Young be and are hereby appointed as the committee of creditors of Beaman and Deas, Ltd., and they are authorised to appoint solicitors to submit a case to counsel, and, if counsel's opinion be satisfactory, to commence proceedings on behalf of the creditors. (2) That a levy be made upon the creditors, proportionate to the amount of their claims against the company; such levy not to exceed 2 per cent. of each claim, and to be applied for the payment of legal expenses and to cover the out-of-pocket expenses of the chairman in connection with the business. At a meeting of the committee held immediately afterwards, Messrs. Swift and Garner, solicitors, St. Helen's, who had been acting for the chairman and several other creditors, were instructed to act on behalf of the creditors generally, with Messrs. Woosnam and Smith (who represented several creditors), solicitors, as their London agents. A case has been drawn, and is being submitted to counsel. The solicitors to the debenture holders have been informed of the decision of the creditors, and have been asked to furnish certain particulars.

The Skipton Gas Purchase.—The Umpire's Award.—A special meeting of the urban district council was held in the town-hall, Skipton, on Friday, for the purpose of receiving a text of the award with respect to the recent arbitration on the purchase of the gasworks. The chairman announced the result:—Amount of award for the undertaking, as defined by Act of Parliament, including meter station and cash balance on Jan. 1, 1900, £66,500; plus mortgage debt. The coal in hand on Jan. 1 would be taken at a valuation. The mortgage debt is £4,750, so that the total award is £71,250. The umpire was Mr. J. Mansergh, C.E.

Collapse of a Building in Finsbury.—On Saturday last, about 6 a.m., an iron column in the basement of a stable being erected in Worship-street gave way, and killed John Martin Birch, injuring three other labourers. An inquest was held at the Shoreditch Coroner's Court on Wednesday, by Dr. W. Wynn Westcott, M.B. Dr. Hewitt Oliver, the police surgeon, stated that the deceased was 39 years of age, and had been killed by a blow just below the neck on the spinal cord. The widow gave evidence as to her husband leaving home in good health. The acting-foreman Shaw admitted that the drain plan showed the drain about 5ft. away from the line of columns on the west side, and he had set out the drain on the east side quite close to the base of the column. Mr. Henry Lovegrove, F.S.I., A.R.I.B.A., district surveyor, stated that the works had been commenced in August, and were nearing completion. The contractor was Mr. John Christie, of Uxbridge-road; the architect, Mr. R. W. Hobden. He had inspected the works from time to time, and considered the work well done. He visited the building a few days before the accident and found all the work sound. On Saturday, the 16th, he was called to the premises by telegrams from the London County Council and the Police. He found that a trench had been dug right across the building in the line of the columns on the east side, and the centre column had fallen into the excavation. Under the column there was a bed of Blue Lias concrete 4ft. by 4ft. on plan and 11ft. deep. The trench had been dug by the light of lanterns by the night shift, and he believed that some portion of the concrete had been cut away. All the other work stood well, but in consequence of the fall of the column a space of concrete firm with the girders had fallen. Verdict:—Accidental death, caused by a mistake in digging the trench.

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Dr. W. Nealor Thursfield, for many years past the medical officer of health for the county of Salop, died at his residence, Kingsland, Shrewsbury, on Tuesday last, aged 59 years.

The Parliamentary Bills Committee of Glasgow Corporation have received the report of a deputation sent to London to consult with the Parliamentary agent regarding the Glasgow Buildings Regulation Bill. After some verbal adjustments, the committee approved the bill, and ordered it to be deposited with the clerk of Parliament.

Mr. Arnold Taylor, late deputy chief engineering inspector under the Local Government Board, died on Monday last at his residence, Newstead House, Elm-road, Beckenham, aged 74 years.

The Salford Board of Guardians decided on Friday to proceed forthwith with the erection of cottage homes at Kenyon Junction. A proposal to postpone for five years the building of the new workhouse was rejected, it being pointed out that the existing workhouse is inadequate in accommodation and insanitary in condition.

WATER SUPPLY AND SANITARY MATTERS.

Edinburgh.—The New Contract for the Talla Reservoir.—A meeting of the Edinburgh and District Water Trustees was held on the 14th inst., Lord Provost Mitchell Thomson presiding. The report of the Works Committee on the tenders for the completion of the contract for the construction of the reservoir at the Talla, which had fallen into abeyance on account of the bankruptcy of James Young and Co., Ltd., was read. It bore that, after full consideration, the committee recommended the acceptance of the tender of Mr. John Best, Edinburgh, amounting to £150,071 12s. 6d., no allowance being made for the item for contingencies, for which Mr. Best had filled in no sum in his schedule. With regard to certain minor matters in connection with the schedule, the committee recommended that these be remitted to the engineer and the clerk to adjust the same with Mr. Best; also that they should adjust with him the "time-rates" in his schedule on a fair basis, and that the clerk thereafter be instructed to accept the offer and make all the necessary arrangements. The adoption of the report was unanimously agreed to.

Ilford.—The Ilford Urban District Council by a unanimous vote decided to call a special meeting to promote in the next session of Parliament a Bill to constitute and incorporate a joint water board, consisting of the district councils of Ilford, Barking Town, Grays Thurrock, and Romford, and the rural districts of Orsett and Romford, for the purpose of erecting works for the supply of water. In the event of Parliamentary sanction being obtained, the districts named will be the first London suburban authorities to carry out a scheme of this nature.

Ruabon.—The works for draining Ruabon were formerly opened on Thursday in last week. Mr. E. B. Marten, of Birmingham, the engineer, read to the members of the Wrexham rural district council a description of the works, and stated that the scheme had cost £8,990. It was partly a gravitation and partly a pumping scheme. The sewage from Old Ruabon was pumped up by means of compressed air, supplied by an engine 3 000 yards away at the outfall, which was close to Wynnstay Park, and where the sewage was partly chemically treated, and then run over five and a half acres of land. Mr. Saint had acted as clerk of the works, and Mr. George Law, of Kidderminster, was the contractor.

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CHIPS.

A statue of M. Alphand, who as city surveyor and director of public works did so much even after what Haussmann had accomplished to embellish Paris, was unveiled on the 14th inst. in the Avenue of the Bois de Boulogne.

Mr. W. A. Ducat has held an inquiry at the Birkenhead Town-hall, on behalf of the Local Government Board, respecting an application by the corporation to borrow £115,000 for the purchase of Arudy Estate, Bebington-road, for park and recreation purposes. The town clerk, Mr. A. Gill, stated the case for the corporation, and said the estate comprised eleven acres. There was a house on it which might be available for a museum or for library purposes. Mr. C. Brownridge, the borough surveyor, explained the plans.

The free library presented to Chorley in commemoration of the Queen's Jubilee by Mr. Herbert T. Parke, of Withnell Fold, was formally opened by the donor last week. The building is erected in Avondale-road on a site given by the family of the late Mr. Alderman T. Whittle. The library has been built at a cost of nearly £4,000, and it has been furnished at a cost of about £1,500. It already contains some 8,000 volumes, the reference department having 2,400 volumes. The lending library will have accommodation for 16,000 volumes.

On the recommendation of the City Lands Committee, the City Corporation have resolved to co-operate with the London County Council in the endeavour to secure the preservation, on account of its historic associations, of the house, 17, Fleet-street, and to contribute £2,500 towards the purchase of the freehold, providing the building be not allowed to overhang the public way, but be set back to the general line of the street improvement, and that the decorated room on the first floor be preserved for the public benefit.

At Wilby church, Suffolk, a new organ built by Messrs. Norman and Beard, of Norwich, was opened last week.

Damage to the amount of about £40,000 was done by fire at Coventry on Friday. The outbreak occurred on the premises of Mr. C. G. Hills, builder, Much Park-street, and the adjoining premises of Messrs. Phillips and Marriott, maltsters, were speedily involved. Several volunteer fire-brigades rendered good service in limiting the area of the fire; but the extensive wood-cutting department, the smithy, and other shops on Mr. Hills' premises were destroyed, together with some valuable plant.

Our Office Table.

In consequence of differences of opinion at a meeting of the Clergy and Artists' Association held at Leighton House on Friday, Dec. 15, the Bishop of Rochester, Sir William Richmond, R.A., Canon Gore, Canon Scott Holland, Mr. Henry Holiday, Mr. A. G. Walker, with several members of the committee, and with a considerable number of other members, have decided to resign their membership of the association. A provisional committee was formed after the meeting to take steps for constituting a new association for the same objects.

The space allotted at the forthcoming Paris Exhibition for British works of art executed since May 1, 1889, consists of three rooms and part of a corridor in the new Palace of Fine Art. These rooms afford 466ft. run of wall-space available for hanging paintings, drawings, &c. Sculpture of all nationalities will be distributed throughout the building at the discretion of the French authorities. Works of art will also be exhibited in the British pavilion on the Quai d'Orsay, but the Royal Commission have decided to reserve this building mainly for the display of works by old masters of the British school.

The Finance Committee of the London County Council have just issued the half-yearly return of works executed by the Works Department. The return relates to estimated and jobbing works completed during the half-year ended Sept. 30. During that period fourteen estimated works were completed and certified. The cost of these works is certified at £23,376. Only three of them show an unfavourable result, and in only one case—that of the erection of Wargrave-buildings on the Boundary-street area—is the excess cost serious. In eleven cases the works have been executed at a total saving on the estimates of £1,713. The net result, however, owing mainly to the excess on Wargrave-buildings, is that the saving on final estimates for the half-year is only £587. At the end of the return is a statement showing the totals of the actual cost and of the final estimates of all works executed by the department since its creation in November, 1892. From this it appears that works estimated to cost £838,642 have actually cost £883,232, thus showing a loss of £44,590. The loss shown during the existence of the Works Committee and previous to the reorganisation of the department, as the result of the special inquiry, was £54,954; but since then there has been a saving of £10,364. On the jobbing works which have been carried out since 1895, when the schedule of prices came into operation, there has been a total balance of cost below schedule value, or a saving of £8,624.

The Housing of the Working Classes Committee of the London County Council intend, shortly after the recess, to ask the sanction of the Council to a large scheme for housing the poor in the neighbourhood of Tooting. The site of the proposed new buildings is known as the Totterdown Fields site, and consists of about 38½ acres. The purchase price is agreed at the rate of £1,150 an acre, so that the total amount will be about £44,500. The site is close to the terminus of the Council's tramways, and the other means of access are stated to be good. It is partly in the parish of Tooting Graveney and partly in Streatham. The cottages which it is proposed to erect on the site will be constructed so as to provide for two families each. They will each consist of two self-contained tenements, one of two and one of three rooms. Separate gardens will be provided for each tenement, and, on an average, not less than 30 cottages will be built to the acre. The rent of the tenements should average about 7s. 6d. per week. It is not anticipated that any charge on the rates will be involved by the erection of the cottages. As the Council is at present obliged to repay the cost of the land and buildings in 60 years, it is upon this basis that all the calculations will be made. The committee are unable at present to state precisely the cost per cottage, but it is probable that the total cost of land, roads, and buildings will be about £500,000.

The annual distribution of prizes to the successful students at the Trades Training School, Great Titchfield-street, which is conducted by the Carpenters' Company and other City guilds associated with the building trade, took place on Wednesday night at Carpenters' Hall, London Wall. Mr. Arthur Jacob (master of the Carpenters' Company) occupied the chair. Professor T. Roger Smith, F.R.I.B.A., who succeeded the late Professor Banister Fletcher as chairman of the joint committee, stated that the individual students attending the school during the year numbered 309. This was the largest number that they had yet had, and was almost more than could be properly accommodated on the premises. Professor W. C. Unwin, F.R.S., distributed the prizes. At the same time he presented the certificates and medals gained at the Carpenters' Company's examinations in sanitary building construction, and in carpentry, and in the architectural and building construction classes at King's College, with regard to which a special report was read by Mr. Stanton W. Preston (clerk to the Carpenters' Company). Professor Unwin congratulated the successful students on having fitted themselves to face the problems of industrial life, and said that London was better off by something having been added to the capabilities of its workmen. The Great Titchfield-street School filled the gap between the technical school and the workshop, and he thought that the Carpenters' Company and the other City Companies concerned deserved great credit for providing the £1,600 per annum required to carry on the work there.

Mr. W. H. Lever has just purchased and presented to the Mayor of Bolton, on behalf of the town, the residence known as The Hall-i'-th'-Wood, the birthplace of Samuel Crompton, the inventor of the mule spinning frame. A combination of the spinning jenny by Hargreaves, and the water frame by Arkwright, the spinning mule was invented in 1775, and worked a marvellous revolution in the cotton-spinning world, making Bolton a most prosperous town. Samuel Crompton, who died in 1827, lived in comparative indigence. It was intended that a grant should have been given him by Parliament, and the matter was in the hands of Mr. Perceval to be brought forward in Parliament on the night that the Minister was shot in the lobby of the House of Commons by Bellamy. A statue was erected to the memory of Crompton, in Nelson-square, Bolton, in 1862. The original spinning mule made by Crompton is now in Mere Hall Museum, Bolton, and the corporation have also recently become possessors of several other relics of the great inventor.

Trade News.

WAGES MOVEMENTS.

The Skilled Labour Market.—The monthly memorandum of the Labour Department of the Board of Trade states that the state of employment during November continued good. The proportion of unemployed in the trade-unions making returns was 2·2 per cent., compared with 2·3 per cent. in October, and 2·3 per cent. in November, 1898. Employment in the building trades, though still good, is scarcely so active in some branches. The percentage of unemployed union members among carpenters and plumbers at the end of November was 1·5, compared with 1·1 in October, and also in November of last year. In the furnishing trades employment has remained steady, the percentage of unemployed union members at the end of November being the same as in October, and also in November, 1898—viz., 2·3.

Clyde Timber Trade.—In the Clyde district correspondents announce that trade continues good. Housebuilding, shipbuilding, and the furniture factories are all reported busy, and the sawmills are fully occupied. For pine and spruce the market is still very firm, and a fair amount of business is passing at the recent advances. Imports both at Glasgow and Greenock have been light for the week. At the latter place the joinery trade is reported rather slack.

* * *

The rural district council of Spilsby have increased the salary of Mr. T. A. Busbridge, their surveyor, from £200 to £250 a year.

Arrangements will shortly be concluded between the Brighton Railway Company and the Gordon Hotels, Ltd., under which the Grosvenor Hotel, recently purchased by the Brighton Company, will be entirely remodelled and brought up to date and opened for the next London season, under the administration of the Gordon Hotels, Ltd. The furnishing and decorations will be carried out by Messrs. Maple and Co. Important structural alterations, involving the closing of the hotel for three or four months, will be immediately undertaken under the supervision of Mr. Alfred Waterhouse, R.A., and Mr. Morgan, the Brighton Company's engineer.

LATEST PRICES.

IRON, &c.

	Per ton.		Per ton.
Rolled-Iron Joists, Belgian	£6 0 0	to	£6 10 0
Rolled-Steel Joists, English	8 5 0	„	9 0 0
Wrought-Iron Girder Plates	8 15 0	„	9 15 0
Bar Iron, good Staffs	8 7 6	„	9 7 6
Do., Lowmoor, Flat, Round, or Square	17 17 6	„	18 0 0
Do., Welsh	5 15 0	„	5 17 6
Boiler Plates, Iron—			
South Staffs	7 17 6	„	8 5 0
Best Snedshill	10 0 0	„	10 10 0

Angles 10s., Tees 20s. per ton extra.

Builders' Hoop Iron, for bonding, &c., £6 15s.

Builders' Hoop Iron, galvanised, £15 10s. 0d. per ton.

Galvanised Corrugated Sheet Iron—

	No. 18 to 20. Per ton.		No. 22 to 24. Per ton.
6ft. to 8ft. long, inclusive gauge	£14 10 0	...	£15 0 0
Best ditto	15 0 0	...	15 5 0

	Per ton.		Per ton.
Cast-Iron Columns	£9 0 0	to	£9 15 0
Cast-Iron Stanchions	9 0 0	„	9 15 0
Rolled-Iron Fencing Wire	10 15 0	„	11 15 0
Rolled-Steel Fencing Wire	10 15 0	„	11 15 0
„ „ „ Galvanised.	14 0 0	„	20 0 0
Cast-Iron Sash Weights	5 17 6	„	6 0 0
Cut Clasp Nails, 3in. to 6in.	10 0 0	„	11 0 0
Cut Floor Brads	9 15 0	„	10 15 0

Wire Nails (Points de Paris)—

0 to 7	8	9	10	11	12	13	14	15	B.W.G.
12/-	12/6	13/-	13/9	14/6	15/6	16/6	18/3	20/3	per cwt.

Cast-Iron Socket Pipes—

3in. diameter	£6 17 6	to	£7 5 0
4in. to 6in.	6 15 0	„	7 0 0
7in. to 24in. (all sizes)	6 15 0	„	7 0 0

[Coated with composition, 2s. 6d. per ton extra; turned and bored joints, 5s. per ton extra.]

Pig Iron—	Per ton.
Cold Blast, Lilleshall	105s. to 110s.
Hot Blast, ditto	57s. 6d. to 62s. 6d.

Wrought-Iron Tubes and Fittings—Discount off Standard Lists f.o.b. :—

Gas-Tubes	62½ p.c.
Water-Tubes	57½ „
Steam-Tubes	56½ „
Galvanised Gas-Tubes	50 „
Galvanised Water-Tubes	45 „
Galvanised Steam-Tubes	40 „

	10cwt. casks. Per ton.		5cwt. casks. Per ton.
Zinc, English	£33 0 0	to	£34 0 0
Do., Vieille Montagne	34 10 0	„	35 15 0
Sheet Lead, 3lb. per sq. ft. super.	20 0 0	„	21 0 0
Pig Lead, in 1cwt. pigs	18 0 0	„	19 0 0
Lead Shot, in 28lb. bags	23 0 0	„	24 0 0
Copper Sheets, sheathing and rods	95 15 0	„	96 0 0
Copper, British Cake and Ingot	75 0 0	„	76 0 0
Tin, Straits	115 0 0	„	116 6 0
Do., English Ingots	119 0 0	„	120 0 0
Spelter, Silesian	20 5 0	„	20 10 0

TIMBER.

Teak, Burmah	per load	£11 10 0	to	£17 0 0
„ Bangkok	„ ...	11 0 0	„	15 10 0
Quebec Pine, yellow	„ ...	4 15 0	„	6 5 0
„ Oak	„ ...	4 12 6	„	6 15 0
„ Birch	„ ...	3 7 6	„	5 15 0
„ Elm	„ ...	4 2 6	„	4 7 6
„ Ash	„ ...	3 7 6	„	4 2 6
Dantsic and Memel Oak	„ ...	2 10 0	„	4 5 0
Fir	„ ...	3 0 0	„	4 0 0
Wainscot, Riga p. log	„ ...	2 12 6	„	4 10 0
Lath, Dantsic, p.f.	„ ...	4 10 0	„	5 10 0
St. Petersburg	„ ...	4 0 0	„	6 10 0
Greenheart	„ ...	7 15 0	„	8 0 0
Box	„ ...	7 0 0	„	15 0 0
Sequoia, U.S.A.	per cube foot	0 1 9	„	0 2 0
Mahogany, Cuba, per super foot 1in. thick		0 0 5½	„	0 0 7½
„ Honduras	„ ...	0 0 4½	„	0 0 6
„ Mexican	„ ...	0 0 3½	„	0 0 4
„ African	„ ...	0 0 3½	„	0 0 5
Cedar, Cuba	„ ...	0 0 4	„	0 0 4½
„ Honduras	„ ...	0 0 3½	„	0 0 3½
Satinwood	„ ...	0 0 10	„	0 1 9
Walnut, Italian	„ ...	0 0 8	„	0 0 7½
„ American	„ ...	0 2 3	„	0 4 6

Deals, per St. Petersburg Standard, 120—12ft. by 1½in. by 11in. :—

Quebec, Pine, 1st	£20 0 0	to	£27 0 0
„ 2nd	15 0 0	„	17 10 0
„ 3rd	9 0 0	„	11 0 0
Canada Spruce, 1st	9 10 0	„	12 10 0
„ 2nd and 3rd	8 15 0	„	9 10 0
New Brunswick	8 0 0	„	9 0 0
Riga	9 10 0	„	10 10 0
St. Petersburg	10 10 0	„	17 10 0
Swedish	11 0 0	„	18 0 0
Finland	9 10 0	„	11 10 0
White Sea	13 10 0	„	21 0 0
Battens, all sorts	5 0 0	„	16 0 0
Flooring Boards, per square of 1in. :—			
1st prepared	£0 10 0	„	£0 15 0
2nd ditto	0 9 6	„	0 12 0
Other qualities	0 6 0	„	0 11 0
Staves, per standard M :—			
U.S. ditto	£37 10 0	„	£45 0 0
Memel, cr. pipe	220 0 0	„	230 0 0
Memel, brack	190 0 0	„	200 0 0

OILS.

Linseed	per tun	£21 12 6	to	£21 17 6
Rapeseed, English pale	„ ...	24 10 0	„	24 15 0
Do., brown	„ ...	23 5 0	„	23 10 6
Cottonseed, refined	„ ...	19 15 0	„	20 5 0
Olive, Spanish	„ ...	35 5 0	„	35 10 0
Seal, pale	„ ...	21 0 0	„	22 0 0
Cocoanut, Cochin	„ ...	29 0 0	„	29 5 0
Do., Ceylon	„ ...	25 5 0	„	25 10 0
Palm, Lagos	„ ...	25 10 0	„	23 0 0
Oleine	„ ...	18 15 0	„	19 15 6
Lubricating U.S.	per gal.	0 6 8	„	0 7 0
Petroleum, refined	„ ...	0 0 6¼	„	0 0 6½
Tar, Stockholm	per barrel	1 6 6	„	1 6 6
Do., Archangel	„ ...	0 19 0	„	1 0 0
Turpentine, American	per tun	32 10 0	„	33 0 0

LIST OF COMPETITIONS OPEN.

Dunoon—East Bay Improvement	£100, £50, £25	J. Valrose Clery, Town Clerk, Dunoon	Jan. 31
Barnsley—St. Edward Church and Vicarage, Kingston-place	£50, £30, £20	Lancaster and Son, Church-street, Barnsley, Yorkshire	Feb. 12
Doncaster—Isolation Hospital (11 beds)	£25 (merged), £15	F. E. Nicholson, Solicitor, U.D.C. Offices, Doncaster	„ 28
Belfast—Assembly Hall and Central Offices	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast	Mar. 12
Walsall—Municipal Buildings (Assessor)	Five selected, £100 each	John R. Cooper, Town Clerk's Office, Walsall	„ 31
Harrogate—Northern Police Convalescent Home		The Hon. Secretary, St. George's, Harrogate	—
Glasgow—General Hospital (1,200), Stobhill Estate, Springburn	£200, £150, £100, £50	Jas. R. Motion, Parish Council Chmbrs., 38, Cochrane-st., Glasgow	—

LIST OF TENDERS OPEN.

BUILDINGS.

Rastrick—Rebuilding Junction Inn	Halifax Brewery Co.	W. Clement Williams, Architect, 29, Southgate, Halifax	Dec. 23
Lifford—Alterations to County House	Donegal County Council	J. R. A. Ferguson, M.E., County Surveyor, The Rock, Londonderry	„ 23
Middlesbrough—Shops, &c.		Robt. Moore, Architect, 27, Albert-road, Middlesbrough	„ 23
Cammachmore—House	Miss Campbell	Walker and Duncan, Architects, 3, Golden-square, Aberdeen	„ 23
Whitby—Two Shelter Seats	Urban District Council	Thos. Keat Scott, Surveyor, Flowergate, Whitby	„ 23
Bradford—Warehouse and Shed, Crossley Hall Dyeworks		J. W. C. Atkinson, Architect, 1, Ivegate, Bradford	„ 23
Cardiff—Receiving and Lunatic Wards at Workhouse	Guardians	Edwin Seward, F.R.I.B.A., Queen's Chambers, Cardiff	„ 23
Barry—Offices	School Board	George Thomas, F.S.I., Architect, Queen's Chambers, Cardiff	„ 23
Ovenden—House and Stable		Jackson and Fox, Architect, 7, Rawson-street, Halifax	„ 23
Rawmarsh—Mixed School, South-street	School Board	J. Platts, Architect, Old Bank Buildings, High-street, Rotherham	„ 23
Bangor, Co. Down—Hotel		James G. Lindsay, Architect, 1, Glengall-place, Belfast	„ 23
Gainsborough—House at Waterworks	Urban District Council	Percy Griffiths, A.M.I.C.E., 54, Parliament-street, Westminster	„ 23
Rochford—Two Cells and Shed at Workhouse	Guardians	Frederic Gregson, Clerk, Alexandra-street, Southend	„ 23
Halifax—Pair of Semi-detached Villas, Moorside Estate		Richard Horsfall and Son, Architects, 22A, Commercial-st., Halifax	„ 23
Barry—School Board Offices	School Board	George Thomas, Architect, Queen's Chambers, Cardiff	„ 23
Glasgow—Extension of St. Enoch Station	Glasgow and South-Western Ry. Co.	F. H. Gillies, Secretary, St. Enoch Station, Glasgow	„ 25
Falkirk—Five Double Cottages, Mungalhead-road	Falkirk Building Society	Thomas M. Copland, Architect, 87, High-street, Falkirk	„ 25
Blackburn—Two Warehouses		Cheers and Smith, Architects, 24, Richmond-terrace, Blackburn	„ 27
Wellingborough—Corridor and Bathroom at Workhouse	Guardians	Sharman and Archer, Architects, Wellingborough	„ 27
Braemar—Isolation Hospital	Deeside District Committee	Jenkins and Marr, C.E. and Architects, 16, Bridge-st., Aberdeen	„ 27
Upper Holloway, N.—Chimney Shaft, St. John's-rd. Workhouse	St. Mary, Islington, Guardians	William Smith, Architect, 65, Chancery-lane, W.C.	„ 28
London, E.C.—Artisans' Dwellings, Plumbers-pl. Area, City-rd	Shoreditch Vestry	Rowland Plumbe, F.R.I.B.A., Architect, 13, Fitzroy-square, W.	„ 29
Bramley—Five Houses, Hough-lane		William Shackleton, Architect, 2, Somerset-road, Pudsey	„ 29
Walthamstow—Rustic-Work Bandstand, Forest-road	Urban District Council	G. W. Holmes, A.M.I.C.E., Surveyor, Walthamstow	„ 29
Kendal—Shelter, Abbot Hall Recreation Ground	Town Council	R. Hampton Clucas, M.S.A., Boro' Surveyor, Town Hall, Kendal	„ 29
Carlisle—Factory, London-road	Jos. Tiffen	H. H. Hodgkinson, Architect, Scotch-street, Carlisle	„ 29
Embleton—Renovations to Paradise	Mrs. Benson	M. Temple Wilson, A.S.I., Architect, Alnwick	„ 30
Thrapston—Infirmary at Workhouse	Guardians	Blackwell and Thomson, Architects, Parkstile Chambers, Kettering	„ 30
Devonport—Demolition of Old Bear Creek Oil Store		The Borough Electrical Engineer, Technical Schools, Devonport	„ 30
Newcastle-upon-Tyne—Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, F.S.A., Archt., 37, Grainger-st., Newcastle-on-Tyne	„ 30
Aberystwith—Two Villas, Llandabarn-road	Thomas Owen	J. Arthur Jones, Architect, 7, Queen's-terrace, Aberystwith	„ 30
Donington—Tool-House	Parish Council	A. G. Fletcher, Clerk, Donington	„ 30
Morecambe—Villas and Stables, Grove-street	Mrs. Emary	A. Lancelot Lang, Architect, 12A, Pedder-street, Morecambe	Jan. 1
Cardonagh—Station Buildings	Londonderry & Lough Swilly Ry. Co.	Fred. Dawson, Secretary, Shipquay-street Buildings, Londonderry	„ 1
Thrapston—Additions to Woodford House		Wilfred Plevins, Woodford House, Thrapston	„ 1
Belper—Enlarging Manual Workshop	School Board	Hunter and Woodhouse, Architects, Belper	„ 1
Glasgow—Extensions to Whitevale Tramways Depot	Corporation	John Young, General Manager, 88, Renfield-street, Glasgow	„ 2
Ashton-under-Lyne—Shops, &c., Old-street		George and Son, Old-square, Ashton-under-Lyne	„ 2
Oldham—Public Baths, Hathershaw	Corporation	S. A. Pickering, A.M.I.C.E., Boro' Surveyor, Town Hall, Oldham	„ 2
Borough, S.E.—Strengthening Floors at Stores, 4, Mermaid-ct.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk H., Norfolk-st., Strand, W.C.	„ 3
Cilybebyll—Isolation Hospital	Pontardawe Hospital Committee	John Morgan, Surveyor, Herbert Chambers, Pontardawe	„ 3
Bessingby—Additions to Farmhouse		J. Earnshaw, M.S.A., Architect, Carlton House, Bridlington Quay.	„ 4
Streatham Hill, S.W.—Additions to St. Anne's Home	St. Pancras Guardians	Salter, Issott, and Salter, Archts., 13, Phœnix-street, St. Pancras	„ 4
Hoxton, N.—Costermongers' Stalls, Nile-street	Shoreditch Vestry	J. Rush Dixon, A.M.I.C.E., Engineer, Town Hall, Old-street, E.C.	„ 4
West Hampstead—Branch Public Library, Westbere-road	St. John's Vestry	Arthur P. Johnson, Vestry Clerk, Haverstock Hill, N.W.	„ 4
Bridlington Quay—Dwelling Houses, Bessingby Estate	A. G. W. Wright	J. Earnshaw, M.S.A., Architect, Carlton House, Bridlington Quay	„ 4
Chapel-Saint-Leonards—Rebuilding Primitive Methodist Chapel		D. Crow, Farmer, Chapel-Saint-Leonards	„ 4
Whitley—Council Offices, Fire Brigade House, and Stores	Whitley and Monkseaton U.D.C.	J. P. Spencer, A.M.I.C.E., 13, Grainger-st. West, Newcastle-on-T.	„ 5
Birmingham—Additions to Coachman's House at Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	„ 6
Swindon—Additional Hospital Buildings	Swindon and Dis. Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	„ 6
Oswestry—Market Extension	Town Council	G. William Lacey, C.E., Borough Engineer, Guildhall, Oswestry	„ 8
Eastbourne—Bandstand, Grand Parade	Pleasure Grounds Committee	R. M. Gloyne, A.M.I.C.E., Boro' Engineer, Town Hall, Eastbourne	„ 8
Liversedge—Millbridge Upper School	School Board	Alfred E. Rhodes, Architect, Cemetery-road, Heckmondwike	„ 9
Llangollen—Alterations and Additions to Courthouse		The County Surveyor, Denbigh	„ 9
Preston—Post and Inland Revenue Offices	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	„ 10
Heamoor—School	Madron School Board	Oliver Caldwell, F.R.I.B.A., Penzance	„ 10
London, S.E.—Disinfecting House at Lambeth Infirmary	Lambeth Guardians	S. R. J. Smith, Archt., 14 and 15, York Buildings, Adelphi, W.C.	„ 10
Kilkeel—Masonic Hall		R. B. Wray, Kilmorey Arms Hotel, Kilkeel, Ireland	„ 10
Grimsby—Workhouse Extension	Guardians	Herbert C. Scaping, Architect, Court Chambers, Great Grimsby	„ 15
Birkenhead—Electricity Generating Station, Craven-street	Corporation	C. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	„ 16
Chadderton—County Police Station and Courtroom	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	„ 16
Willesden—Foundations, &c., for Infirmary, Acton-lane	Guardians	A. Saxon Snell, F.R.I.B.A., Southampton Bldgs., Chancery-l., W.C.	„ 17
Kentish Town, N.W.—Public Baths and Washhouses	St. Pancras Vestry	T. W. Aldwinckle, F.R.I.B.A., Architect, 1, Victoria-street, S.W.	„ 26
Sunderland—School Buildings, High Barnes Estate	School Board	T. W. Bryers, Clerk, Sunderland	„ 29
Hemingfield—House and Stable		John Robinson, Wombwell	—
Cloughton—Cottages	H. E. Donner	Charles Edeson, Architect, 5, Huntriss-row, Scarborough	—
Walham Green, S.W.—Block of Flats		Albert G. Hastilow, Architect, 104, Upper Richmond-road, Putney.	—
Southerdown—Additions to Marine Hotel	R. T. Davis	Seddon and Carter, Archts., Bank Buildings, St. Mary-st., Cardiff	—
Horwich—Enlargement of British Schools, Lee-Lane		E. W. Dyson, Architect, 17, Lee-lane, Horwich	—
Cambridge—Corrugated Shed (40ft. by 80ft.)		Pamplin Bros., Cherry Hinton Works, Cambridge	—
Rawtenstall—Showrooms, &c.	Eastwood and Clegg	F. Hobson, Architect, Burnley-road, Rawtenstall	—
Farsley—Eight Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Sheffield—Works, Buildings, &c., Walkley-lane	G. A. Milne	Henry Webster, Archt., St. Mary's Chmbrs., Norfolk-row, Sheffield	—
Whalley Range—Presbyterian Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Belfast—Improvements to Licensed Premises, Roden-street	A. and D. Rooney	W. J. Moore, Architect, Whitehall Buildings, Ann-street, Belfast	—
Muckamore—Repairing and Ventilating Presbyterian Church		J. Hawthorne, Dunadry	—
Rawtenstall—Bakery and Stables	Hartley and Co.	F. J. Hobson, Architect, King-street, Rawtenstall	—
Donhead St. Andrew—Reroofing South Aisle of Church		W. E. King, Donhead Lodge, Salisbury	—
Llanfairfechan—Shop Premises and House	Peter Jones	Richard Hall, Architect, Bangor	—
Rawtenstall—Alterations to Bishop Blaize Hotel		John Baxter, Limited, Glen Top, Waterfoot	—
Carlisle—Cookery School, Ashley-street	School Board	T. Taylor Scott, F.R.I.B.A., Architect, 43, Lowther-street, Carlisle.	—
Long Eaton—Five Shops		Ernest R. Ridgway, M.S.I., Architect, Long Eaton	—
Bromsgrove—Four Cottages	Highways Committee	Hope House, Kew Green	—
Leeds—Two Through Dwelling-Houses, Frankland-terrace		A. Philpotts, 5, Leopold-road, Leeds	—
Gisburne—Dining-Room, &c., Commercial Hotel	John Green	Thos. Bell, Architect, 14, Grimshawe-street, Burnley	—
Arbroath—Slaughter-Houses		Hugh Gavin, Architect, Arbroath	—
Styrrup—Rebuilding White Swan Inn	Worksop & Retford Brewery Co.	Vallance and Westwick, Archts., White Hart Chambers, Mansfield	—
Bradford—Three Through Houses in Chesham-street		R. Drake, Architect, 142, Allerton-road, Allerton	—
North Shields—Business Premises, Saville-street	Isaac Black	Hope and Maxwell, Architects, Trinity Buildings, Newcastle-on-T.	—
Ashington—Schools at New Hirst		The Secretary, Colliery Office, Ashington	—
Southend-on-Sea—Nelson Hotel, Prittlewell	Joseph Berry	Greenhalgh & Brockbank, Archts., Bank Chmbs., Southend-on-Sea	—
Great Yarmouth—Four Houses, Alderson-road		21, Howard-street South, Great Yarmouth	—
Hunslet—Four Houses and Shops, Jack-lane	John Hollings	W. Mason Coggill, Architect, Beach-grove, Stourton	—
New Shoreham—Releading or Slating Chancel Roof		F. C. Pilmore, Parish Warden, 3, Western-road, New Shoreham	—
Denby Grange—Twenty Beehive Coke Ovens		F. H. Waterhouse, Mngr., Denby Grange Collieries, near Wakefield	—

ENGINEERING.

Blackburn—Overhead Line Equipment	Corporation	Lacey, Clirehugh, & Sillar, Engineers, 2, Queen Anne's-gate, S.W.	Dec. 23
Morley—Sinking Well	Sewage Purification Committee	W. E. Putman, Borough Engineer, Town Hall, Morley	„ 27
Gloucester—Electrical Plant	Electricity Supply Committee	Robert Hammond, M.I.C.E., Engineer, 64, Victoria-street, S.W.	„ 28
Wigston—Concrete Carrier, &c.	Urban District Council	The Surveyor's Office, 32, Bell-street, Wigston Magna	„ [illegible]
Hull—Plant, Sculcoates-lane Electric Lighting Works	Electric Lighting Committee	T. G. Milner, City Treasurer, Town Hall, Hull	„ 28
Twickenham—Machinery, &c., Mogden Isolation Hospital	Joint Isolation Hospital Committee	F. C. Greville-Smith, Clerk, 172, High-street, Hounslow	„ 29
Panama—Aqueduct		The Commercial Dept. of the Foreign Office, Whitehall, S.W.	„ 30

THE BUILDING NEWS
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THE RENAISSANCE IN AMERICA AND ENGLAND.

LATELY there have been indications in the architectural world that the developments of our everyday building art is not all that can be desired. We have lately discussed the opinions of some leaders of what go by the names of Gothic and Renaissance amongst us, each attempting to prove, and with much reason, that both these developments are capable of subserving our wants, if they are not pressed to a literal rendering of those once logical and national styles. Everyone can now see that for the last 200 years or more we have been mistaking representative or imitational for real living architecture. We need only now allude to the papers read by Mr. Basil Champneys at Manchester, and by Mr. W. Emerson at the Institute of British Architects, which deal with this subject from rather different points of view, though practically arriving at the same conclusion—that we possess in these two great developments of architecture all the elements of a truly national expression, without going out of our way to introduce any so-called new style.

A paper by Mr. Ralph Adams Cram, of Boston, read at the Annual Convention of the American Institute of Architects at Pittsburgh last month, on the influence of the French School on American architecture is interesting, as showing that our friends across the Atlantic are seriously taking stock of the number of architectural "dispensations" they have had during the last half-century. Three or four distinct revivals have taken place. There was the "Queen Anne," the Romanesque, and later the "Colonial excitement," the latter being a more national development, arising out of historical associations, or, as Mr. Cram says, ethnical continuity. Lastly, the "Parisian Renaissance of the Boulevards" has been imported, and to this style the author devotes his chief attention. Each of these styles were enthusiastically received. The first three have passed away as mere fashions, and the author asks if this is to be the fate of the latest that "we have imported with our champagne and Easter millinery." It is admitted that there was some good in them. The Queen Anne craze, we are told, served the part of the swallow of salt water in the case of sea-sickness—it prepared the system. Romanesque gave us some idea of what vigour and power and honesty meant in our work; Colonial suggested the value of historical continuity; and the Parisian Renaissance, it is thought, will do more good than any of the others. But is it the revelation of all truth—"the last word in our architectural development"? Mr. Cram, while admitting the good these studies in styles have left, says, "In time we shall come to discriminate between what is permanent and what is evanescent in the movement." We take both—we accept the letter of the style as well as the spirit. The motive is good, the style bad. Our American brethren are beginning at last, like ourselves, to see the underlying principles of these systems, and to appraise at a lower value the style itself—the mere accidents of form and detail. It is this sense of fundamental law in architecture that has come over the dream of American work, and is gradually supplanting the æsthetic anarchy that has till now prevailed. We in England have also yet to learn self-restraint—the subordination of personality to "something that is larger than the individual." We have hardly yet got out of the chaos which our desire to introduce new styles and to follow leaders of fashion has led us into. We must admit also the force of the indictment that "our architectural education has been (till lately) primary, not even rudimentary." Architects and artists in all the crafts have been content to teach all that pertains to certain styles and periods, to outside matters, to instruct students in correct drawings of Greek, Gothic, and Renaissance, to observe closely the rules of orders and ordinances, of decoration, the principles and detail in designing churches and palaces of the 13th and 15th century, to award prizes and medals for the most complete copies; but as to the rudimentary questions of plan, good construction and composition, hygienic rules, and a hundred other matters, our students are still left to find out for themselves. Our masters and our schools are no doubt correcting this mistake; rudimentary subjects are taught in them, but yet in a kind of fragmentary and inconclusive manner, as we have often shown in these pages. We must recur to rudiments as the basis of all style worth anything if we are to show real progress in art; such, for example, as those questions relating to materials, plan, and construction, not taking them exclusively from books, but from individual efforts to master their proper natural relations to any particular building. The author, speaking of the architectural reform in America—the craze for the Parisian style—writes: "This is the phase of the new *régime* that I must protest against, not the big principles of planning, composition, and design, not even the methods of teaching these, but the narrow enthusiasm that confuses a cheap and facile style with principles that are really fundamental. If the advocates of the new school would only take their stand on the really unassailable principles that drive them, instead of in the casual style that happens to be associated with them for the moment, there could be no chance for a quarrel. Only too often they do not do this, as is proved by the fact that the public believes that the style of the Parisian boulevards is the end and aim of the whole movement. It is unfortunate that this most salutary movement should be linked with a style so limited and so superficial. France is the only European country where there is a logical system of training, and France has preserved the style of the Renaissance with more vitality than it has been elsewhere. In England, Germany, America, it was quite dead, though, unfortunately, unburied." There is a good deal of truth in this argument. In France the new scholasticism has helped to keep the style alive; in America it has been galvanised into life, but we do not think this is quite true as regards England. The style made a deep impression here; it took root, and became a national growth, though mixed with Tudor during the Elizabethan, Jacobean, and 17th-century periods. Such examples as Holland House, Brownshill, Audley End, Kirby Hall, Hatfield, are surely evidences that Renaissance found a home in England. In America it did not. There has been no progressive movement, as with us, from the 16th to the early 18th century; the style has never taken a deep root. We cannot boast of the work executed in France during the reign of Francis I., such as the Château de Blois, the grand escalier for instance, or the Château de Chambord, the Palace at Fontainebleau, or the Louvre, or that at Versailles—all of which are imbued with the true spirit of the style. We lost the thread when we began to import foreign versions of Classic at a later date, when we abandoned our national Gothic planning and substituted Classic models. Imitation, or affectation, has no doubt been more regarded than principles of design; indeed, whatever may be said of later revivals of Renaissance in England and America, we cannot say the same of that of France. The style has adapted itself to the many changes and vicissitudes of the Empire, and we can endorse the remark that "the Parthenon would be grotesque in Paris; Garnier's Opera House is admirable." The Renaissance of the boulevards expresses the time, the people, and the civilisation. "Therefore," says Mr. Cram, "it is a thousand times more respectable than the archæological Gothic of the 13th century pasted over the outside of the English Law-courts, or the barbaric solemnities of the Auvergne when they try to express 19th-century Protestantism." While admitting that the style is not well chosen, we must allow that Street's great edifice is masterful in plan and structural expression. It is not the servile imitation of any one historic building, as the older revivalists' work was. We see the master's mind through the work, not hidden behind a mask; the details of the style, if unhappily chosen, are there, but used and adapted with some fitness, so that it cannot fairly be said that the Gothic of the 13th century "is pasted over the outside." As true would it be to say that our Houses of Parliament are hidden under a Tudor mask. We have, in fact, to discriminate between a servile imitation of a style that moulds the plan and structure, and the *use* of a style with which we express them; between a bare copy of a Greek temple or Renaissance palace on the banks of the Thames or the Seine and a well-planned building designed after Classic models. The two things are very different. An author may translate his thoughts into a foreign language; but he cannot copy another foreign author's thoughts as his own. Our American critic appears to ignore the distinction. As to the latter part of the sentence we have quoted, all we need say is that our churches are better expressed than our secular buildings. But for accidents of time and country, doctrine and ritual, religion is the same, and the style of Auvergne is not unsuited for an Anglican church in many localities.

Our American author dwells on the fact that in the past one style has been enough for any given time and people. No doubt if we could invent a new national style sufficiently elastic for our purpose, there would be no reason why our age should not be represented by one style. At present it seems impossible, and, as the author says, architecture, if it is real, must accurately express the impulses without, and we have "not one impulse, but a hundred." Many units compose our modern complex society; our ideas are as various and conflicting as they well can be—we have no dominant creed, religious or political. In these circumstances it is useless to expect any uniformity of expression. The vital error of the advocates of the Parisian Renaissance is based on the diversity of these tastes. "They try to force an alien style on us for all our uses," says the writer, "when really it fits only a few of them." The absurdity of this revival in a country that is Engish in sentiment and sympathy is pointed out, though there is much in American or New York Society which can be better expressed in the French style than any other. As republics, there is a common bond of sympathy between the two nations. On other grounds the style does not adapt itself. It does not adapt itself to the commercial or religious side of American life; certainly it cannot be used with any effectiveness on the "sky-scrapers," tenement houses, and institutions. It is noteworthy in this connection to quote what is said about church architecture as showing how improved the tone of American taste is. In answer to the question what style shall be employed, the writer says: "There the answer is the splendid Gothic that Bodley and Sedding, and Austin and Paley, and their associates have restored to life and vigour." This may be a flattering, but not exaggerated, statement. On the other hand, he ridicules the style of the church on Montmartre as artificial, affected, and anomalous, as it is a mixture development of French Renaissance and the buildings of the South of France. Nor does the writer say much for the designs submitted for the Cathedral of St. John, New York, which are called hopeless and devoid of religious feeling.

We can only briefly here allude to the contribution of Mr. H. Langford Warren, of Boston, to the same convention. Much more hopeful is this critic as to the strong French influence which is dominating architects in America. He discusses how far it is a source of danger to be avoided, as well as some of its better qualities. The facts of the history of architecture in America for the last century are narrated. The rival claims of Greek and Gothic produced a chaotic condition; the earlier period was in the hands of simple craftsmen, who carried on the tradition of the Colonial period. The want of cultured and trained practitioners in the first half of the century led to a deplorable state of art, and the public taste was vitiated. "Shoddy commercialism and vulgar and meretricious shams" predominated in America. Then the architectural fashions of England were parodied. We all knew the designs at this early period. Up to the middle of the century French influence had not appeared. After this English and French training and taste effected a change; high roofs were introduced, and one of the leaders was Mr. Richard M. Hunt, who was the first educated at the Ecole des Beaux-Arts. To his systematic academic training and his own vigorous personality, as we all know, American architecture owes much. At Mr. Hunt's artelier at New York many leading American architects were trained. From this time the education of the profession was based on the Paris school. Professor Ware, M. Eugene Létage, and others of the Massachusetts Institute helped on the movement, and now the leading American architects number many who have graduated at the great French school. While this writer acknowledges that America owes an enormous debt to France in this respect, and the fine qualities of French architecture, he points to the extravagance, redundance, and theatrical display of ornament, which injures many of its finest productions. This phase of *fin de siècle* decadence, he says, truly has made itself felt in the designs of the Paris Exposition, "which, magnificent as it is in conception, is producing structures almost delirious in their unreasonable and wanton ugliness." Proceeding to dwell on the better qualities of French work, Mr. Warren refers to the restraint of the Ecole twenty years ago, the fundamental principles it inculcated, especially composition, proportion, and monumental planning. Fenestration, light and shade, effective placing of ornament, and rhythmic proportion were qualities it promoted. The training insisted that a building must express its plan and tell its story; plan and elevation must work together to produce one organic whole. Architecture must possess fundamental laws. Unreasoned revolt against all these principles and restraints has led to license, capricious novelty, *bizarrerie*, and theatrical posturing. The importance of training and discriminating studies are essentials, and students should not come under the influence of French architecture until they can think and discriminate for themselves. Architecture must solve its problems in its own way, and express its own ideals before it attempts to copy those of any other country. French art has grave defects as well as great qualities; over-admiration for French models is the admitted danger. Both these exponents of the situation practically come to the same conclusion: they both recommend an independent study of fundamental principles of this particular phase of the Renaissance—a finding out in an independent way of their own problems and ideals. It is unnecessary here to dwell on what these are.

One of the permanent principles that underlie the great styles is the right use and development of materials, plan, and construction. In all the great historic periods the harmony of these things was prominent. Materials were rightly used and applied, and there was a definite and distinct relation between plan and structure. To mention only the latter, what we may briefly call "plan development," how little has it been considered by us or our American brethren! The style has been the all-absorbing thought—how to dress a building with garments of other ages than our own. Only a few have been honest or bold enough to develop plan and give it external expression. Renaissance and Gothic both exhibit in their best and purest periods plan-development, by which we mean the arrangement of a building developed externally by horizontal dimension through prominent proportions and recesses, or by that structural accentuation imparted by varying heights and roofs. Plan and elevation were considered as parts of an organic whole, one the natural expression of the other. These were the fundamental principles of every great development. Nor can we hope to recover them from the chaos of our late revivals and our slavish adherence to mere style till we begin to study our architecture from the initial qualities of honest building and rightful aim.

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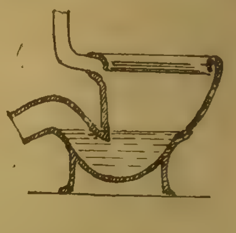
ESTIMATES.—XXXVI.

SANITARY FIXTURES — LAVATORIES, WASTE PREVENTERS, ETC.

LAVATORIES, sinks, waste-water preventers, closet apparatus, baths, &c., are items which are best described by reference to a manufacturer's catalogue giving description, name, or number. The various forms of closets alone require a special study. After the hopper forms, the wash-down is perhaps the simplest and best for ordinary use, and is an improvement on the short hopper closet. It can be made in one piece with siphon trap or in two pieces, the lower being the trap. The latter admits of repair of the pan. It is made in the pedestal form without casing of wood. Fig. 1 shows a closet of this form. The trap is a P trap, and the outgo is arranged so that the joint is under water. One principal point to consider is the connection between the earthenware trap and lead soil-pipe, and the London County Council regulations ought to be observed—namely, to form a socket on the lead-pipe. A brass ferrule fits on this, as we have shown, and molten solder is poured round the joint and "wiped." The brass ferrule is jointed to the earthenware by a ring of gaskin and finished with neat cement run in. No. 2 represents a "valve" closet, which is considered one of the best, but more complex in arrangement. The one shown is Messrs. Dent and Hellyer's "Optimus" valve closet, which consists of the basin, valve, and lead anti-D trap. This closet, as will be seen, has a large water area and a double water-seal, besides a close-fitting valve; a 2in. vent pipe is taken from valve-box to outside of wall. Many useful wash-down closets are in the market. Amongst these we may mention Doulton's "Simplicitas" of glazed ware, Hellyer's patent "Hygienic" with lead anti-D trap (see sketch 3), a closet well suited for upstairs use and for connecting to lead soil-pipe by a wiped solder joint. The price of this closet is £1 1s. No. 4 represents the same closet, with improved jointing, *b*, for connection with drain. This joint can always be seen. The price is about the same. No. 5 shows the "Isis" wash-down closet with lead trap, made in accordance with the London Sanitary Authorities, by Nicholls and Clarke, Shoreditch. It is made in two pieces of earthenware or with a lead trap, as shown. The joint *c* is very efficient. One of the best possible means of jointing to a lead soil-pipe is a "wiped" joint. This closet is moderate in price, has a good water surface and seal, and permits a thorough flushing of trap. The price is 18s. 9d., with S lead trap. Twyford's "Unitas" washout closet and trap in one piece is also an excellent and cheap closet, from £1 12. For particulars see catalogues of Messrs. Doulton, Dent and Hellyer, Duckett and Son, Limited, Twyford, Limited, and other well-known firms.



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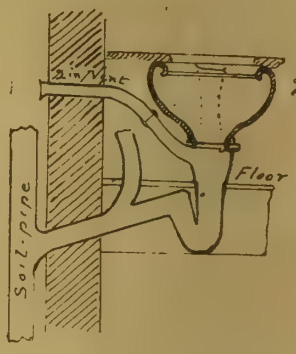

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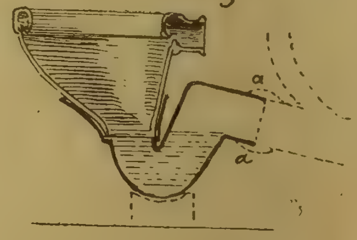

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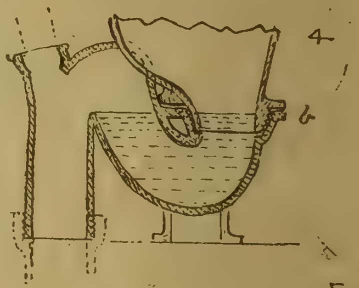

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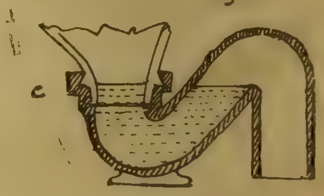

FITTINGS: CAST-IRON PIPES, ETC.

No. 5. ¾in. screw-down bib valves (best quality) with screw ferrule.

These are worth about 4s. 6d. each, and fixing, say, 2s. 6d.

No. 3. ½in. bib valves with screw ferrules.

Price in Nicholls and Clarke's catalogue 1s. 9d. each.

No. 2. ¾in. ditto, screwed for iron, for scullery.

Price 2s. 10d.

No. 1. "Lord Kelvin's" patent ¾in. bib-tap, with screwed end for iron.

This is priced in the above list at 6s. 6d.

38ft. run. 6in. cast-iron socket and spigot pipes laid in concrete under building and fixing, the metal to be ½in. thick.

These would weigh per 9ft. length about 2cwt. 3qrs., and would cost about 19s., or 6s. 4d. per yard.

	£	s.	d.
Cost of pipe per yard	0	6	4
Materials, yarn, fixing, &c.	0	1	0
Labour laying, filling trenches	0	1	6
Including digging and filling trench	0	8	10

No. 2. Cast-iron branches to ditto.

These will weigh about 2cwt., and would be worth 15s. per cwt., or 30s. each.

No. 1. 4in. junction with socket for closet to cast-iron soil-pipe and fixing; 18in. length of arm.

Price at 6s. 2d., and joints 2s. each, or 10s. each junction. If of London County Council weight, the cost of junction and socket will be 6s. 8d.

SINKS.

Provide and fix a fireclay enamelled sink fixed on strong brackets, 36in. by 22in. by 10in.

Sinks are made in cast iron, enamelled iron, earthenware, heavy glazed fireclay from £1 5s. to £3 or more.

Messrs. Doulton and Co., Duckett and Son, Ltd., and Dent and Hellyer make excellent sinks of earthenware, fireclay, &c.

	£	s.	d.
Cost of sink, say	2	10	0
Brackets	0	3	6
Overflow and fixing	0	7	0
	3	0	6

Glazed fireclay sinks, 36in. by 24in. by 7in. deep, can be had for 22s. to 32s. Nicholls and Clarke supply a glazed fireclay sink, enamelled inside and out, with back and end skirting, of the size given in this item for 73s. to 84s. (See their catalogue under Sinks.)

Fix in pantry an enamelled fireclay sink and drainer (36in. by 21in. by 9½in.), with overflow, plug, and washer; drainer with wood top, soap-tray, hot and cold valves, on pedestals, complete.

This is a superior fitting, and may be priced at £6; pedestals, say 25s.

No. 1. Cast-iron enamelled sink, 24in. by 14in. by 7½in. deep, with brass plug, &c.

Worth about 25s.

	£	s.	d.
Cost of sink	1	5	0
Brackets	0	3	6
Waste	0	2	6
Fixing	0	3	0
	1	14	0

LAVATORIES AND FITTINGS.

Fit up range of 3 white enamelled fireclay lavatory basins, with soap-trays drained into basins, screw-down brass taps, ½in., hot and cold, brass plugs and washers, 1in., with union, with chain and stays to each basin, and four cast-iron wall-brackets, waste-pipes, and connect to soil-pipe. Range, 6ft. by 18in.

This range of lavatory basins and fittings, &c., will cost about £6.

	£	s.	d.
Cost of range	6	0	0
Channel for waste	1	2	6
Fixing and connecting, say	0	10	0
	7	12	6

No. 3. Angle porcelain-enamelled, cast-iron lavatories, 23in. width, basin, 15¼in. by 12¾ft., with overflow, complete.

These may be priced at 28s. each. Add to this labour connecting overflow and waste.

No. 2. Fit up Doulton's plain, cabinet-top lavatories, with skirting 15½in. by 16in., and 12in. basin.

These are priced at about 10s. each, say—

	£	s.	d.
Cost of lavatory	0	10	0
No. 3 cast-iron brackets for ditto	0	10	0
Galvanised	0	7	0
Labour fixing, &c.	0	10	0
	1	17	0

Provide and fix No. 1 of Twyford's "Ideal" lavatory basin in office.

This costs from 28s. to 30s. Add fixing, say, 6s.

Ditto 1 Jenning's "tip-up" basin, with polished marble top for lavatory.

Say from £6 to £7 complete.

Ditto 2 ditto, enamelled slate top, in office.

These are priced at £4 4s. each, exclusive of fixing and iron bearers.

	£	s.	d.
Cost, say	4	0	0
Cold-water valve and iron bearers	0	10	0
Fixing	0	5	0
Per basin	4	15	0

WASTE PREVENTERS.

Fit up complete in servants' closets No. 3 2-gallon approved pattern water-waste preventers of galvanised cast iron, with best ball valve overflow, union and cover.

These are of various prices, and range from 12s. to £2 10s. or £3. It is desirable to mention patent or maker's name. Those made and supplied by such firms as Messrs. Doulton, Dent and Hellyer, Nicholls and Clarke, have a good reputation. A very good cast-iron 2-gallon siphon preventer may be had for £1.

	£	s.	d.
Cost of preventer	1	0	0
Cast-iron brackets	0	3	0
Connections and fixing	0	12	6
	1	15	6

Fit up complete in ground floor closets No. 2 galvanised 3-gallon siphon silent water-waste preventers, on brackets, pull, and chain, &c., and making connections.

	£	s.	d.
This may be priced at about	1	17	0
6ft. run 1¼in. lead flush-pipe to closet, including joint and fixing, with lead tacks soldered to pipe at, say, 1s. 4d.	0	8	0
3ft. run ½in. lead supply pipe at 7d.	0	1	9
No. 2. ½in. soldered joints at 9d.	0	1	6
No. 2. 1¼in. ditto, at 2s.	0	4	0
1ft. 9in. ¾in. overflow from W.W. preventer carried through wall, say	0	2	0
	2	14	3

Refix old waste-water preventer complete, with 5ft. run, 1¼in. flush pipe to closet, two soldered joints 1ft. 9in. run, ¾in. overflow, and 6ft. run of ½in. supply, joints, &c.

These items may be priced thus—

	£	s.	d.
5ft. run 1¼in. flush-pipe at 1s. 4d.	0	6	8
Two soldered joints at 2s.	0	4	0
1ft. 9in. run, ¾in. overflow at 1s.	0	1	9
6ft. run ½in. supply and joints at 7d.	0	3	6
	0	15	11

CLOSETS AND WASTE PREVENTERS.

Fit up complete for servants' use No. 1 a straight-back wash-down pan and trap, the latter with flange joint for basin, in two pieces of earthenware, cane and white.

This closet is priced in Nicholls and Clarke's list at 5s. 9d.

	£	s.	d.
Cost of closet	0	5	9
Labour fixing and making connections, say	0	14	0
	0	19	9

Provide and fix a strong galvanised 3-gallon cast-iron siphon waste-preventer of approved make, with chain pull complete to ditto, and making connection with closet.

Many simple and efficient waste-preventers are sold. The "Premier" (Nicholls and Clarke) costs, galvanised, 25s., with pull complete; the "Acme" patent siphon preventer costs 31s.

	£	s.	d.
Cost, say	1	5	6
1½in. lead flush pipe from preventer, and joints, 10ft. run	0	12	6
½in supply pipe to ditto, 5ft.	0	8	0
Overflow, &c.	0	2	6
	2	3	6

If these connections are the same as in the previous item, these may be deducted.

Fit up complete two approved fireclay closets, white glazed inside, buff outside, in basement.

These closets may be had from about £1 10s. to £2. Joseph Cliff and Sons, Waterloo Bridge, supply various kinds of fireclay closets, such as the "Titan," the "Kenon."

	£	s.	d.
Cost of closet	1	12	0
Fixing, labour, and material	0	10	0
	2	2	0

No. 2. 1½in. lead ventilating pipes from trap carried through outer wall, 3ft. long each.

These would cost about 1s. 6d. each.

No. 2. 1½in. soldered joints ditto.

Put these down at 2s. 2d. each.

18ft. 6in. run 1¼in. lead flushing-pipes to closets.

Price at 1s. 2d. per foot, including fixing.

No. 2. 1¼in. soldered joints ditto.

Say, 2s. each.

No. 2. Screw-down stop-cock, soldered joints, and union at ends.

Cost would be about 20s. each.

Provide and fix complete Duckett's patent automatic slop-water closet where shown, with quatrefoil pan, fluted pedestal, seat 19½in. long, for 6in. outlet, with turning trap, &c.

To price this item consult Messrs. J. Duckett and Son's catalogue.

	£	s.	d.
Complete closet, cost, plain pan	1	8	0
Add for fluted pedestal, &c.	0	12	0
Stanford joint between tipper-box and trap	0	1	0
Labour, fitting, &c.	0	5	0
	2	6	0

This price does not include carriage from Burnley.

Provide and fix No. 6 Duckett's automatic multiple closets where shown, according to C^2 arrangement, 2ft. 6in., length of pan to floor, 9in. wall; upper pan plain, enamelled inside.

	£	s.	d.
The price given on list is on rails at Burnley	7	10	0
Enamelled inside, add	1	10	0
Labour, fixing, say	1	5	0
	10	5	0

Duckett's patent trough closets are economical and sanitary, the price for a set of 6 salt-glazed earthenware, with pine seats, is only £4 10s.; or if seats are painted and varnished, 5s. extra each.

LONDON COUNTY COUNCIL IMPROVEMENTS.

THE Improvements Bill of the London County Council contains proposals involving in all a gross outlay of three millions. The Thames Embankment extension scheme comprises an embankment wall and an embankment on the foreshore of the river Thames in continuation of the existing river embankment south of the Houses of Parliament, commencing at the present termination of the existing embankment at the south-eastern corner of the Victoria Tower-gardens and terminating at the northern side of Lambeth Bridge. These works are to be supplemented by a new street, consisting in parts of widenings in Abingdon-street and Millbank-street, commencing in Abingdon-street opposite, and terminating at the western end of Lambeth

Bridge; a widening of Horseferry-road on the northern side thereof from Lambeth Bridge to Carpenter-street; a widening of Wood-street on the southern side thereof from its junction in Millbank-street to its junction in St. John-street, and various alterations in Smith-square and the approaches thereto.

The estimates which have been proposed by the Council as to the amount which they will require to expend on capital account for the purposes of the Bill and such estimates are as follows:—The Thames Embankment extension and improvements at Westminster, £1,319,000; Mare-street (Hackney) widening, £660,750; Goswell-road widening, £227,800; St. John-street (Clerkenwell) widening, £92,400; Blackstock-road (Islington) widening, 5,200; Archway-road (Islington) widening, £6,000; Kentish Town-road widening, £10,450; Nine Elms-lane widening, £171,300; Camberwell New-road widening, £53,000; Harleyford-street (Lambeth) widening, £16,900; Streatham High-road widening, £194,200; widenings at Battersea Rise, Wandsworth Common, and West Hill, Wandsworth, £60,800; widenings at Blackheath-road, Blackheath Hill, Shooters Hill-road, and New-road, £41,200; widenings at Lewisham High-road, Loampit Hill, Loampit Vale, Lee High-road, and Eltham-road, £86,500; High-street and Gardener's-lane (Putney) widening, £45,030; Maclise-road (extension to Hammersmith-road), £4,560; total, £2,995,090.

It is proposed that the works to be authorised in connection with the Thames Embankment extension and Westminster improvements shall not be carried out unless a sum of £100,000 as a contribution towards the cost and expenses thereof is agreed to be paid by the council of the city or borough of Westminster constituted or to be constituted under the London Government Act. The powers to widen High-street and Gardener's-lane, Putney, and those regarding Maclise-road (Hammersmith extension) may and shall, if required by the local authority in either case, be transferred to the Wandsworth District Board and Hammersmith Vestry respectively. The Westminster and Putney improvements are subject to a betterment clause.

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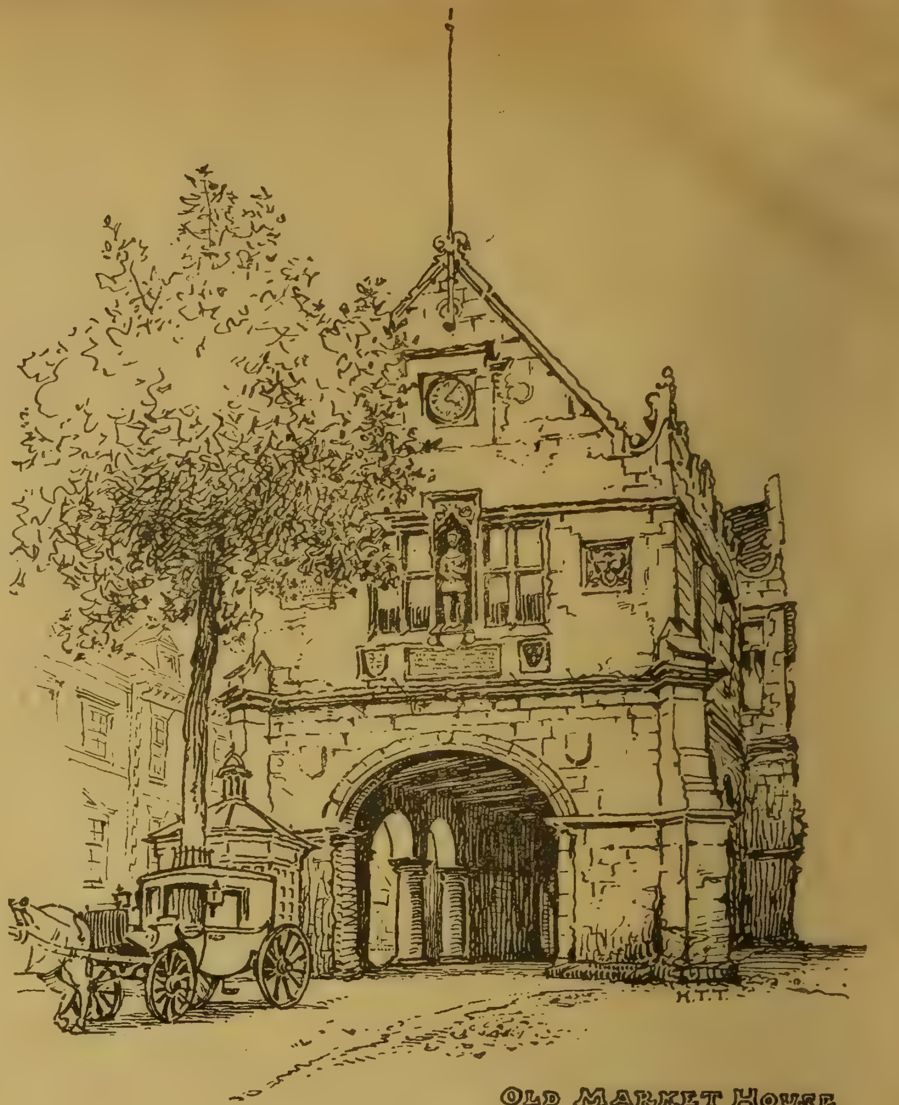
NOOKS AND CORNERS OF SHROPSHIRE.

To the architect and lover of old English domestic buildings, there is, of course, no richer or more delightful hunting-ground than Shropshire, so that there can be but little doubt as to the popularity which will be accorded to the volume of sketches and recording chapters, accompanied by detailed descriptive notes, which Mr. Elliot Stock has just published* from the pen and pencil of Mr. H. Thornhill Timmins, F.R.G.S., whose previous books of a like kind on Herefordshire and Pembrokeshire have already secured a favourable reception. The volume before us assumes the character of an itinerary of sketching rambles throughout the county, with gleanings of Salopian scenes and lore compiled in a familiar way concerning many places. Some, of course, are well known for their importance—such at Shrewsbury, Ludlow, Wenlock, and Stokesay. The major portion of the subjects, however, are chosen from more remote examples not so much associated with the beaten track of the ordinary tourist, and thus they present a freshness to the general reader, including not a few architects, of course, who will be glad to possess a note-book guide of this description.

The accompanying reproductions of the author's sketches are chosen to give an adequate idea of the drawings which enliven this volume. The first of these gives a foreshortened view of the Renaissance Market-house at Shrewsbury, the chief building of historic importance in "The Square," which is situated in the heart of the city. It is said that the clock in the gable occupies the place of the one Falstaff referred to when declaring that, against tremendous odds, he had "fought a long hour by Shrewsbury clock." Whatever doubts may be entertained as to the accuracy of this statement, there can be none as to the origin of the figure in the niche below, seeing that a panel alongside it records that "This statue was removed by order of the mayor from the tower of the Welsh bridge in the year 1791." The effigy is generally supposed to represent Edward IV., father of Richard, Duke of York. The opposite gable has a similar niche with a figure of an angel bearing a shield, charged with the arms of England and France. There is a canopy on the west front inclosing the arms of Elizabeth and the date of the building, 1596. Lloyd's Mansion, with its big bays of timber-work, is situated in the same square. From the Clun Forest district, on the way to Knighton and Ludlow, is Chingford, a mere village which has a restored church with some old "Leper" windows, long a bone of contention to local archæologists. Not far off from this place, and within easy distance of Hopton Heath station, is Heath House, a big brick 17th-century residence, seated in a broad park. Inside the house there are several handsomely panelled rooms, but the feature of the place is the old oak staircase, of which we give a drawing. It is very massive, of simple design, the work bearing the strongest evidence of the craftsman's tools, a quaint and rambling piece of construction, setting off well the tapestry hangings on the walls. In the neighbourhood of Stokesay Castle, with which every architect is more or less acquainted, is Church Stretton, a mere village, though it is called a town, half-way between Ludlow and Shrewsbury. Just off its rambling picturesque street, at the rear of the Buck's Head Inn, formerly the manor-house, stands the parish church dedicated to St. Laurence and cruciform on plan, well situated midst some fine elm-trees. The grey stone tower rises in an imposing manner, as will be seen by the accompanying view. Norman work is to be found in the chancel, and several features of archæological charm are to be seen in the interior. The fine 13th-century roof and there is some curiously carved oak panelling round the sanctuary. To the caps of the pillars are some groups of sculptured heads attracting attention. Nestling under the broad height of the Longmynd hills, Church Stretton is seen to great advantage, making a charming picture of rural scenery.



OLD MARKET HOUSE SHREWSBURY.

From Bridgnorth, Mr. Timmins gives several drawings, among them being the slight sketch herewith printed of the market-place, where stands the ancient town-hall with its plain semicircular archways spanning the road. The upper stage is in half-timbered work relieved by projecting bay windows filled with old glass. Surmounting the whole is a bell turret finished by a good iron vane. The town-hall was built in 1652, on the site of an earlier building, destroyed during the civil wars. The Council Chamber and Court of Justice occupies the present building, wherein some modern stained glass, erected in honour of the Queen's Jubilee, affords a study of the corporate life of the town. The Swan Inn faces the town-hall, and is a rare specimen of a county-town hostelry of Tudor times. The pented booths, with the crowds frequenting the market on Saturdays, make an animated scene of picturesque variety, backed up by the quaint old houses of this rambling thoroughfare. The Classic tower of St. Mary Magdalen's Church, designed by Telford the engineer, already shows signs of instability. It occupies the site of one of the oldest ecclesiastical foundations of the town. One other drawing remains to be mentioned, and this shows an old wrought-iron inn sign from Broseley, which otherwise has little to interest the artistic visitor. As a specimen of local smith's design, it is both typical and interesting. There are many such to be seen in the district, such as that of the sign of the Raven Tavern at Much Wenlock.

Throughout the county it is readily observable how the type of Renaissance noticed in the grammar-school and town-hall at Shrewsbury is maintained, and the student must be struck by the similarity of its detail in other parts of Shropshire. For instance, the same spirit is seen in Hill's Mansions, Shrewsbury, and Bragginton Hall, which lies in an outlaying nook of the county beyond Woolaston, and dating from 1674.

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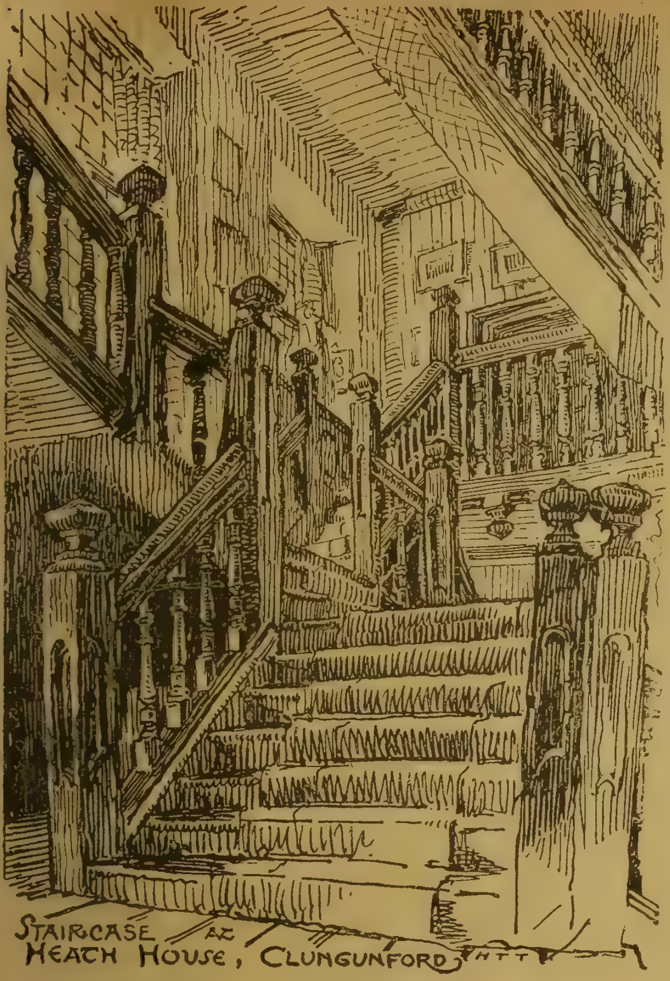
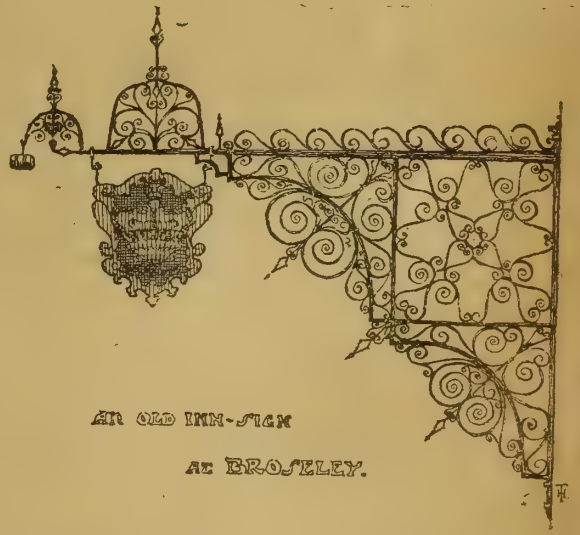
* Nooks and Corners of Shropshire. By H. Thornhill Timmins, F.R.G.S. London: Elliot Stock. 21s. net.



Staircase at Heath House, Clungunford

Church-Stretton

Market Day at Bridgnorth.



An Old Inn-Sign at Broseley.

The old well near Albrighton, locally known as the "Pepperbox," is hexagonal on plan, and much worn and weathered by time. It looks well worthy of the architect's measurements, and is to be found in a garden at Pepperhill, which is almost on the borders of Staffordshire. We do not remember to have seen a drawing of it before. Madeley Court, with a tower-flanked gate-house, was once used by the Priors of Wenlock, and appears to be worthy of being better known, though the interior presents little attractions. It is near Buildwas Abbey, which everybody makes a point of seeing when at Much Wenlock. Shipton Hall, too, with its forecourt garden, is fairly familiar, like Plash Hall and Pitchford, all of which are shown, though we hardly think that the last two named are done justice to by Mr. Timmins from an architectural point of view. However, enough has been said to amply justify the favourable commendation with which our notice opened, and it is but fair to observe that the author has well fulfilled the project with which he set out, not aiming at a scholarly treatise so much as a familiar guide in a popularly artistic sense. His drawings are spiritedly done for this purpose; the book is well printed and nicely got up, certainly deserving of a place in the library of those whose holidays throughout the county are planned with a due regard to seeing, and not missing, old buildings and places well worthy of being visited. Moreover, the volume serves as a record of such places very useful for reference.

FIRE-TESTS WITH FLOORS, ETC.

THE British Fire Prevention Committee's fire-tests follow in quick succession. We have amongst the more valuable tests recently undertaken and reported, one of a floor of steel joists, with coke-breeze concrete filling. This floor met the requirements of the London Building Act very completely as regards the nature of the fire-resisting aggregate, but collapsed in a fire of under one and a half hour's duration. The report is very important just now, as it shows how many so-called "fire-proof" buildings, which conform to the requirements of the L.C.C.'s by-laws, are not beyond suspicion as to their fire-resisting qualities. The area of floor tested was 100ft. superficial, or 10ft. square, and the floor was loaded with 168lb. per foot distributed. The report says:—"After twenty minutes, and at a temperature of 1,200° Fahr., the steel joists began to deflect, and continued to do so until a maximum deflection of 10½in. was recorded. After about one hour and twenty-five minutes, and at a temperature of about 1,650° Fahr., the bulk of the concrete in the two outer bays collapsed bodily. The concrete in the two remaining bays, and the concrete that fell was slightly disintegrated on the underside. The concrete that fell was not broken." Thus the test, as originally proposed, could not be completed, and the temperature obtained was much lower than the 2,300° Fahr. proposed in the object of test, which was to record the effect of a fire of 2½ hours' duration, commencing with a temperature of 500°, and followed at the end of the test by the application of a stream of water for three minutes, and the consequent rapid cooling. The floor consisted of three steel joists, 5in. by 4½in., weighing 19lb. per foot fixed on 4¼in. offset of walls, and 2ft. 6in. from centre to centre. The concrete was filled in on top of centring and between the joists to their full depth, and was composed of coke breeze and Portland cement in the proportion of 5 parts of coke breeze and 1 part of cement; the coke breeze was quite dry. The concrete was turned over four times dry and four times wet, and was mixed in batches of 1½ yards at a time. The quantity of water used for each batch was 30 gallons. It was carried to the floor in buckets, and filled on the centring in two layers 2¼in. each, and trodden in and beaten with flat side of shovel. The underside of joists was exposed. The centring was removed after 18 days. The full description of this fire-test is given in the report No. 34, where photographic views of the floor after the test showing the broken-away concrete and the deflected joists are given. After the test, cracks were found in the unfallen concrete, and the one joist had a permanent set of 12in. The test was carried out by a sub-committee comprising Mr. Ellis Marsland, district surveyor of Camberwell, directing member, Mr. Chas. E. Good, M.Am.Soc.C.E., and Mr. Frederic Hammond, F.R.I.B.A., district surveyor, East Hampstead.

Another report is on the fire-test of a ceiling constructed with silicate cotton (slag-wool) by Messrs. D. Anderson and Son, Ltd., and Messrs. J. C. Broadbent and Co., Ltd., London. The object of the test was to record the effect of a fire of one hour's duration, gradually increasing to a temperature of 1,800° Fahr., followed by an application of water for two minutes. The floor was erected in July last, and consisted of deal joists, 9in. by 3in., 19in. to centres, and resting on walls. Two joists were spiked together in centre of floor. At both sides, at the end of each joist, and screwed thereto, was a slag-wool slab, 1in. thick, 5in. wide, and of full depth of joist. On top of joists was ⅞in. beaded boarding, tongued and grooved, nailed with floor-brads. Slag-wool slabs, 1¾in. thick, were fixed to underside of joists, and projecting down the walls all round about 3in., secured to joists with 3¼in. screws and washers. The screws were inserted in asbestos tubes 1½in. long. The slag-wool slabs comprised the wool inclosed on both sides with galvanised wire netting, No. 19 gauge and 1in. mesh, and butted against each other. Underneath the ceiling was formed of ⅞in. tongued, grooved, and beaded boarding nailed through the slabs to joists. There was a wood moulding round the walls covering the slag-wool which projected below ceiling. Each end of joist was grouted in with fireclay, and space between ends filled in with brickwork. The report says, at the conclusion of the test, the flooring over the ceiling was uninjured; at no time did the temperature of the flooring exceed 90° Fahr. during the test. After the test the joists and flooring were sound, and not damaged by fire except for a small hole burnt in the flooring some three hours after the end of test. Full details and particulars are given, which show that, when slag-wool is carefully applied, and the ends of wooden joists are protected by slabs and the slag-wool brought down all round the walls, it affords a wonderful protection to the combustible materials; that ceiling slabs, encased in galvanised wire-work, provide a splendid fire-resisting material. We refer our readers to the reports themselves, edited by Mr. Edwin O. Sachs, for further information.

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THE CANTILEVER BRIDGE: ITS DESIGN AND CONSTRUCTION.—XVIII.

It must be acknowledged that the cantilever bridge constitutes one of the most instructive examples for investigation and analysis that any similar type of construction could offer to the student and our younger readers. With the exception of the arch and the suspension bridge, which in reality have but one common principle between them, the cantilever bridge combines in itself the essential characteristics of three other types of bridge designs. These three comprise the independent truss or girder supported at each extremity—the cantilever fixed at one end and unsupported at the other, and the anchor arm which, according to certain conditions of loading, acts sometimes upon the one and sometimes upon the other principle, and, as will be subsequently shown, must be designed to be equal to the double duty required of it. In other words, the anchor span behaves exactly in the same manner in which the movable arm of a swing-bridge does—first, when it is open, and, secondly, when it is closed. It is necessary to make a few remarks respecting the previous statement that the same principle applies, *cæteris paribus*, to both the arch and the suspension bridge. If we take the supporting chain of any ordinary suspension bridge, and suppose it capable of withstanding a thrust or stress of compression, and turn it upside down, it becomes a linear arch or equilibrated rib. So long as the position, direction, and amounts of the loads are unaltered, save in so far that they act downwards towards the centre of the curve instead of away from it, a compressive stress will be indicated at each point in the linear arch, precisely equal to the tensile stress developed upon the original supension chain. It is well known that the linear arch does not exist; but, nevertheless, all the formulæ, equations, and assumptions respecting suspension-chains apply with equal force to arches of masonry and metallic arched ribs, where the thrust takes the place of a pull.

Table I.

H A	A B	B C	C D	D E	E F	F K	A P	C P	E P	B P	D P	F P
0 00	− 1·65	+ 0·65	− 0·90	+ 0·50	− 0·60	+ 1·00	0·00	− 1·20	− 1·80	+ 1·15	+ 1·75	+ 2·05

It must be borne in mind that in checking calculations a certain fair amount of difference always exists, and must be allowed for in all results and calculations obtained by two independent methods of investigation, yet the discrepancy must not be too wide. When it does occur, as it sometimes will, in spite of the greatest care and attention, there is only one safe and proper course to pursue, however tedious and troublesome it may appear. It is that of going over the whole work again, or, better still, of obtaining the services of another person to go over it, for though it may seem a little paradoxical, it is by no means an uncommon thing, for even experienced mathematicians and arithmeticians, to make the same error a second time in their calculations. There is another reason also for following the advice we have given, and that is that it does not necessarily follow that only one method may not have been investigated correctly. The results of both may prove erroneous. If a third separate method is available as a check, it should always be employed, but it is not always that this advantage is one that can be availed of. We have been rather particular in our remarks upon this detail, and advisedly so, as we have known some very serious consequences result from neglect of this precaution.

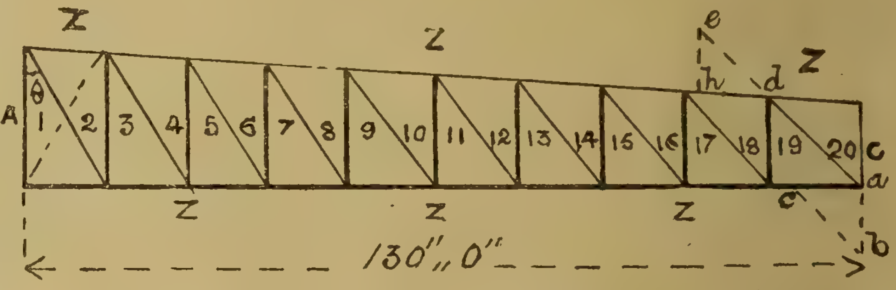


Fig. 1.

A skeleton elevation of the cantilever-arm is given in Fig. 1, and it will be found convenient to draw attention first to the stresses upon the different members of it, due to the action of the weight supported at the free end. Since the total load, dead or live, of the independent central girder was found to be equal to 90 tons, and as each cantilever-arm carries one half of it, there is a load of 45 tons at the free end *a*, in Fig. 1, which will be transmitted to the fixed end A 1, and, by constituting the normal reaction at that point, will furnish an excellent check upon the accuracy of the calculations.

Before proceeding to investigate and analyse in detail the stresses upon the different members of the cantilever-arm, it will be advisable, as we have frequently impressed upon our readers, to examine the form of the truss itself, and obtain a good general idea of the manner in which the stresses act, and how they are ultimately disposed of. It should be mentioned that the original diagrams and figures from which our cuts and illustrations are derived are drawn to a much larger scale than our present space could accommodate. In one sense, in drawing diagrams—whether frame, stress, force, polar, or funicular diagrams—it might be said that, the larger the scale upon which they are delineated, the better. This is true in the main; but there is not only no advantage to be gained by adopting an abnormally large scale, but a positive disadvantage is incurred. While the scale for the weights, and consequently for the induced stresses, adopted for any figure or diagram should always be conveniently large, there is nothing to be gained by making them read too fine, any more than there is in employing in calculations too many decimals. The disadvantage, on the other hand, of plotting not merely the diagram itself, but the weights and stresses as well, to an unnecessarily large scale, is that a great deal more trouble, as well as chance of error, is incurred by the extra length of the various lines and the extra distance apart they must be drawn, not to mention the difficulty of accurately transferring lines which are parallel to others over a large area of paper. In most treatises and textbooks on professional and scientific subjects there is a tendency to carry all subdivisions and decimal figures to a pitch of minuteness, which is, in the first place, practically worthless, and, in the second, almost ludicrous. The real guide to these subdivisions is the unit or dimension employed. If we are dealing with miles it is obvious that the fifth decimal place will represent an appreciably small quantity; but if inches are treated of, three, or at the most four, places will be quite sufficient. Some people appear to think that because tables of logarithms are calculated to seven places of decimals it is absolutely imperative to use them all on every occasion. There is just one more point to be taken into consideration, and that is the permissible limit of error, for it is not often that calculations can be finished with a terminable decimal, among which repeating or recurring decimals must not be included. Examples of the former class will be found in the fractions ½, ¼, ⅛, and further subdivisions, and of the latter in ⅓, ⅙, ⅑, and in numerous others.

To return to the truss in Fig. 1, which has a weight of 45 tons, supported at the free end a_1 of the cantilever. Let this load for the present be made equal to the vertical line *a b*., It is clear that this load is carried by the two members of the truss *a d* and *c d*, and consequently induces stresses upon them. It must be premised that the bars 20 C and 20 Z do not undergo any stresses, although they are inserted to assist in connecting the independent central truss with the cantilever arm. The compressive stress *a c*, due to the vertical load *a b*, is constant throughout, both in amount and character, the whole of the lower horizontal chord of the truss, and is, as it were, transferred from the member 19 Z, forming the panel length at the free end to the member 1 Z, occupying a similar position at the fixed end. Thus the stress upon 19 Z, into which the load *a b* is resolved, is in the direction of the diagonal member of the web 19-20, and is equal to the line *c b*, which represents the tensile stress upon that bar. At the upper apex *d*, this stress is resolved into its two components, *e h* and *h d*, which give the stresses upon the vertical bar 18-19 of the web, and upon the inclined panel length 18 Z of the upper chord. A repetition of this process will, as in the case of the suspended central girder, give the stresses upon every member of the truss, due to the load at the free end; but they will not be multiples of the stress upon the terminal bar 19-20, as in the other truss with horizontal chords, uniform depth, and a constant value for θ, which is the angle between the diagonal and vertical bars in the web. Since the angle θ varies from 45° at the free end to 30° at the fixed end, the absence of any law or series governing the difference between the relative stresses upon the members of the web is readily accounted for. When once the value of θ is known, the stresses upon the diagonal members of the web, and upon the horizontal panel lengths of the lower chord are found as follows, taking, as an example, the panel length at the free end. Let W equal the vertical load $a\,b$, then if S be the tensile stress upon the diagonal member 19-20, and S_1 the compressive stress upon the member 19 Z, it will be found by scaling, bearing in mind that $W = 1$ ton, $S = c\,b_1$, $S_1 = a\,c$, and $\theta = 45°$, that

$$S = 1{\cdot}48 \text{ tons, and } S_1 = 1 \text{ ton.}$$

But since the triangle $b\,a\,c$, similarly to the half-panel 19, is right-angled, we have

$$S = \frac{W}{\text{Cos. }\theta} = W \times \text{sec. }\theta = 1{\cdot}414 \text{ tons} \;\ldots\ldots\; (1)$$

which is practically the same as the former value for S. By the same rule we obtain

$$S_1 = W \times \text{tan. }\theta = 1 \text{ ton} \;\ldots\ldots\ldots\ldots\; (2)$$

This method of calculation might be pursued throughout the whole truss, but it would not only be tedious, but, owing to the difficulty of measuring accurately, the numerous different values of θ, it might not afford results sufficiently exact, and, therefore, other methods are generally employed, which will be now described. But, previously to so doing, it should be mentioned how the stresses upon the members of the inclined upper flange or chord obtained by the principle of the resolution of forces can be checked by analytical calculation. For instance, the tensile stress upon the inclined member of the upper chord 18 Z is equal by scale to 1 ton, equal in the force diagram of the triangle $d\,e\,h$ to the line $h\,d$. In the same triangle, the only known force is that represented by $d\,e = S = c\,b = 1{\cdot}414$ tons. The angle at $e = \theta$, and making angle at $h = \phi$, and S_2 equal to the stress required upon the member 18 Z, we have the following proportion:—

$$S_2 : S :: \text{sine }\theta : \text{sine }\phi \;\ldots\ldots\ldots\ldots\; (3)$$

From which solving for S_2 its value is—

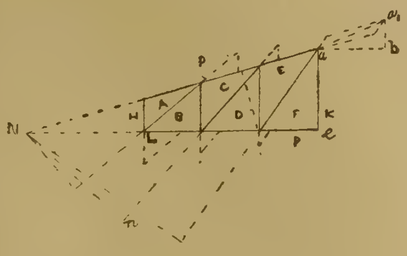
$$S_2 = \frac{S \times \text{sine }\theta}{\text{sine }\phi} \;\ldots\ldots\ldots\ldots\; (4)$$

Substituting the values for θ and ϕ, the equation becomes—

$$S_2 = \frac{1{\cdot}414 \times 0{\cdot}997}{1{\cdot}414} = 1 \text{ ton as before} \;\ldots\ldots\ldots\; (5)$$

To render plain and intelligible the other method of determining and checking the stresses upon a cantilever truss, the small example shown in Fig. 2 has been selected; but it contains, nevertheless, a sufficient number of separate parts to establish a principle for the calculation of the stresses of a similar truss with any number of panels, including the accompanying vertical and diagonal members. In the first place, the stresses are obtained by the resolution method already used, and subsequently checked by another and an independent process. It should be mentioned here that the difficulty of dealing with a heavy load and plotting it to even a moderate scale is readily surmounted. Let it be assumed that in Fig. 2 the vertical load at the free end of the cantilever was equal to 45 tons, as actually occurs in the truss in Fig. 1. It is only necessary to suppose the vertical dotted line at the free end of the truss in Fig. 2 to represent any sub-multiple of the real load, such as in the present instance, 5 tons; then the stresses brought upon the members by this load would simply have to be multiplied by 9 to give those actually brought upon them by the load of 45 tons. In the small example in Fig. 2, the load, and consequently the vertical dotted line representing it, is made equal to 1 ton. It is not necessary to recapitulate and trace the respective stresses throughout the whole truss, as the different dotted lines fully explain their action, and when measured by the same scale adopted for the vertical load, will give their respective amounts. We may, therefore, proceed to tabulate the stresses as shown in Table 1, and to check them subsequently to prove their accuracy. It must be borne in mind that the stresses upon the inclined upper and horizontal lower chords are cumulative. Considering, in the first place, the upper chord, the stress upon the member C P will be transferred to the fixed end F E, and in transit will stress the intermediate member, E P, to the same extent. But the inclined member, E P, will also have an additional stress brought upon it, due to the pull of the diagonal bar, C D, of the web, which is resolved into the stress upon the upper chord, E D, and upon the vertical member, D E, as shown by the dotted lines in the figure. An exactly parallel condition exists in respect to the lower horizontal flange, in which the compressive stress upon the terminal panel length, B P, is transmitted, unchanged either in amount or character to the chord member, D P, and thence to the last panel length, F P, at the fixed end. Summing up, therefore, if S_1 be the stress upon B P; S_2 that on D P, and S_3 that upon F P, we shall have, putting T_1 T_2 + T_3 for the corresponding total stresses upon the same respective members, the following three equations—

FIG. 2.



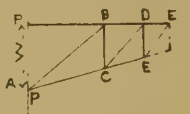


FIG. 3.

$$T_3 = S_1 + S_2 + S_3. \quad T_2 = S_1 + S_2 \; T_1 = S_1.$$

It will be seen in Table 1 that the total stresses are only recorded, as, after what has been stated, it is not necessary to mention each separately, and then sum them all up. Some little explanation may be required respecting the stress diagram to the right of the upper apex at the fixed end of the truss in Fig. 2, which enables the stress upon the end or last vertical, F K, to be ascertained. This vertical, as an inspection of the diagram will indicate, is subject to two stresses upon it, one owing to the action of the stress upon the member E P of the upper chord, and the other to that of the stresses on the diagonal E F.

Each of these stresses can be resolved into a couple of components, one acting downwards upon the vertical F K, and the other in a horizontal direction, which, as will be subsequently seen, is counteracted by the resistance of the anchor arm. Both these stresses may be separately resolved in these directions, and the sum of the vertical components will give the total compressive stress upon F K. It will, however, be simpler to adopt the method shown in the figure. Upon the prolongation of the bars E F and E P, plot off to the same scale as used for the other members of the truss the stresses given in Table I. as indicated by the dotted lines; then complete the parallelogram of forces, draw the resultant $a\,a_1$, and from the point a draw the perpendicular $a_1\,b$ to meet the horizontal line $a\,b$, and the line $a_1\,b$ will represent the stress upon F K, which will be equal to the reaction at the fixed end, which is equal to the load carried at the free end of the cantilever.

We may now proceed to check the stresses upon some of the members of the truss in Fig. 2 by the independent method of moments, and let the diagonal bar C D be selected to begin with. The moments may be taken about the point N, at the intersection of the upper and lower chords of the truss. The lever arm of C D about the point N is N n, and that of the weight N L; and putting S for the required stress on C D and W for the weight at the free end, we have—

$$S \times N\,n = W \times N\,L.$$

Measuring the lever arms upon a convenient scale, we find that in the case before us the value of the lever-arms are N = 27 and N L = 24, and substituting these equivalents for the symbols the equation becomes—

$$S = \frac{W \times N\,L}{N\,n} = 0{\cdot}89,$$

which agrees with the stress already tabulated. The dotted lines in Fig. 2 represent the prolongation of all the diagonal members of the web, and their lever-arms about the intersecting point of the two chords, from which data the stresses upon them can be determined. Any scale can be used for measuring the lever arms, provided the same scale is used for all. For the vertical D E, taking moments about the same point N, and putting S to represent the stress, its amount is—

$$S_1 = \frac{W \times 24}{48} = 0{\cdot}5.$$

For the stress upon the members of the lower chord take that upon F B. The amount of this about a is, putting S_2 for the stress, S 2 × $a\,c$, and the moment of the load at the free ends is W × L c, from which—

$$S_2 = \frac{W \times 16{\cdot}5}{34{\cdot}5} = 2{\cdot}1.$$

Similarly for the upper chord EP, we obtain—

$$S_3 = \frac{W \times 23}{13} = 1{\cdot}77.$$

The general method of obtaining the stresses upon trusses, in which there are no redundant members and no reversals, is by a reciprocal stress diagram. The stress diagram corresponding to the truss in Fig. 2 is given in Fig. 3. For the sake of clearness it is drawn to double the scale of the truss, and consequently all the stresses upon the different bars will measure twice those in Fig 2, but will be numerically the same as in Table I. The principle of the reciprocal stress diagram will be applied to determining the actual stresses upon the cantilver-arm in Fig. 1 in out next article. T. C.

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THE GLASGOW BUILDING REGULATIONS.

THE new building regulations that have been framed to amend and extend the provisions of the Glasgow Police Acts, 1866 to 1899, relating to the streets, sewers, and buildings of Glasgow, form the subject of a Bill of some importance. The proposed Act is to be cited as the Glasgow Building Regulations Act, 1900, and is divided into 16 parts, as follows:—I. Preliminary, II. Streets; III. Through Ventilation, Free Space, &c.; IV. Sewers, Drains, Cesspools; V. Water-closets, Soil Pipes, &c.; VI. Building Line, Sites, and Foundations; VII. Height and Cubical Extent of Buildings; VIII. Construction of Buildings; IX. Noxious and Dangerous Businesses; X. Theatres and Public Buildings; XI. Special Provision for Certain Buildings; XII. Neglected Structures; XIII. Scaffolding, Barricades, &c.; XIV. Procedure, Expenses, Notices, &c.; XV. By-laws and Penalties; XVI. Savings—i.e., Exemptions, &c. We can only refer briefly to a few of the chief provisions of this Act. The definitions are concise, and, on the whole, satisfactory. A "building" includes any wall or structure, and any alteration in or addition to a building. A "new building" includes "any building after the passing of this Act; any building which has been taken down for more than one half of its cubical extent, and re-erected, or commenced to be re-erected, wholly or partially, on the same site after the passing of this Act." A "public building" is defined as "a building used or constructed, adapted, or altered to be used as a church, chapel, or other place of public worship, or as a school, college, or place of instruction (not being merely a dwelling-house so used), or as a public theatre, public music hall, public hall, public concert-room, public ball-room, public lecture-room, or public exhibition-room, or as a public place of assembly or a building used or constructed, or adapted to be used, for any other public purpose, and includes a building used or adapted to be used as an hotel, lodging-house, refuge, or shelter where such building extends to more than 250,000c.ft., or has sleeping accommodation for more than 100 persons." This definition is pretty comprehensive, and is practically the same as that of the London Building Act, but excluding a hospital and workhouse. A "building of the workhouse class" is also described as that in the latter Act, except that a domestic building is not excluded, any building in fact so described "exceeding 150,000c.ft. which is not a public building." Party-wall is thus defined: "An external gable or main wall not less than 9in. thick carried up to the height of the external walls, and dividing a building into separate occupancies." A definition simpler than that of the London Building Act, and to some extent more expressive of a party-wall.

An important part of the Bill to be promoted deals with streets, and section 26 provides that every street of a width of not less than 80ft. may be made if the corporation think fit to enclose a free space of at least 25ft. wide in the centre as an ornamental pleasure-ground or shrubbery—a provision that might be usefully followed in other towns. The through ventilation of "hollow squares" formed by the streets is another valuable measure in Part III., section 35, and which provides that where the design of one or more streets, taken by themselves or in conjunction with other streets, contemplates the erection of buildings so placed as to form part of a hollow square, the Dean of Guild, before sanctioning such streets, shall require the owner to provide, for the purpose of through ventilation, an opening not less than 15ft. wide from street to street through such hollow square; the opening to remain open from the height of 15ft. upwards. This section not to apply to buildings to be used other than dwelling-houses. Where any streets have been laid out as to contemplate such a hollow square, the Dean of Guild shall not (except where provision is made to his satisfaction for thorough ventilation) grant the erection of any dwelling-houses fronting any such street unless an opening of this width has been provided, and, failing agreement among the owners as to expense, the Dean is to have power to fix the sum to be paid by owners, &c. These provisions are not to apply in certain cases where the buildings which form part of the hollow square do not exceed four stories in height, and the inclosed space of background in such square contains, free of erection other than the usual one-story offices, upwards of 1,800 square yards, and is not less than 90ft. across at narrowest part; nor in cases where the buildings do not exceed three stories, with an inclosed space of 1,400 square yards (section 38); and no buildings other than the usual one-story warehouses and offices are to be erected within the inclosed space in any hollow square, except in those cases where the space exceeds the dimensions specified, where arrangements for ingress and egress, drainage, &c., are done to the Dean of Guild's satisfaction, in which case two-storied buildings may be allowed, if not offensive or injurious, provided an entry of 10ft. wide be provided from a street. Section 40 makes it unlawful for any apartment to be used as a dwelling-house "unless one-half at least of its height from floor to ceiling is above level of street and back court," and unless there is an open area along its whole length, and unless such space is as broad as the part of the height of dwelling below level of such street and back court, and is 1ft. below floor of such apartment. An open space is also to be provided in front of any sleeping-room window in any apartment of at least three-fourths of the height of wall in which such window is placed, and in front of at least one half of such window (Sect. 41). One safeguard is introduced—namely, "The same open space measured in a line extending outwards and upwards from the window to the distance specified shall not be available for any other sleeping apartment whose window is not in the same plane," a rule that will prevent any projecting window participating. Next coming to Part VI., which deals with building lines, sites, and foundations, section 61 provides (1) that no building without consent in writing of the corporation is to be erected beyond the general line of buildings in any street, place, or row, where the distance of the line of buildings from the nearest part of the street does not exceed 30ft. or within 30ft. of the street where the distance of the line of buildings therefrom exceeds 30ft.; (2) this section does not apply to buildings erected after the commencement of Act, upon land which at any time within seven years previously is, has, or shall have been occupied by a building.

As to the height and cubical extent of buildings section 67 provides that no building other than a church shall, except with consent of the corporation, be erected in, on, or adjoining any street of a greater height than the width of such street, and in no case, except with consent, shall such height exceed 90ft. The London Building Act limits the height to 80ft., exclusive of two stories in the roof, except with the consent of the Council; so that the Glasgow regulations will be practically the same. Of course, such height of 90ft. is exclusive of towers, turrets, or architectural features. The provision of this section does not apply to the rebuilding of any previously existing building. The height of dwelling-houses is, by section 68, not to exceed the width of the street, and this applies to alterations of dwelling-houses. Where a building fronts two streets, the wider street is to regulate the height, the height in these cases to be taken from the level of street to the ridge of roof—a rule that will prevent any steep roof. This is undesirable. Section 71 provides that in every building exceeding 200 square yards in area, used in part for trade or manufacture, and in part as a dwelling-house, the part used for trade, &c., is to be separated from the dwelling-house portion by walls and floors constructed of fire-resisting materials, and all staircases, passages, and other means of approach to the latter portion shall be constructed throughout of fire resisting materials. The part used for trade or manufacture, if extending to more than 250,000c.ft., to be subject to the provisions of the Act relating to buildings of the warehouse class. Section 72 fixes the cubical extent of buildings of the warehouse class, unless with consent, to 350,000c.ft., beyond which party-walls are to be used in such manner that no division of such building shall extend to more than 350,000c.ft. This rule does not apply to one-story buildings of brick, stone, iron, or other incombustible material. Consent to large dimensions may be given by the Dean of Guild if he is satisfied additional cubical extent is necessary, and is also satisfied that proper arrangements have been made for lessening danger from fire provided such building (1) shall not extend to more than 500,000c.ft. without being divided by party-walls in such manner that each division does not exceed 450,000ft., and (2) shall not be used for any trade involving the use of explosive or inflammable materials.

The construction of buildings in Part VIII. deals with the strength of floors, walls, roofs, &c., of all classes of buildings, and is of considerable importance. We can only glance at a few of the sections here. Section 75 applies to all new buildings of the several classes, and all buildings erected before or after the passing of the Act which may be altered or adopted for such uses aforesaid. These are to be of sufficient strength, and shall be designed and constructed so that the completed structure shall, in addition to the weight of the materials, be able to carry as a safe load the following minimum weights:—

Dwelling-houses, 100lb. per square foot of floor; halls, schools, churches, theatres, music-halls, &c., 180lb. per square foot of floor; warehouses, stores, factories, and workshops, 224lb. per square foot of floor.

A safe load upon timber shall be held to be one-seventh, upon wrought iron one-fourth, and upon cast iron one-sixth of the breaking strain. Subsection 2 is important; it determines the weight to be placed on an upper floor of any existing or new building. It must have been constructed for the purpose, and be supported upon beams or columns of stone, brick, iron, or other incombustible material. Such weight includes machinery, goods, or merchandise. Any weight which exceeds 224lb. per square foot of floor space is forbidden. Walls, piers, and columns for support are to rest upon a sufficient foundation, beam, arch, lintel, &c., resting upon sufficient walls or piers, and are to be of brick, stone, iron, or other incombustible material. Metal beams and arches, lintels, and columns to be protected against fire to the Dean of Guild's satisfaction. Other clauses refer to thickness of walls prescribed by schedule; to incombustible materials for walls, gable walls to be carried up 12in., 9in. thick, above roof; to damp-courses, street floor level of dwelling-houses, which is not to be less than 12in. above level of ground, recesses, and openings; to roofs, which are required to be constructed of, or covered with, incombustible material, except door-frames, window-frames, dormers, lanterns, turrets, &c. Section 87 provides that every roof is to be constructed to carry as a safe load a minimum weight of 50lb. per square foot of surface in addition to the weight of roof itself. Other regulations are made, but to these we cannot now refer. The sections dealing with chimneys and flues, theatres and public buildings, cubical contents, &c., for dwelling-houses, and with neglected structures are important, and to these we may return.

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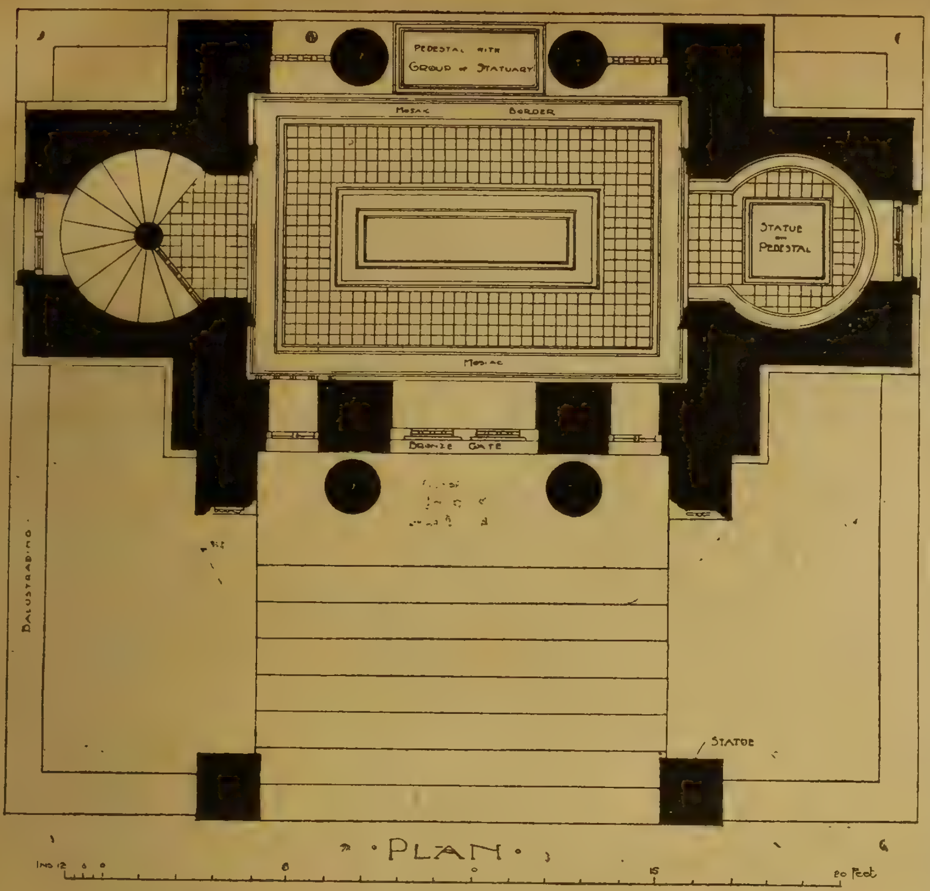
ELECTRICITY AND ITS DANGERS AS APPLIED TO COMMERCIAL INDUSTRIES.

IN a recent article we drew attention to the destructive effect produced in the corrosion, and ultimate reduction to a condition of perfect worthlessness, of metallic pipes used for the purpose of water supplies to large town and cities by the action of powerful electrical currents. It must strike the most superficial observer that the artisans, the working men, and others engaged in maintaining the water service, and administering to its never-ending requirements, must be exposed to a considerable amount of danger in discharging their duties from the same source. It needs but a very little more consideration to bring prominently and seriously to our minds that this exposure to grave accidents becomes greatly accentuated when electricity is employed, and its application to manufactories and workshops as a motive force is daily augmenting, upon a large scale in the midst of numbers of our labouring population. As the subject is one which concerns not only our own readers, but the welfare of the whole community at large, we offer no apology for introducing it to notice. We have no intention of entering into theoretical details or investigating, save in a general manner, the causes which conduce to the disastrous results that are a matter of history, and which, it may he regretfully but truthfully said, have at times culminated in loss of life. Our object is to point out the influence exerted by this still mysterious power, and to indicate as clearly and accurately, so far as actual experience is available, when it is to be feared, and, on the other hand, when it is comparatively harmless. We shall thus convey a warning that may be of use to our readers and the public generally.

It must be premised that the accidents of the nature under discussion due to the action of electricity are altogether of a physiological character. They are primarily caused by the contact of an electrical conductor with the body of a human being or animal, either at one or more points, while some other point of the individual or animal attacked makes contact with the earth. From the data at our command, industrial electricity, employing the term in the same sense as already defined, is not dangerous to human life until the current attains an intensity of over 500 volts, and the danger increases as the intensity of the current advances to 2,000 volts. After this limit is reached, the effects upon the human frame sensibly diminish, although it has not been yet ascertained what rule or law the change appears to obey. All accidents due to electrical contact are accompanied by both general and local effects, and among the latter are the inevitable burns which are always produced at the point where contact occurs between the flesh and the electric fluid. There is fortunately a wide difference between the nature of these burns and those caused under ordinary conditions. Electrical burns are not very painful, are very closely circumscribed, do not run into sores or suppuration, and heal on the first intention well and healthily. Electrical syncopy, which is an absolute loss of consciousness, belongs to the former class of accidents, and is evidently the result of the shock to the system, as it differs but slightly from that of the ordinary type. In the majority of instances it is only of a temporary character, and readily yields to proper treatment, and in no case does death ensue unless the current causing it continues in contact with the body.

There are three principal applications of the electrical current which the public have to guard against. The first is that of industrial electricity already treated of, the second that of the electric light, and the third that of electric conductors, conveying the motive-force to electric railways and tramways. Of these three, that of the electric light for houses and buildings does not, as a rule, surpass 120 volts, and is not capable of occasioning any serious accidents. But again, the intensity of the currents supplied to railways and tramways frequently reaches to as much as



NATIONAL SILVER MEDAL DESIGN FOR MAUSOLEUM.

800 and 1,000 volts, and electrical shocks produced by contact with them might be attended with very serious consequences. Great precautions are absolutely necessary in the interest of the public safety with respect to these conductors, especially those of the wire or overhead type, to prevent them coming in contact with either human beings or animals, which latter are particularly sensible to the effects of the electrical fluid. It is not too much to assert that overhead electrical wires working under a high voltage, unless protected in such a manner as to obviate all risk of accidents, which is in itself an obvious impossibility, constitute a real and constant danger to the security of the public.

It is with feelings of deep regret that we refer to a most unfortunate accident which occurred a few days ago, but we think it right to call the attention of our readers to the circumstances of the case, since it corroborates in a startling and deplorable manner the truth of the statements and remarks put forward in the present article.

"A sad fatality occurred at Bolton yesterday in connection with the Corporation extensive electric-lighting undertaking. Three men were engaged in removing the transformer at the underground sub-station, when one of the workmen, it is stated, made a mistake by switching the wires wrongly, thereby charging the transformer with 2,000 volts of electricity from the principal generating station. The result was that all three men suffered from an acute attack of syncope and were rendered insensible. Flames and smoke shot up in the air, creating great consternation amongst the townspeople. A corporation inspector, named Albert Sides, gallantly descended and rescued the men, but one of the workmen died later from asphyxia, whilst a second workman has since succumbed."

T. C.

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NATIONAL SILVER MEDAL DESIGN FOR A MAUSOLEUM.

[WITH PHOTO-LITHOGRAPHIC ILLUSTRATION.]

THIS design was prepared in connection with the monthly design competitions at the Glasgow School of Art. The conditions were :—"A small mausoleum for a private cemetery, site 24ft. by 24ft., including all steps, &c. ; style, Greek. In this case, instead of accepting the pure Greek features, an attempt was made to give more of the Egypto-Greek feeling, a style which lends itself very easily to monumental subjects of this class. The plan shows its general arrangements.

A. W. Gardner.

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WORKING-CLASS DWELLINGS IN ITALY.

THE housing of the working classes is a problem difficult to solve. Lord Rosebery, not many days ago, suggested that London labourers should be transplanted to a new suburb and new homes, sending them to and from their work by workmen's trains. The Birmingham City Council, at their last weeks' meeting, were advised to spend a sum of £100,000 to build working-class houses ; but no practicable scheme was laid before them by the gentleman who iniated the discussion. A greater measure of success seems to have attended an experiment tried by the municipality of Spezia at the instance of the Italian Admiralty, of which an account is sent by a special correspondent of the *Manchester Guardian*. The overcrowding caused by the influx of workmen by the carrying out of Government works led the Italian Admiralty to enter into a contract with the municipality of Spezia, the object of which was the proper housing of the dock labourers and their families. Sixty-two blocks were erected, divided into 992 dwellings ; for a flat containing three rooms and a kitchen the rent per month being fifteen lire, equal to about 11s. 6d. English money, while for an additional two lire the tenant can have a small plot of garden.

There is said to be no lack of tenants for the premises, the cheapness as well as the comfort of these municipal buildings always attracting more applicants than can be accommodated. The drawback so far as the public are concerned is that none except Government employés are eligible as tenants. A deduction from their weekly wages is made for rent, and the State authorities hand over to the municipality the rent of the houses once a quarter. In order to encourage steadiness on the part of the workmen, a specially well-thought-out arrangement operates by which a tenant can become proprietor of his own flat at about "cost price," by payments covering a long space of time, or, if he be "in funds," he may discharge his liability more rapidly. The houses are well built, and are kept in good repair under the supervision of the municipal engineer, who, in turn, is overlooked by an officer who acts as the Admiralty's inspector. It is recorded that the tenants "live up" to their surroundings : there is none of the savagery which confronted an experimenter in the housing of the London poor some years ago, when the tenants indulged in such playful little habits as tearing down the wood banisters to light the fires, and diverted the water-butts from their proper purpose into drowning-places for kittens.

The low terms upon which the site for the houses was acquired—the cost not being more than ninepence per yard—would, however, make it impossible for the experiment to be successfully imitated in quarters where the facilities are not so favourable. Moreover, in Spezia labour is cheap, and this "workman's city" was erected at a far lower cost than would be possible in any English town. These are factors which tie the hands of local authorities in this country when they discuss the question.

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SPECIFICATIONS FOR PORTLAND CEMENT CONCRETE.

THE use of Portland cement concrete has long ceased to be a novelty ; thousands of tons of cement are annually consumed in its manufacture. The terminology employed in specifying its ingredients has been determined by engineers, architects, and surveyors, who are generally the most exact among men in their methods of thought and expression. It is, therefore, the more surprising that the expressions "1 to 8," "1 to 6" concrete continue to pass current without a universally-recognised meaning being attached to them. Even if all doubt were removed as to whether the "8" or "6" indicated measures of aggregate, exclusive of fine stuff or sand, the sum of the measures of both these ingredients, or measures of these ingredients after mixing the two, in no case could they indicate the ratio of cement to sand in the mortar, or the ratio of the latter (cement and sand mixed) to the aggregate of broken material. Such loose and unsatisfactory expressions should be abandoned. In their place the proportions of cement, sand, and broken material should invariably be stated in the order mentioned, and the expressions 1 : 2 : 6, 1 : 1 : 5 become generally current. It is even further suggested that the sand should be considered as part of the matrix, not of the aggregate. We should then think of concrete as a very irregular rubble with all its interstices filled with cement mortar, and with a thin joint of the same material separating every fragment of stone (or brick, &c.) from its neighbours on every side. We thus see the proportions of ingredients in the mortar (or matrix) to be used, and the ratio its quantity bears to the aggregate, in their true importance ; while the ratio of cement only to the bulk of other material appears a rather minor consideration by comparison.

That the correct proportions of cement, sand, and aggregate to be used to make the best concrete for any specific purpose is a very complex question is evidenced by the papers on the subject constantly to be met with. The conclusions arrived at by the more recent of these are sometimes somewhat subversive of time-honoured formulæ. In order that concrete should form an absolutely solid mass, the principle that sufficient sand to fill the interstices of the aggregate should be used appears, no doubt, sound. But to be more exact, sufficient mortar (cement and sand mixed with water) to do this, with enough in addition to form joints between the several nodules, as before mentioned, is what is really required. It appears undesirable that such theoretical requirements should figure in any specification, or similar document, intended for the practical direction of a contractor or working man. He requires to be told at once how he is to mix his concrete : how many measures of broken material or shingle and fine stuff respectively he is to use to each measure of cement.

Experiment and experience have shown that broken stone, on an average, contains about 48 per cent. of interstices, and shingles about 30 per cent. This means in practice 2 of sand to 4 of stone, and 2 of sand to 6 of shingle. Suppose the actual percentage of interstices determined by experiment in a particular case varies somewhat from these figures. It would be useless to tell a contractor that the sand is to be used at the rate of 45 or any other percentage of his aggregate : we must come down to the practical necessities of the case, which means 1, $1\frac{1}{2}$, 2, $2\frac{1}{2}$, &c.,

measures to his measure of cement. Here we see at once, and as will be furthur shown from a paper on the subject contributed to the *Minutes* of the Inst.C.E., specifications for concrete constantly depart from this initial theory of filling the interstices with sand; 1 of cement, 2 sand, and 6 of stone; 1 cement, 1 sand, and 6 shingle being cases in point. The latter, which errs widely in this direction, is quoted as a typical specification in a paper printed in *Professional Notes* of the Surveyors' Institution, Vol. IX., Part III. The interesting paper above referred to is by Mr. F. J. Preston, A.M.I.C.E. (*vide* Vol. CXXXII., p. 355, *Minutes* of Proceedings of the I.C.E.). His conclusions are that concrete, to contain the correct proportion of mortar, "cannot possibly be made with 6 parts of any ordinary-sized broken stone" to 2 of sand and 1 of cement, which he proves as follows:—One part cement and 2 parts sand make $\frac{(1 + 2)\,3}{4}$ = 2·25 parts of mortar; the percentage of interstices of broken stone averages 48 per cent. Hence: Mortar (as shown above) = 2·25 parts; interstices = 6 parts × 0·48 = 2·88 parts—"that is to say, the interstices are largely in excess of the mortar, and 10½ per cent. of the concrete will be made up of hollow spaces."

Mr. Preston gives the following formula for determining the correct ratio of mortar to every 100 parts of finished concrete:—

(*a*) Mortar to be mixed 1 of cement to 2 of sand, aggregate of broken stone having 48 per cent. of interstices; mortar in excess of interstices (to form thin mortar joints before referred to) to equal 10 per cent. of the aggregate. Then if—

x = aggregate without excess of mortar
$x + \frac{1}{10}x$ = 100 parts of finished concrete
and x = 90·90 parts = aggregate
Mortar in excess of interstices $\Big\} = \frac{9\cdot09}{99\cdot99}$ (i.e., 10 per cent. of x)

	Parts.
Interstices to be filled with mortar 90·9 × 0·48 =	43·63
Mortar in excess 90·9 × 0·10 =	9·09
Total mortar	52 72
To find cement add one-third	17·57
And divide by	3) 70·29
Cement one part	23·43
Sand two parts	46·86
Aggregate	90·90
	161·19

This gives a concrete (in round figures) of 1 cement, 2 sand, and 4 stone, and requires the following dry material to make a yard of concrete *in situ*, viz:—

$\frac{27}{100}$c.ft. × 23·43 = 6·32c.ft. cement
$\frac{27}{100}$c.ft. × 46·86 = 12·64c.ft. sand
$\frac{27}{100}$c.ft. × 90·90 = 24·54c.ft. stone
Total............ 43·50c.ft.

(*b*) One part cement, 2½ sand, and aggregate of shingle having 30 per cent. of interstices; mortar in excess of interstices to equal 15 per cent. of aggregate. This works out as follows:—

Cement 1 part = 14·90
Sand 2½ parts = 37·25
Aggregate = 86·95
139·10

Here we have a concrete (in round figures) mixed 1 of cement, 2½ sand, and 6 of shingle, requiring the following dry materials to a yard of concrete:—

$\frac{27}{100}$c.ft. × 14·90c.ft. = 4c.ft. cement
$\frac{27}{100}$c.ft. × 37 25c.ft. = 10c.ft. sand
$\frac{27}{100}$c.ft. × 86·95c.ft. = 23½c.ft. shingle
Total............ 37½c.ft.

It will be noticed that Mr. Preston assumes that the essential data to be determined beforehand are the ratio of cement to sand and the nature of the aggregate to be used.

Taking the two typical examples given, we see that 1 of cement to 6 (stone + sand) should be mixed 1 cement, 2 sand, 4 stone. Whether this is what is generally referred to as "1 to 4" concrete, or as "1 to 6," and whether it is strictly either the one or the other, will be considered later.

If the ratio of cement to sand remains at 1 to 2, similar concrete to the above made with shingle having 30 per cent. of interstices should be mixed with 1 cement, 2 sand, and 5 shingle (1 to 7). But 1 of cement to 6 (shingle + sand) works out at 1 cement, 1½ sand, and 4½ shingle; while 1:2:4 would give an excessive proportion of mortar.

We have already seen that 1 of cement, 2 sand, and 6 broken stone, although a very usual specification, does not satisfy the requirement that all interstices should be filled with sand, nor with mortar either. On the other hand, when using ballast or shingle, 1 cement, 2½ sand, and 6 shingle would make a very sound concrete, somewhat more economically than the usual 1 of cement to 6 of ballast, including fine stuff.

In continuation of these views, and also as showing what remarkable differences of opinion still exist among engineers as to the theoretical composition of concrete, the following extract from a paper by the City Engineer of Cologne (vide *Contract Journal* for March 22, 1899) is interesting, coming, as it does, from such an entirely different source. The author first deals with the "rational apportionment of the several ingredients of cement mortars, whether for masonry or concrete work." He treats of experiments with mortars, varying from 1 cement, 2 sand, and 0·53 water, down to 1 cement, 5 sand, and 0·64 water, and subsequently continues as follows:—"Of still greater value are these data, however, relative to the preparation of concrete. In order to obtain a certain strength it is not necessary that the quantity of mortar provided is sufficient to fill up all the interstices or pores in the concrete; the quantity at hand must suffice, however, to entirely envelop the gravel or stone chips. One frequently hears the opinion expressed that a poorer quality of mortar may be employed according as the interstices in the gravel are larger. That is entirely wrong. The volume of mortar may be limited at the expense of density, but not the proportion of sand increased. Or, inversely, greater strength may be obtained by using richer mortar. For instance, a concrete consisting of 1 part cement to 3 parts sand and 5 parts gravel (in cubic measure)—according to the quality of the sand and gravel employed—possesses the same strength as a mixture consisting of 1 cement, 4 sand, and 8 gravel; and concrete consisting of 1 cement, 3 sand, and 5 gravel, the same strength as 1 cement, 3 sand, 6·5 gravel. But the matter will be quite otherwise should density of the mortar be required. In this case the interstices in the sand must be completely filled up. Relative to different samples which I have examined, I have found differences in the interstices between the grains of dry, compact-lying sand amounting from 0·30 to 0·45 of their mass. These figures indicate plainly the amount of economy which it is possible to effect in cement—*i.e.*, up to 33 per cent. Taking a mean figure, a good mortar sand in which all sizes of grain are represented has from 38 to 40 per cent. of hollows. These must all be filled up with cement."

Notice the composition of the concretes the author deals with as, presumably, typical examples: 1 cement, 3 sand, 5 gravel (1 to 8), 1 : 4 : 8 (1 to 12), 1 : 3 : 6·5 (1 to 9½). Moreover he deprecates filling the whole of the interstices of the aggregate with sand when these are large, because the mortar (unless the proportion of cement is also increased) is thereby made too poor.

In important engineering works there is often little choice possible as to the particular sand and aggregate that will have to be used. These are determined by economical considerations as to what can be procured within a reasonable distance. The engineer in such a case would probably, *before* writing his specification, determine by experiment the proportion of sand to be added to the aggregate. But under ordinary circumstances we have sufficient data available to specify clearly what proportions of cement, sand, and aggregate we require to be used. In the case of gravel it will generally be necessary to determine how much sand is required to be added to it to complete the ratios 1 : 2½ : 6 or 1 : 2 : 7 (as the case may be) by screening out and measuring the fine stuff it already contains, as, of course, in specifying the three ingredients separately the last one must be measured quite exclusive of fine stuff. With this possible exception the cement, sand, and broken material are three distinct materials purchased separately by the contractor, who requires to know how much of each is to be used.

An expression in common use is "1 of cement to 6 of aggregate with sufficient fine stuff to fill the interstices," while current War Department schedules specify the "proportion of cement to bulk of mixed aggregate." Taking 3½ bushels of cement (4½c.ft.) as the unit of measurement, and, for example, an aggregate of broken stone containing 48 per cent. of interstices, then (*a*) if a box is made to contain 4½ × 6 = 27c.ft. of aggregate, it will certainly take more than 18c.ft. from the heap of stone + 9c.ft. from the heap of sand to fill it; and (*b*) the same box will be more than filled by 27c.ft. from the stone heap + 27 × 0·48—say 13½c.ft. from the sand heap—that is, six times the bulk of the cement of aggregate with its interstices filled beforehand with their maximum capacity of fine stuff. The stone and sand are never mixed together before being measured, and even if this were done (which would add unnecessarily to the labour, and consequently to the cost of making the concrete) it is doubtful whether this maximum proportion of fine stuff could be got into the box of 27c.ft. The only practical procedure is to make an experimental mixing of the stone and sand; fill the box, empty it, and screen out and measure the quantities of each for subsequent guidance.

To take the case of gravel or ballast already containing sufficient fine stuff. This is loosely heaped on the ground and a box as before is filled with it. If we again empty and measure the contents we shall find something less than 27c.ft. of screened stuff and 30 per cent.—say 9c.ft.—of fine stuff; but certainly more than if 4 measures (18c.ft.) of screened stuff and 2 measures (9c.ft.) of fine stuff, 6 measures in all, had been taken from two separate heaps.

Hurst's handbook gives the following generally accepted analysis of a yard of finished concrete—viz., one part, 3½ bushels, or 4½c.ft. of cement; two parts, 9c.ft. of sand; and six parts, 27c.ft., of "clean shingle, broken stone, or screened gravel."

It is not stated whether this should be called "1 to 6" or "1 to 8"; but from the foregoing it is clear that the only way we can be certain of obtaining a yard of concrete containing such a proportion of materials is by clearly specifying "1 : 2 : 6"; 1 of cement to 6 of aggregate, including fine stuff by *bulk*, will give something like a mean between the results (*a*) and (*b*) above, which, in the case of ballast or shingle, having 30 per cent. of interstices, is approximately 1 of cement, 1½ fine stuff, and 5 screened stuff, or, with stone having 48 per cent of interstices, about 2½ of sand and 5 of stone. Either of these, with the unit of 4½c.ft. of cement, will make rather less than a cubic yard, and consequently a rather richer concrete than that quoted from Hurst.

Experience proves that most contractors, and many engineers, &c., speak of 1 cement, 2 sand, and 6 stone as "1 to 8 concrete." If this were universally accepted, then "1 to 6 by bulk of mixed aggregate containing sufficient fine stuff" (for broken stone previously instanced) might equally well express—1 part, 4½c.ft., of cement; 4 parts, 18c.ft., of broken stone; and 18 × 0·48 say 9c.ft., of sand. That is, 6 parts in all of mixed aggregate containing the coarse and fine ingredients in such proportions that the interstices of the former are filled by the latter.

As a case in point, the following is extracted from a report issued by the joint committee of the representatives of the Northern Architectural Association, the Newcastle, Gateshead, and Tyne District Master Builders' Association, and the Council of the Building Trades Exchange, Newcastle-on-Tyne (being the results of certain experiments on concrete with expanded metal). The report is signed by Mr. F. W. Rich, a leading Newcastle architect, as chairman of the joint committee. "The concrete to be gauged 5 to 1. . . . . . to be composed of 4 parts clean washed gravel to pass a 2in. gauge, 1 of clean sand, and 1 of Portland cement." The intention here is clear—1 measure of cement, 1 measure of sand, and 4 measures of gravel. But assuming the one of sand is to fill 25 per cent. of interstices in the gravel, here is a "5 to 1" concrete, which is often spoken of as "4 to 1," which, as previously contended, by bulk of cement to bulk of mixed aggregate it is not exactly the one or the other.

The problem presented to the mind of the contractor (and his profit or loss depends very largely on his answering it correctly) is, "How much cement is required to make, say, 100c.yds. of concrete mixed in the several ways specified?" If, as the result of test with a given aggregate, a cubic yard requires 9c.ft. of sand to fill its interstices, this result would generally be considered as applying equally to 1 to 6, 1 to 5, or 1 to 8 concrete.

Taking as correct that 27c.ft. of aggregate, $\frac{27}{6}$ of cement, and 9c.ft. of sand (a total of 40½c.ft.)

make a yard of concrete *in situ*, we obtain the following analyses of a yard of concrete :—

(1) 27c.ft. aggregate + $\frac{27}{6}$ cement + 9 sand = $40\frac{1}{2}$c.ft. ingredients, $\frac{27}{6} \times \frac{100}{1} = 450$c.ft. of cement required for 100 yards.

(2) 27c.ft. aggregate + $\frac{27}{5}$ cement + 9 sand = $41\frac{2}{5}$ ingredients $\frac{41\frac{2}{5}}{40\frac{1}{2}}$ yds. concrete = $\frac{46}{45}$, and $\frac{27}{5} \div \frac{46}{45} \times \frac{100}{1} = 528$c.ft. cement required for 100yds., not $\frac{27}{5} \times \frac{100}{1} = 540$, as might be supposed.

(3) 27c.ft. aggregate + $\frac{27}{8}$ cement + 9 sand = $39\frac{3}{8}$ ingredients. One yard of stone cannot make *less* than a yard of concrete, but to fill the interstices with mortar in this instance the quantity of sand would have to be increased. In any case, $\frac{27}{8} \times \frac{100}{1} = 337\frac{1}{2}$c ft. cement required for 100yds. of concrete. Or, taking a different specification :—

(4) 27c.ft. aggregate of broken stone to $1\frac{1}{2}$in. to $\frac{3}{4}$in. gauges, half and half, $13\frac{1}{2}$ sand, $6\frac{3}{4}$ cement, $47\frac{1}{4}$c.ft. total ingredients.

The writer has checked by experiment that this will make $\frac{47\frac{1}{4}}{40\frac{1}{2}} = 1\frac{1}{6}$c.yds. of concrete, and 100yds. will require $\frac{6}{7} \times 6\frac{3}{4} \times 100 = 578\frac{4}{7}$c.ft. of cement, not 675c.ft., as might be supposed.

It would, however, be quite within the discretion of a superintending engineer to *reduce* the quantity of sand in example (2) and *increase* it in example (3) so that cement + sand should, in these cases = $13\frac{1}{2}$, as in example (1)—i.e., $5\frac{2}{5}$ cement + $8\frac{1}{10}$ sand in example (2), and $3\frac{3}{8}$ cement + $10\frac{1}{8}$ sand in example (3).

Example.		Aggregate in yards.	Fine stuff in yards.	Cement in feet.
II.	(a)	$\frac{45}{46} \times 100 = 97\cdot823$	$\frac{9}{27} \times \frac{45}{46} \times 100 = 32\cdot609$	$\frac{27}{5} \times \frac{45}{46} \times 100 = 528\cdot261$
	(b)	100·00	$\frac{8\frac{1}{10}}{27} \times 100 = 30\cdot00$	$5\frac{2}{5} \times 100 = 540\cdot00$

(A total of 150 yards cube in each case.)

Example.		Aggregate in yards.	Fine stuff in yards.	Cement in feet.
III.	(a)	100·00	$\frac{9}{27} \times 100 = 33\cdot333$	$\frac{27}{8} \times 100 = 337\frac{1}{2}$
	(b)		$\frac{10\frac{1}{8}}{27} \times 100 = 37\cdot500$	

(Totals of $145\frac{5}{6}$ yards cube and 150 yards cubic.)

From the same specification we thus obtain two possible analyses of 100yds. of concrete for (2) and (3).

In the making of several thousands of yards these differences would be appreciable. In example (4) it is evident more sand is specified than is necessary to fill the interstices of the stone. The joints between the stones are increased in thickness, and consequently more than a yard of concrete is made with a yard of stone and its specified proportions of cement and sand, as shown by the figures. This must be the result in nearly all instances of fine concretes, such as 1 to 5, 1 to 4, &c., unless the quantity of sand is reduced below all practical requirements. The only general rule that can be assumed as approximately correct for all ordinary concretes is that $40\frac{1}{2}$c.ft. of ingredients (screened stuff + fine stuff + cement) will make a yard of finished concrete, unless hollow spaces are left in the concrete as in preceding example (3).

To recapitulate: 1 (and best). We may specify 1 : 2 : 4, 1 : 2 : 6, &c., by which a contractor will know exactly what we require, and we shall have no difficulty in getting it. At the same time if the usual $3\frac{1}{2}$ bushels ($4\frac{1}{2}$c.ft.) of cement is taken as the unit of measurement the bulk of the aggregate including sand after being heaped together will not measure any exact multiple of the bulk of cement; we shall not necessarily get a "gauge" that will make a yard of concrete *in situ*, and to speak of such 1 : 2 : 6 concrete as either 1 to 6 or as 1 to 8 will be equally inaccurate.

2. We may specify (*a*) "1 of cement to 6 of aggregate with *the addition* of sufficient fine stuff to fill the interstices," or (*b*) "1 of cement to 6 by bulk of aggregate, the latter to contain such proportion of fine stuff as will fill the interstices." These give two quite different results, the first (*a*) being a larger bulk of aggregate than the second (*b*). With (*a*) the usual experiment will give the exact measure of sand to be added to a given measure of aggregate, but in the second a further experiment is necessary to ascertain how much sand and how much aggregate are contained in a given bulk of the two loosely heaped —i.e., filled into a box of given capacity. Bulk for bulk (*b*) will give exactly "1 to 6," (*a*) rather more than the 6 of mixed aggregate.

3. We may specify "1 of cement to 6 of aggregate, which is to contain sufficient fine stuff to fill the interstices." This will generally mean either (*a*) or (*b*) of the foregoing; but it may also be intended, and may be interpreted, to mean six measures of aggregate mixed in such proportions that the fine stuff will fill the interstices of the broken material. In this way only do we get "1 to 6" in that interpretation of the expression in which the higher figure represents the sum of the measures of each of the ingredients of the aggregate taken separately.

The amount of dry heaped material, including cement, required to make a yard of finished concrete has been incidentally mentioned. It must necessarily vary from the average amount given by Hurst—viz., 27c.ft. aggregate, 9c.ft. sand, and $4\frac{1}{2}$c.ft. cement; total, $40\frac{1}{2}$c.ft. In the analyses quoted from Mr. Preston's paper we get totals of $43\frac{1}{2}$ and $37\frac{1}{2}$c.ft., and Mr. Philip Hobbs (of the firm of W. B. Wilkinson and Co.) instances as much as 45c.ft., made up of five bushels of cement and 30 bushels of finely-crushed material "machine broken, with the proper proportion of all sizes" (vide Building News of February 21, 1896). The limits may therefore safely be put at 35 and 45, giving an average of 40. These totals are all obtained by measuring *separately* and adding together the quantities of screened stuff, fine stuff, and cement. Confusion frequently arises between this and the following methods of measurement, when it is not clearly stated which method is referred to—viz., the screened stuff and fine stuff may be measured together after mixing and the measurement of cement added, or all the ingredients may be mixed together in the dry state before measurement. Three very different results may thus be obtained from the same quantities of material. Ahr. P. Durlacher.

NOTES FROM EDINBURGH.

Another of several busy and prosperous years for the building trades of Edinburgh is passing away, and with good prospects of others to succeed it. There still remains much to be done in completing works of varied character and great magnitude—Talla waterworks, the N.B.R. station and hotel, and the reconstruction of North Bridge-street, the hospital buildings at Colinton, the T. Usher College of Sanitary Science, and others of less note. In addition to these, the gasworks are to be transferred to Granton; two new and large schools are to be erected at a cost of about £20,000 each, and it is more than likely that another large addition will be required to meet the requirements of electric light and motor force supply. The work of the past year has left its mark on the city everywhere in new streets, as well as large, independent structures. The Caledonian Railway has carried its east frontage far up the Lothian-road, for the accommodation of its offices, in a somewhat less ornate but still very stately range of buildings, a portion of which appears to be preparing for an upper floor. The N.B.R. station is still unfinished in the glazing of its roof, and the engineers are busy constructing the bridges for passenger traffic over the spacious width. The one from Calton to Jeffrey-street is carried on iron braced supports, and will be a light and elegant covered way, with nice railing. The bridge across from the Princes-street stair crosses in front of, and close to the upper part of the fine ticket-office, and mars greatly the appearance of that building. The hotel has reached the second floor of the Princes-street section, and the builders are now busy with the third floor of the remaining portion. Two shops are now occupied on the eastern side of North Bridge-street, next the High-street, and the elevations of the rest, with the Market-street frontage, are well advanced in the second and third floors. The ground floor elevations are carried out in polished red granite, severely plain in construction, with the timber-work in teak. The corner at the High-street is truncated on the ground floor, and the upper floors have the corners entire, the corbel support being a massive block of the granite with carving in relief. On the western side, the work of excavation appears to be nearing completion, the workmen of late having been employed in making an extensive excavation below ground-floor level for a tunnel and carriage way for the goods traffic to the railway station.

Not much has been done during the past year or two in church extension. A small Episcopal chapel in a quaint style of Decorated Gothic, of archaic simplicity behind, is being built in the Gorgie-road for the Tynecastle district, and a new U.P. Church and one for the Established Church in the East-road, between Edinburgh and Leith. The former is in the Gothic style, with a galleried interior.

With so much work in hand and in prospect, it is not to be wondered at if the Usher Hall is never heard of. The site has been scheduled, and warning given to tenants to quit in Torphichen-street; but whilst the interest on the gifted sum accumulates, the temptations to, or arguments for, delay are many and great. Meanwhile the city gets on well enough without it, as it has done in the past; the McEwan Hall having been found very serviceable for musical rehearsals.

The only department in which there is likely to be any falling off is that of speculative building in the way of tenements of artisan dwellings. The increase here has been unprecedented for the last two years, and must indicate a large accession to the working population—which may not be permanent—as there does not appear to have been any great addition to the industries or manufactures of the city. The high wages and rise in almost all materials makes it necessary to study great economy of construction of arrangement, and yet satisfy all the sanitary conditions required by the Dean of Guild Court. Probably it is owing to this that in some cases these ranges of tenements have adopted the plan of the flat asphalte roof. Some of these—very conspicuous on nearing Edinburgh by N.B.R.—have a strange, unfinished aspect beside the slated roofs, being without parapets, apparently, or other safeguard, which would seem to be a necessary adjunct to be insisted upon by the authorities. Others, however, have balustrade and parapet, which greatly improves the appearance. Asphalte as a roofing material has been more in use of late; but the prejudice against it, with all its advantages as a non-conductor of sound and heat, has been great, owing to unsatisfactory results appearing after some time in the disruption of the material. The asphalte employed here is generally known as Limmer or German asphalte, and as there are many brands bearing this name, it is likely that some of these owe their existence to the ingenuity of the German chemist, and are not made from the native rock and by Nature's chemistry at all. The Seyssel and Val de Travers are beyond suspicion in this respect; but they are, owing to cost of transit, more expensive. They are employed for the best work. A very good sample of Val de Travers paving can be seen, and its comfort under foot experienced, at Queen's-buildings in Princes-street. The N.B.R., having to construct a roadway over the south side of their property at Market-street, have laid a costly layer of this asphalte under all the granite setts. The Seyssel asphalte has also been laid in roofs with satisfactory results. Generally, however, and in all new trottoirs, the pavement is completed in granite-faced Portland cement concrete, and the art of making this (first tried with success by Stuart and Co.) is now successfully carried out by master plasterers, &c.

For some years past the statistics of the health of the city have shown a stationary result; the average annual mortality being 17 to 18 per 1,000.

The history of the architectural progress of the city during the century about to close, in its general features, is fairly described in the leading article of the last issue of the Building News, as the city's architecture generally follows the course of architecture in the South. In the early years, all architecture worthy of the name was modelled on proportions and details gathered from a faithful study of the Five Orders. Edinburgh had great advantages for producing the best examples in its width of fine-ground sandstone, and the "Modern Athens" was an appellative note worthy of a city enriched by the genius of Adams, Playfair, Hamilton, and others. The influence of the Gothic revival was apparent in many ways after the middle of the century, though at first it found its only sphere in churches and houses erected in some form of the Later Gothic. But it set aside, perhaps for good, the authority of the sacred orders; and thereafter the Classic architecture has taken all kinds of liberties with the rules of proportion, and the details of the stereotyped Renaissance and the Grecian temples. A great many of the most costly architecture of recent years seems to have gone for inspiration to the French Classical style, with its florid details. The Queen Anne has made only a slight impression on the city, and mostly in private houses, or in furniture, or in the details of the showy shop front. Two examples form prominent features in St. Andrew-square. One on the west has twin gables, with suggestions of the border hills, and the other on the north side is surmounted with a range of similar Flemish gables, each with its semicircular-pediment, heavy enough to suggest that the gable has been built for the pediment, rather than the pediment having been designed to ornament the apex of a gable. The pilasters are merely ornamental strips, having apparently no function as pilasters. These and other somewhat fantastic developments and details of what is called Queen Anne style do not commend themselves to the common sense of Scotchmen. Even in works modelled on the old Classic lines, the lack of careful and patient study of the proportions, so minutely detailed in old architectural works, is generally apparent. In the fine, but only partly finished, building of the Standard Insurance Co. in George-street, the pediments of the central block and proportions and spacing of the windows are such as to invite contrast with the pediments of older and earlier work. The pillars of the central portion also are engaged, and lose all the beautiful effects of the prostylar column. It is more than likely, however, that the exigencies of the roof and the economies required by the site, have conditioned what would have been thought great irregularities in 1800.

In church architecture the Gothic revival has made great way, and at one time appeared likely to oust its Classical rival; but of late the requirements of a large galleried interior have led to a return to the Classical style, as in the reconstructed St. Cuthbert's and others, the long and lofty pillared aisle interior, as well as the long and lofty unpillared interior, having proved most unpleasantly defective in acoustics. About the middle of the century, the Gothic, in the form of the Scotch Baronial, added some good specimens of street architecture, as in Cockburn-street and the buildings of the last great improvement scheme, and also in many private villas and tenements. North Bridge-street, when completed, on the west side will be a very notable example of modern Classical architecture, not without features akin to the Baronial, and so a fitting link connecting the old town and the new. The only secular building in Gothic is the National Portrait Gallery.

It should be noted also that the recent introduction of red freestone has in no respect improved the architecture of any street when considered as a whole.

Plans have been presented to the Skirlaugh Rural District Council which will involve the completion of the doubling of the Hornsea line railway. The North-Eastern Railway Company will promote a Bill in Parliament next year to enable them to make alterations and extensions at Hornsea, Ellerby, Withernwick, and Hatfield Parva.

St. Luke's Church, Barton Hill, Bristol, which has undergone considerable alterations and improvements, was reopened last week. The walls, which formerly were whitewashed only, are now decorated in colour with frescoes and figures of the saints, whilst the dilapidated flooring has given place to substantial wood blocks, and new seats are provided. The ventilation and warming of the building have also been rendered complete, and the improvements also include a newly-tiled lobby and a vestry.

A Bill for incorporating the Leeds City and Suburban Railway Company has been deposited for next session in the Private Bill Office of the House of Commons. Powers are sought to construct eight sections of railways, which, taken together, will form a line commencing by junctions with the Hunslet branches of the Great Northern and North-Eastern Railways, and terminating at Shadwell. The aggregate length of these railways is given in the Bill at 9¼ miles, and the route of the proposed line will be through Potternewton, Chapel-Allerton, and Roundhay to Shadwell, where it will terminate at the west side of Hobberley-lane. The capital of the company is fixed at £1,200,000.

HUDSON AND KEARNS' DIARIES.

THERE is but one difference in the admirable diaries and blotting-pads issued by Messrs. Hudson and Kearns, and that is the date of the century. The nineteen hundreds will bring us many novelties and wonders, but no year among them all will see these useful and indispensable desk aids out of date. We doubt if any further real improvement is possible. Well may grateful architects and builders, who waited years for these invaluable office adjuncts, doubt if the passing century, at any rate, may not always claim as its best boon to them the introduction and gradual perfection of Hudson and Kearns' diaries and desk-pads. The different varieties are provided as usual—two forms of diary for architects and one for builders, all up to date as ever.

BOOKS RECEIVED.

The Prevention of Factory Accidents, by John Calder, Whitworth Scholar, &c. (London: Longmans, Green, and Co.), is an account of the accidents in manufacturing industry, dealing also with the law on the safe guarding, safe working, and safe construction of factory machinery, plant, and premises. Mr. Calder's experience as a factory inspector has enabled him to practically discuss these questions, and to set forth in tabular form the statistics of casualties. The tables, numbering 20, give summaries of persons engaged in factories and workshops, the extent of textile industries, reported accidents in factories, degree of injury, age and sex during successive years from 1895 and 1899. The legislation affecting the subject, dating from 1878 to 1895, is succinctly explained, and the results given. In the 221,000 factories and workshops in the United Kingdom, about 4½ millions of men, women, and children are engaged, and these are distributed amongst various works. The textile factories alone number 10,000, and employ an average of 108 persons. The non-textile factories number 84,000, and have an average of 35 persons, the actual numbers for individual factories ranging from 1 to 4,000 persons. The first quoted number of factories (221,000) is under the Act of 1878. One of the tables shows a monthly chart of fatal accidents in factories from 1896-1898. From this chart it appears there is a minimum of fatal accidents in August; but the accidents rapidly increase during the autumn and winter months, attributable partly to diminishing light, and reach their maximum in the month of December, from which point they again decline, and this maximum was greatest in 1898, but a lower accident total for the first few months of the year than those for 1897 and 1896. The chart of accidents in factories 1896—1898 shows the fatal and more serious combined. In the latter year the maximum is reached during October and November, rising rapidly from August, the accidents in which month is greater than usual. This chart shows a large number of accidents during the last six months of the year. The Act of 1895 lowered the number of these accidents, many of them due to power machinery vats, explosions of gas, steam, &c. The author classifies injuries. The causes of factory accidents are recounted as due partly to ignorance of forces and mechanical arrangements, such as the stresses set up by speed of rotation in shafts, of the construction of hand winches, of expansion joints. Carelessness, unsuitable clothing, bad lighting, defects of machinery and structures, want of safeguards, have also contributed to accidents. The safeguarding of prime movers required by the law, such as the rail-fencing to vertical and horizontal engines, is described and illustrated, and several improvements are shown in mill-gearing protection; hoists and lifting tackle, cranes, goods hoists, the safeguarding of dangerous machines; several remedies and guards are illustrated. Fire risks and accidents are also described, and means of safety by railed ladders and balconies. First aid in case of injuries is another useful chapter, and the remainder of book gives the text of the law on accident and safety under the Factory Acts. The work should be read by all owners of factories, workshops, engineers, and manufacturers.——*Quantities and Quantity Surveying*, by W. E. Davis, surveyor (London: D. Fourdrinier, *Builder* Office, and Whittaker and Co.), is a reprint of a series of article that have appeared in the pages of our contemporary. Mr. Davis's book is a practical rather than a theoretical treatise on the subject, the author's own practice being followed. Some of the methods adopted will perhaps hardly meet the views of some quantity experts, though, as a guide to the student and young architect, who wishes to acquire the art of quantity surveying in a practical form, the book will be found useful. Examples of "taking off" and abstracting of a plain kind are given, such as one finds in quantities for ordinary buildings, avoiding the details of any elaborate work, for which other treatises must be sought.

CHIPS.

The Board of Trade have confirmed an order authorising the construction of light railways in Kent, between Cranbrook and Tenterden, in extension of the Rother Valley (Light) Railway.

Mr. R. H. Bicknell, M.I.C.E., one of the inspectors under the Local Government Board, held an inquiry at the town-hall, Burslem, on the 14th inst., with respect to an application of the town council for the issue of a provisional order under the Public Health Act, 1875, partially to alter the Burslem Gas Act of 1877, in order to enable the corporation to acquire a piece of land about 11,050 acres in extent, for the purpose of enlarging the gasworks. The council also asked for powers to borrow additional money to carry out the work.

The directors of the London and South-Western Railway Company have decided on the site of their new graving dock at Southampton, and plans and estimates are being prepared. The site selected is on the western boundary of the company's dock estate. The new docks will be 800ft. long; but otherwise it will be of similar dimensions to the Prince of Wales' Dock.

At Darlington a new Wesleyan chapel is to be built at East-road, the existing structure being no longer suitable. The plans provide for nearly a thousand worshippers, and the outlay is £3,000.

The Bishop of Reading has dedicated at Hambledon, Bucks, a block of buildings given by the Hon. W. F. D. Smith, M.P., comprising National schools and a home of rest for aged persons of the parish. The buildings have been provided at a cost of £6,000.

M. Berlier, a French engineer, has drawn up a plan for a tunnel under the Straits of Gibraltar to be connected with a railway from Tangier to Lalla Maghnia, and this to be connected with the Algerian lines. He estimates the cost of the tunnel, 25 miles long, at 123,000,000f., and that of the Tangier railway at 118,000,000f. The Spanish Government has given its approval.

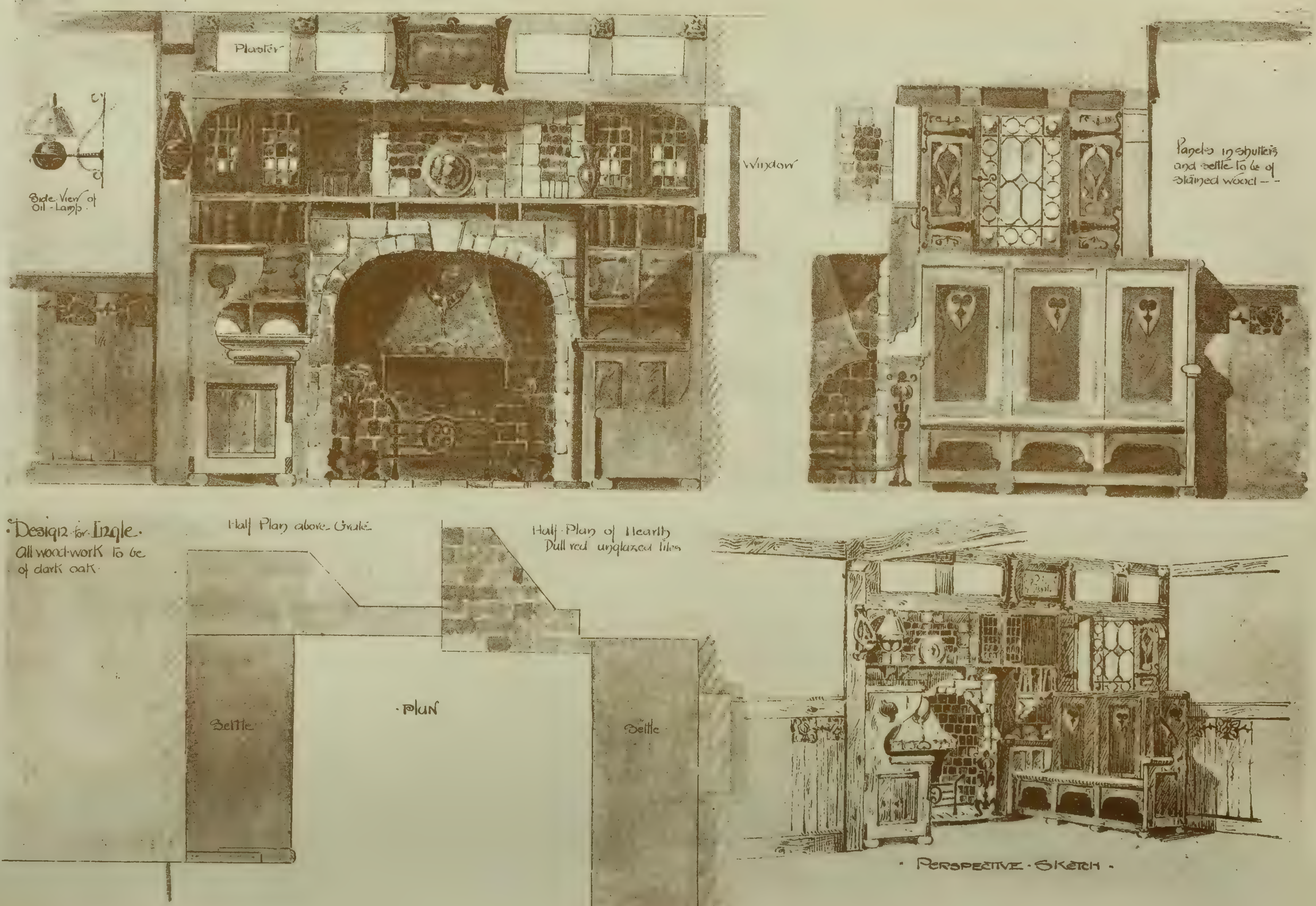
A circular has been issued by the Home Office to the manufacturers of china and earthenware setting forth the further steps he proposes to take with a view to securing the protection of the workers from the danger of lead poisoning. The working of the special rules established last year has, it is stated, resulted in a considerable reduction in the number of cases of lead poisoning.

As showing how rapidly Leeds is developing, it is stated that since June last the highways committee have paved and flagged 85 new streets on estates in various parts of the city which have recently been laid out for building purposes, that they have now work on hand in connection with the paving and flagging of 163 new streets. The committee accepted at their last meeting tenders for paving and flagging a number of new streets in the Headingley and Holbeck districts.

The east window in the new chancel of Pensax Church, Worcestershire, has just been filled with painted glass, designed and executed by Mr. Christopher W. Whall. In the centre is a group representing our Lord "receiving sinners and eating with them." This is surrounded by six panels depicting the parables in the 15th chapter of St. Luke's Gospel.

A chimney-stack in connection with the gashouse at H.M. Prison at Wakefield needed some repairs, and two men, named Herbert Stead Normington and William Carter, were engaged on the work last week. A scaffold had been fixed, and whilst the men were standing upon it at the top of the chimney, which is about 200ft. in height, the scaffolding gave way, and the two men were precipitated to the ground, and killed. Both the men came from Great Horton, near Bradford. Normington was 25 years of age, and Carter 45.

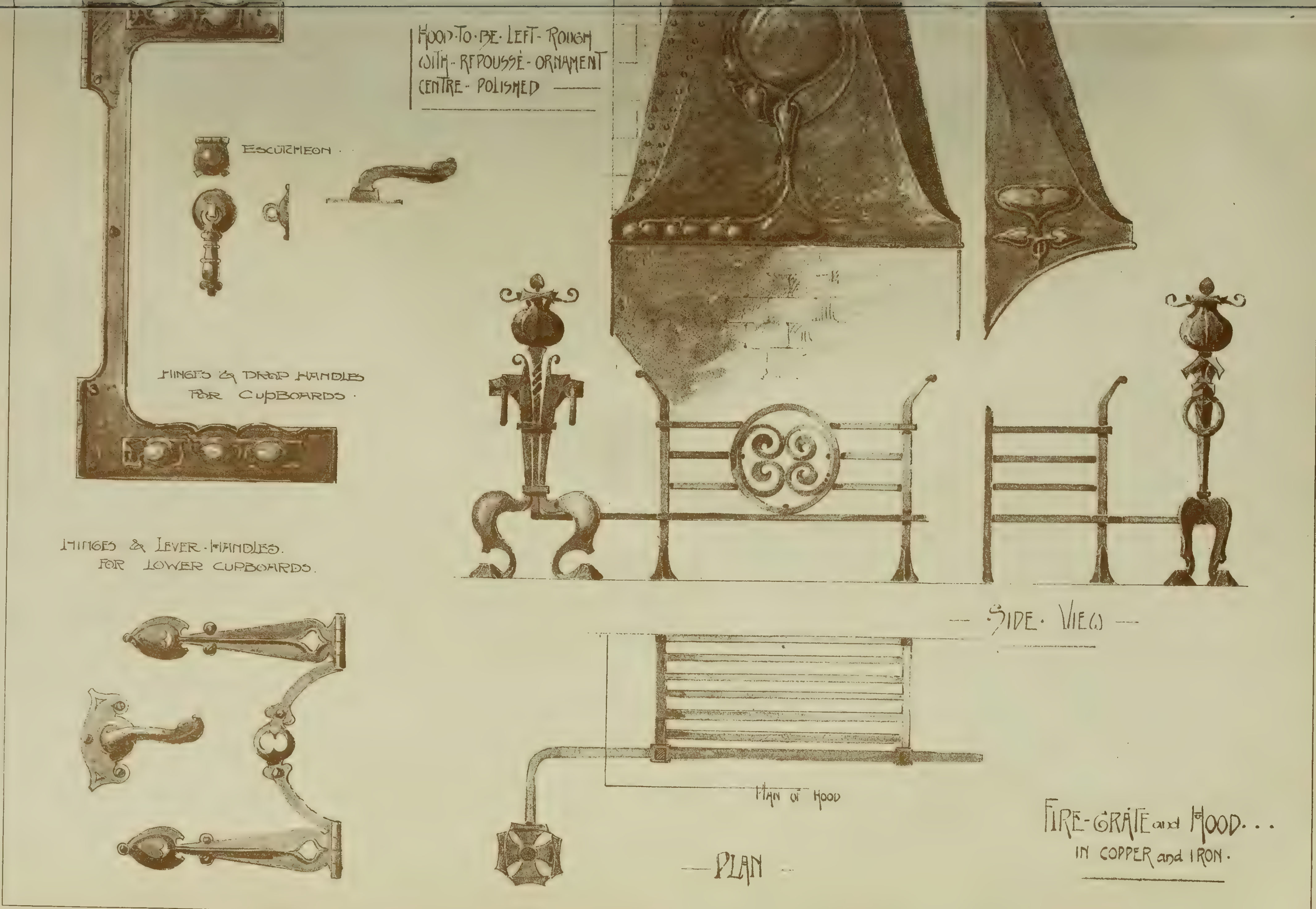
Formal approval has been given by the town council of Aberdeen to the Police and Improvements Bill and to the Tramway Extension Bill, which are to be promoted in Parliament next session. A prominent feature of the Improvements measure is the power taken to regulate the width of streets and to prevent jerry-building; while the object of the Tramways Bill is to run lines into three new districts, and to obtain power to work the system by electrical haulage.



Plaster
Side View of Oil-Lamp
Window
Panels in shutters and settle to be of stained wood
Half Plan above Grate
Half Plan of Hearth Dull red unglazed tiles
Settle
PLAN
Settle

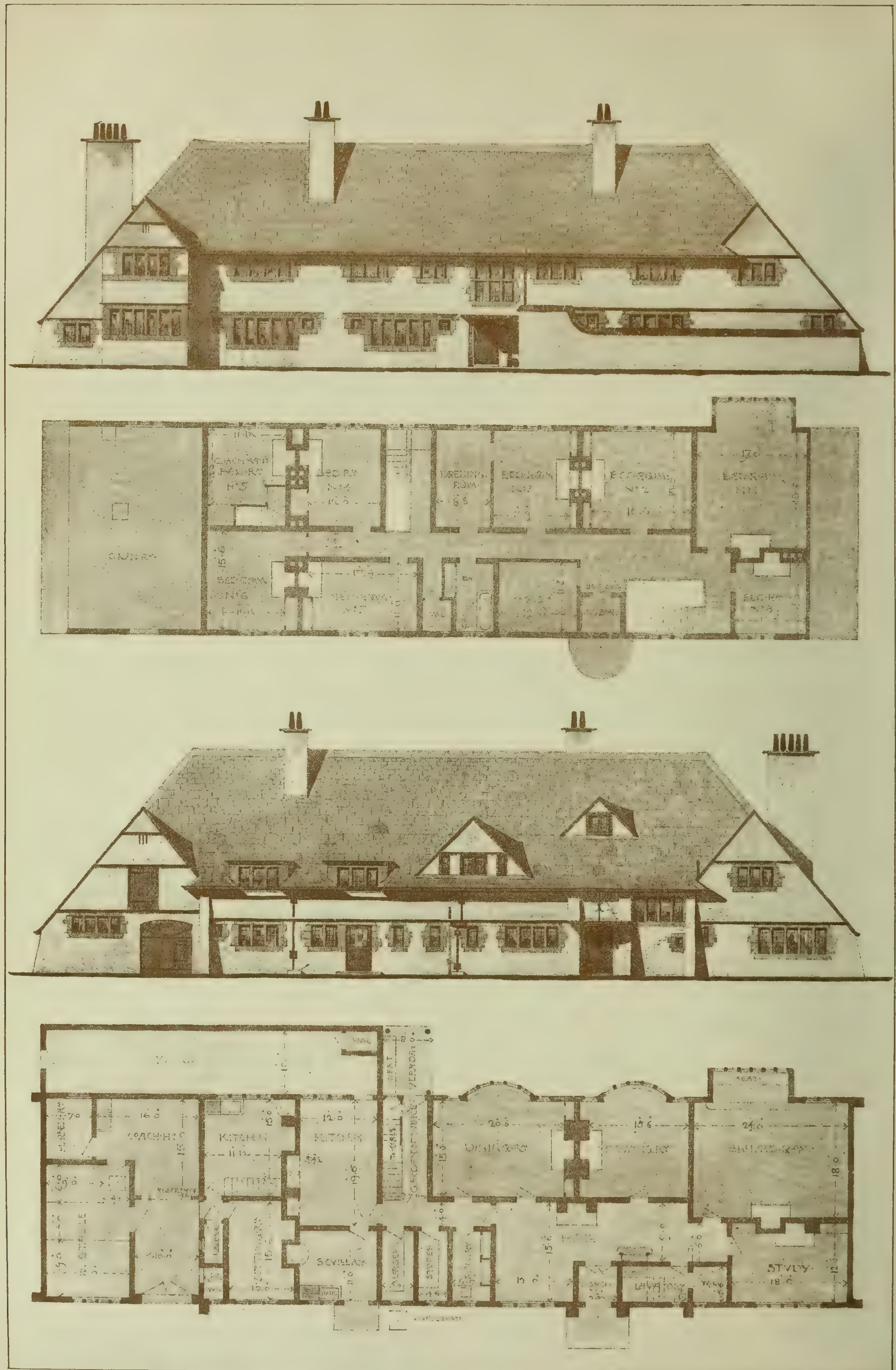
Design for Ingle.
All wood-work to be of dark oak.

· PERSPECTIVE · SKETCH ·



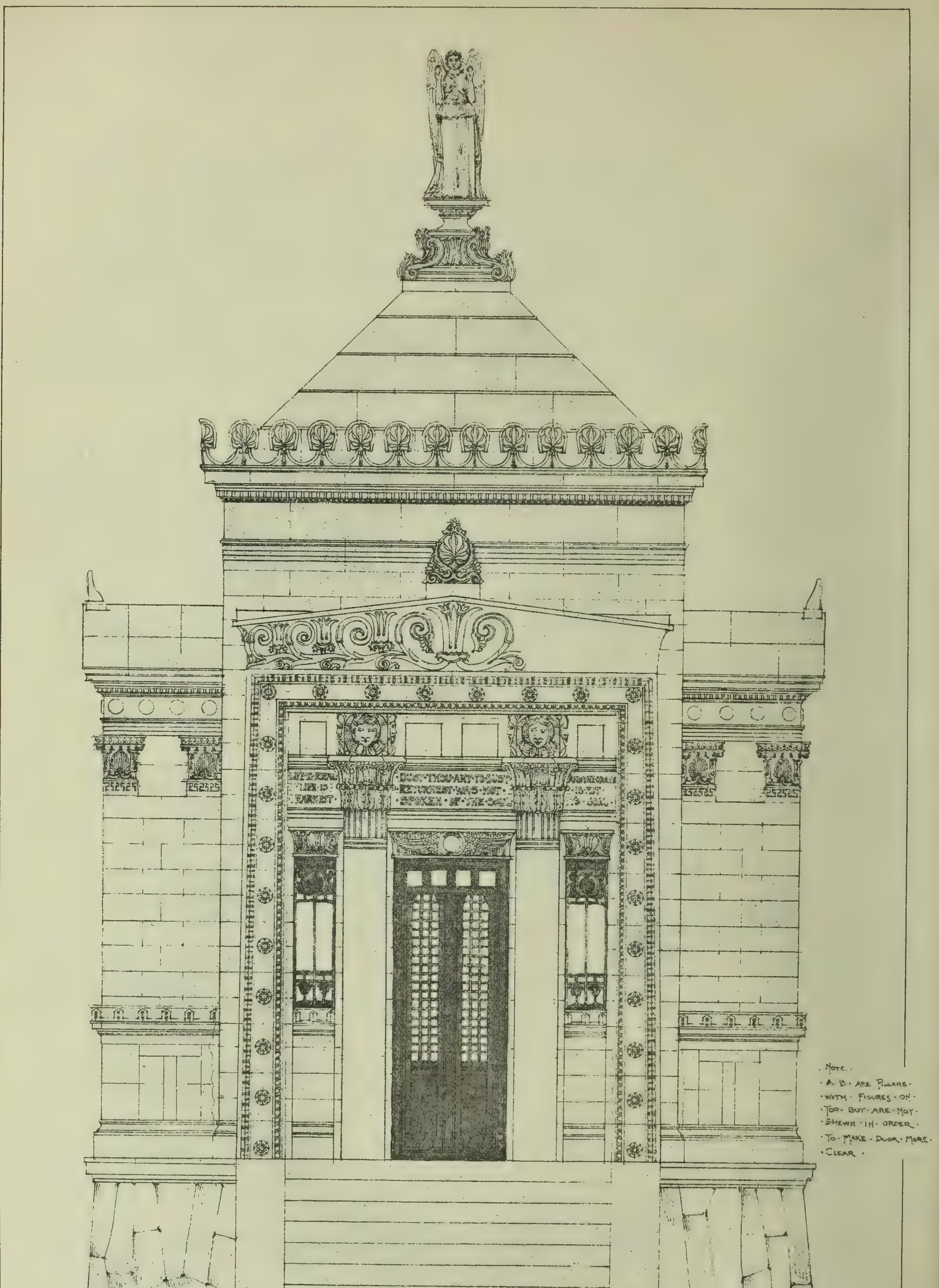
"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

NATIONAL SILVER MEDAL DESIGN FOR AN INGLE NOOK BY JAMES·A·JONES·



"PHOTO-TINT" by James Akerman 6 Queen Square London W.C.

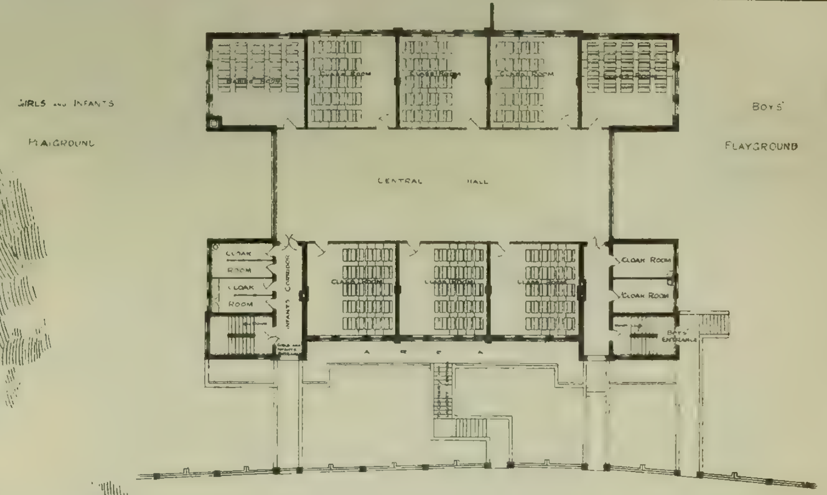
DIXCOT TOOTING FOR R·W·ESSEX ESQ: C·F·A·VOYSEY·ARCHT



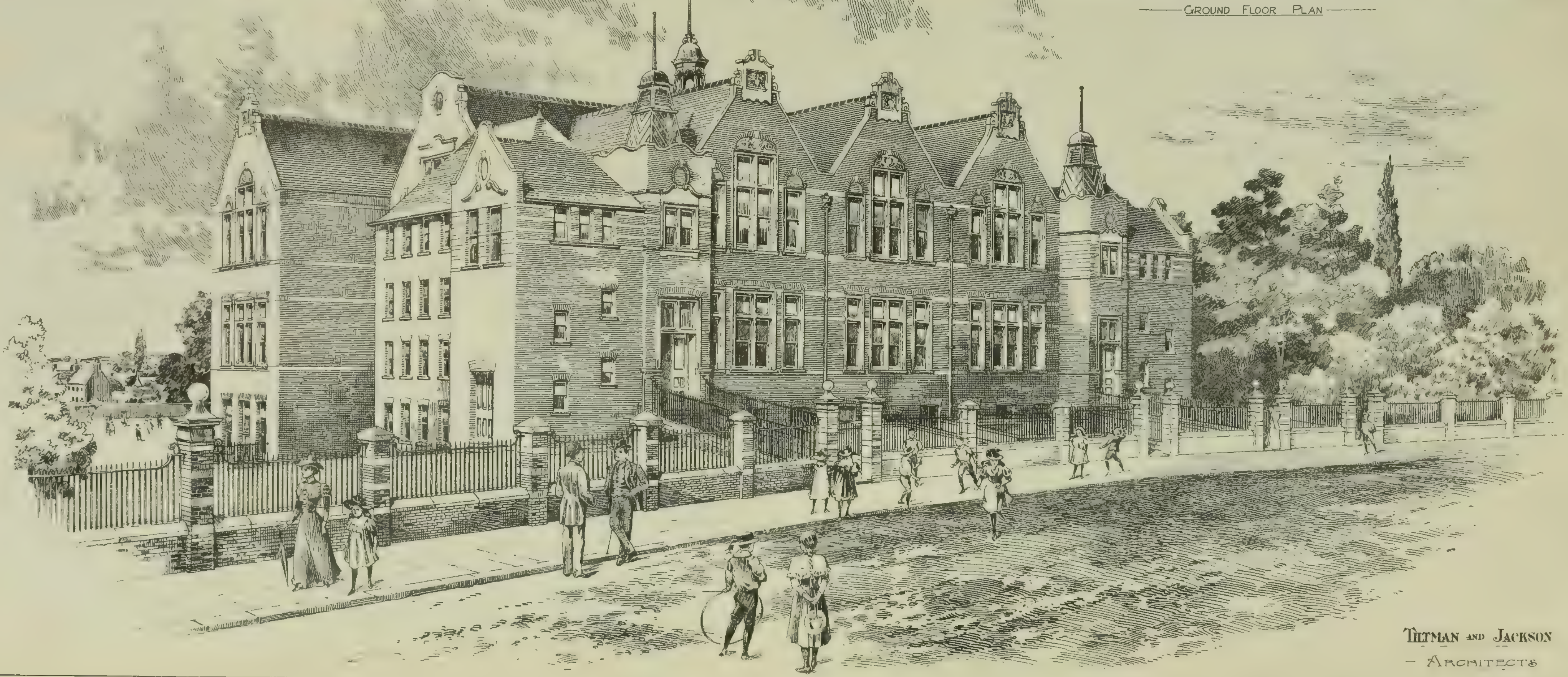
"PHOTO TINT" by James Akerman 6 Queen Square London W.C.

NATIONAL SILVER MEDAL DESIGN FOR A MAUSOLEUM BY A·M·GARDNER

NEW BOARD SCHOOL & SWIMMING BATH.
Ashgate Road, CHESTERFIELD.



GROUND FLOOR PLAN

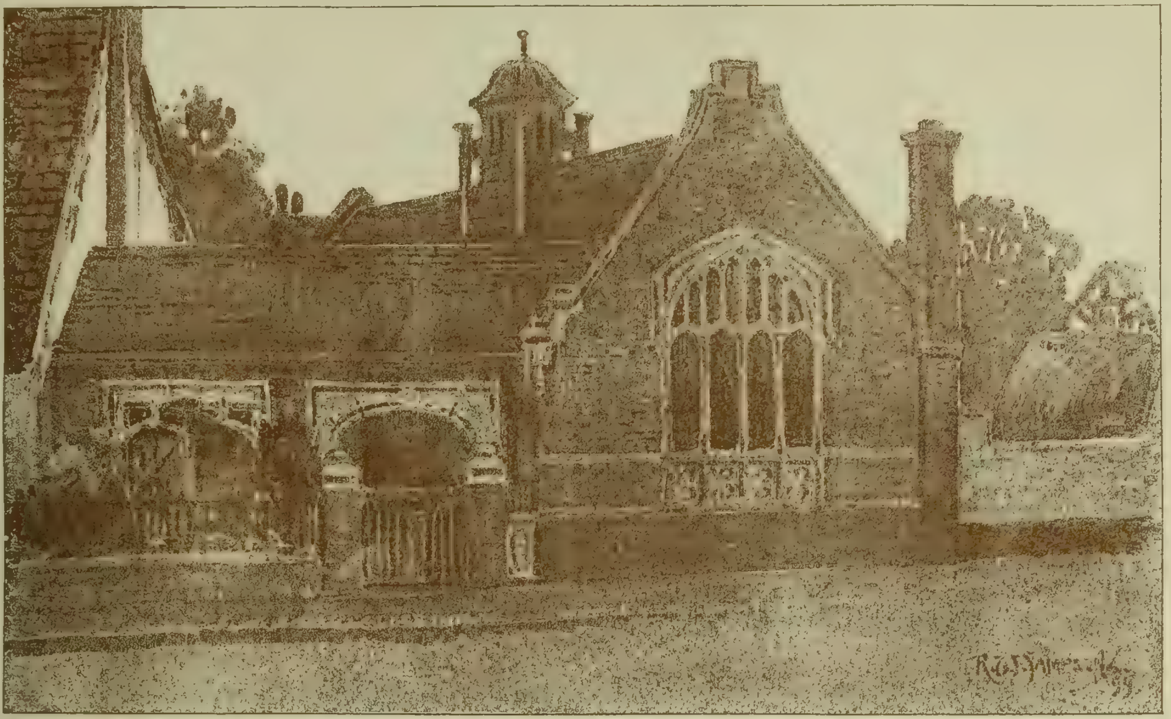


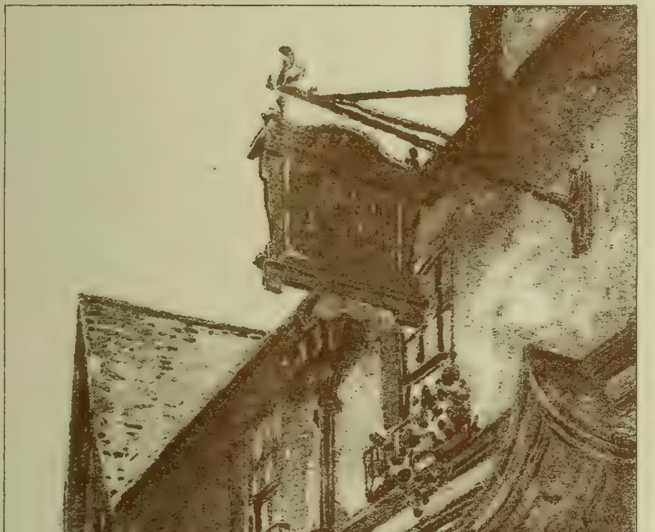
TILTMAN AND JACKSON
– ARCHITECTS

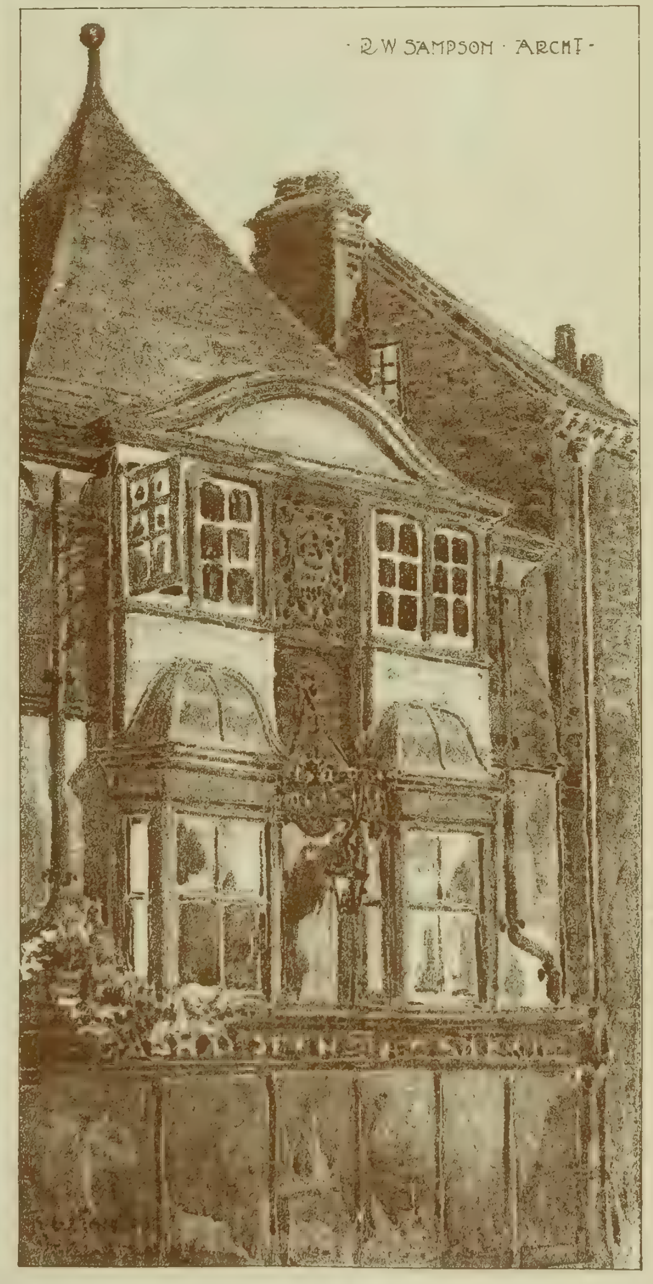
Photo-Lithographed & Printed by James Akerman 6 Queen Square W.C

ADDITIONS AND ALTERATIONS AT SIDMOUTH

SCHOOL ROOM OLD MEETING HOUSE





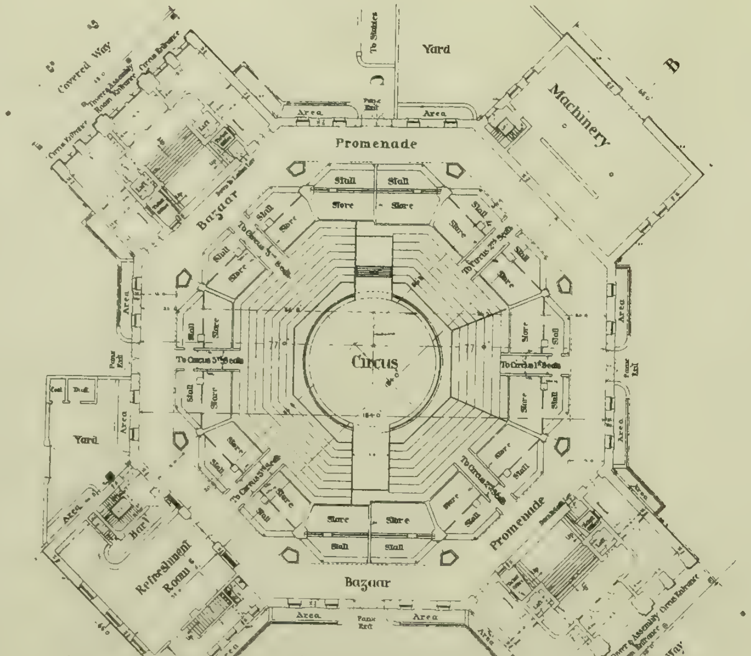

R. W. SAMPSON ARCHT.

GROUND FLOOR AND SIGN CHURCH ST.

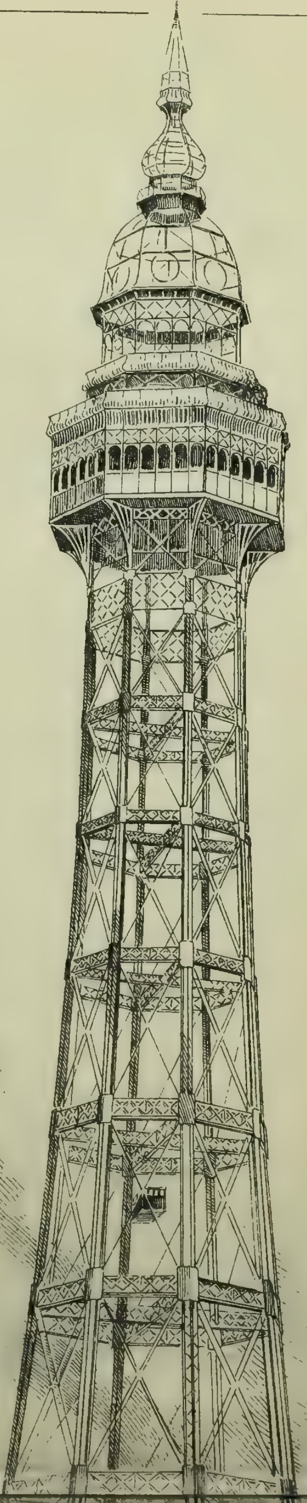
"PHOTO-TINT" by James Akerman 6 Queen Square London W.

NEW TOP STOREY FORE ST.

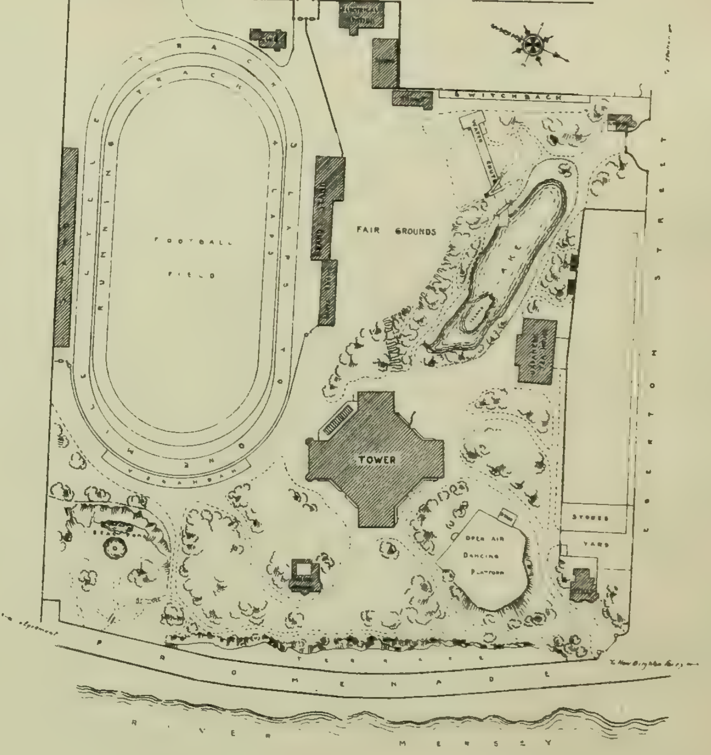
NEW BRIGHTON TOWER

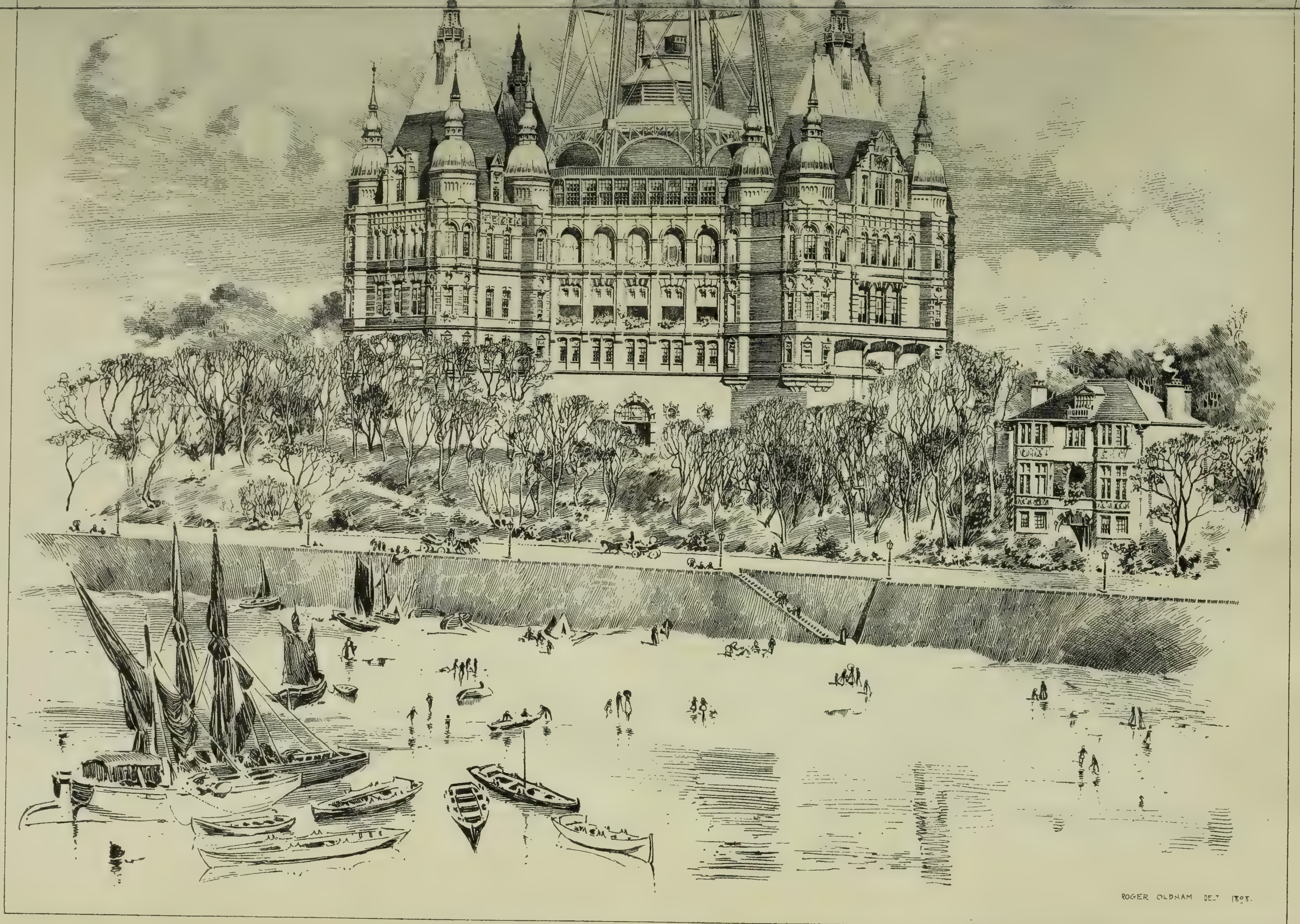


GROUND FLOOR PLAN



PLAN OF GROUNDS




ROGER OLDHAM DELT 1898.

·NEW BRIGHTON TOWER· MAXWELL AND TUKE ·ARCHTS

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ILLUSTRATIONS.

NEW BRIGHTON TOWER.—NATIONAL SILVER MEDAL DESIGN FOR AN INGLE NOOK.—"DIXCOT," TOOTING.—ADDITIONS AND ALTERATIONS AT SIDMOUTH—NEW BOARD SCHOOL AT CHESTERFIELD—NATIONAL SILVER MEDAL DESIGN FOR A MAUSOLEUM.

Our Illustrations.

THE NEW BRIGHTON TOWER.

The New Brighton Tower and Recreation Company, Limited, purchased the Rock Point Estate, situate at New Brighton, in the county of Chester, near Liverpool, and comprising about 30 acres of land, and have erected thereon a tower with entertainment buildings around its base, a three-lap to the mile cement cycling track, a quarter-mile running track, football ground, grand stand, popular stands, &c., divers sideshows, water chute, refreshment-rooms, band stands, kiosks, and dancing platform, all of which are shown on the block plan we reproduce, and perspective drawing of the tower and main buildings. The tower is built of mild steel, is 550ft. high above the ground, and weighs 2,249 tons. This steelwork and the whole of the ironwork and steelwork in the buildings was supplied and erected by Messrs. Andrew Handyside and Co., Ltd., of Derby. The tower is octagonal in form, and above the buildings surrounding, it is of framing in light lattice work, so as to lessen the wind-pressure and to give a light and elegant appearance. It is capable of accommodating over 1,000 persons on the various floors at the top of the tower, and, as designed by the architects, four electric elevators can ascend the tower at one time. Only two have been erected up to now, and they were erected by Messrs. Easton, Anderson, and Goolden. In addition to these lifts there is a staircase and ladder way for workmen from the top to the bottom of the tower, and arrangements have also been made so that should any elevator get fastened the passengers can easily be transferred to one of the other elevators at any portion of the ascent. The buildings round the base are composed of red Ruabon brick, with terracotta and Runcorn stone dressings. In the basement are large cellars, bottling stores, and artists' dressing-rooms. On the ground-floor level, immediately under the centre of the tower, there is a theatre arranged on the amphitheatre form, with one of the largest stages in the kingdom, with promenade gallery. There are also refreshment-rooms. On the mezzanine floor are the kitchens and lavatories, with large storerooms. On the first floor is a large octagonal dancing-room, with stage capable of being used for variety performances, and opening out of the dancing-room is a large refreshment-room. Above this dancing-room is the elevator hall, from which the ascent of the tower is commenced, which is all laid out with stalls in the form of a fancy fair, with shooting bungalows, &c., and above this again is an open promenade, from which extensive views of the surrounding country can be obtained. The entrance and exit accommodation is ample, as there are four main flights of stairs from the ground level to the top of the buildings, each 10ft. wide, with numerous stalls and landing places therein. The whole of the buildings were carried out by Messrs. W. A. Peters and Sons, contractors, Rochdale. Lodges and offices have also been built on the estate, and the whole work was carried out at a cost of over £200,000 within the short space of eighteen months, under the able superintendence of Mr. John Ashley as clerk of works. The architects and engineers for the whole work were Messrs. Maxwell and Tuke, Corporation-street, Manchester.

NATIONAL SILVER MEDAL DESIGN FOR A MAUSOLEUM.

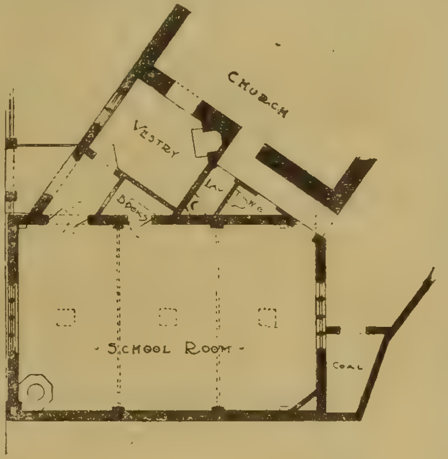
(For description and sketch see p. 869.)

"DIXCOT," TOOTING.

I have nothing to say about my design for "Dixcot," Tooting, except that my client wanted me to add 18in. to the height of the windows without altering my design, which, of course, I declined to do, so the house is being built by another man. For the sake of economy I was proposing to use 9in. brick cement rough-cast for the walls. The roof was to be of green Westmoreland slate, with lead hips and ridges. The window and door dressings, Monk's Park stone with iron casements. C. F. A. Voysey.

SCHOOLROOM, ETC., OLD MEETING HOUSE, SIDMOUTH.

The Old Meeting House is the style preferred by the worshippers for what is generally known as the Unitarian chapel. The new schoolroom and vestry, with lavatories, &c., were erected on an irregular site adjoining the chapel at a cost of about £340, by Messrs. R. W. and J. Skinner, builders, of Sidmouth, the walls being of local red bricks with Bath stone dressings, local tiles being used on the roof. Clear glass is used in leaded lights to all the windows. The floors are wood block. The schoolroom has teaching accommodation for about 150 children.



NEW TOP STORY IN FORE STREET, SIDMOUTH.

This is a more or less interesting addition from the fact that the house on to which it was added was an extremely flimsy structure, and but for the fact that it would have seriously interfered with the business of Messrs. Colebird and Co., chemists, who own the premises, it would most likely have been taken down to the ground; but, as it was, four iron columns were erected, one at each corner of the block, going right through the two existing stories, and the new story built on girders carried by these columns or legs. The cost of this work was about £350, and was carried out by Messrs. R. W. and J. Skinner, builders, of Sidmouth.

GROUND FLOOR AND SIGN, CHURCH STREET, SIDMOUTH.

This is in Chapel-street, and not, as described, in Church-street. The premises consisted of two cottages of very ordinary type, and the alteration consisted in practically remodelling the ground floor suitable for the business of a public-house. The cornices and canopies shown are of wood, the rest of the front being finished in cement. The work was executed for Mr. Geo. Vallance, brewer, of Sidmouth, by Mr. J. G. Northcote, builder, of Sidmouth. The architect of this, and the two preceding, is Mr. R. W. Sampson, of Sidmouth.

THE CENTRAL BOARD SCHOOL AND BATHS, ASHGATE ROAD, CHESTERFIELD.

The building shown by the view and ground-plan illustrated in this issue is now in course of erection for the Chesterfield School Board, from the designs and under the superintendence of Mr. A. Hessell Tiltman, F.R.I.B.A., London, and Mr. W. Cecil Jackson, of Chesterfield, as joint architects. A feature of some novelty in the scheme is the provision of swimming and ablutionary baths specially arranged for the duly regulated use of the scholars, and otherwise occasionally by the outside public. This is below the school. The accommodation is for 1,191 children—the infant section on the ground floor, and a mixed school over—on the first floor. The materials used are Ellistown bricks for the facings, with dressings of Peasonhurst stone and terracotta; roofs are slated; floors are of steel and breeze concrete, finished with wood-block flooring, and there is the usual proportion of glazed-brick dadoes, &c.

NATIONAL SILVER MEDAL DESIGN FOR AN INGLE-NOOK

All woodwork to be of oak, stained dark or left plain; all plaster toned with some soft neutral tint. Panels in settle to be inlaid with stained woods, also panels in shutters to leaded window, which has wrought-iron hinges; heart shapes under ledge also to be inlaid with wood, stained green. Cupboard hinges of *repoussé* copper, and handles to be of copper or unlacquered bronze. Fire-basket and dogs of wrought iron, dogs having forged heads and copper ornament on top. Hood of sheet copper riveted together and broadly beaten, and not planished, except tops of raised portions. The emblematic design over recess to be *repoussé* copper, with frame of sheet iron cut out, and scrolls turned up. Hearth to have dull, unglazed tiles. James A. Jones.

CHIPS.

The Wesleyan General Chapel Committee has sanctioned the erection of ten new chapels in various parts of the country at an estimated expenditure of £22,500.

A scheme of waterworks extension is being carried out at Torrington for the town council. Mr. Baldwin Latham is the engineer, and Messrs. Dart and Pollard are the contractors.

The Board of Trade have recently confirmed an order authorising the construction of a light railway in the county of Caithness, between Wick and Lybster.

The Edinburgh School Board have accepted estimates for the erection of a new building for the infant department at North Canongate School, amounting to £15,470.

At the last meeting of the Warwick Board of Guardians, the buildings and infirmary committee recommended the erection of two new blocks of infirmary buildings, at an estimated cost of £9,000.

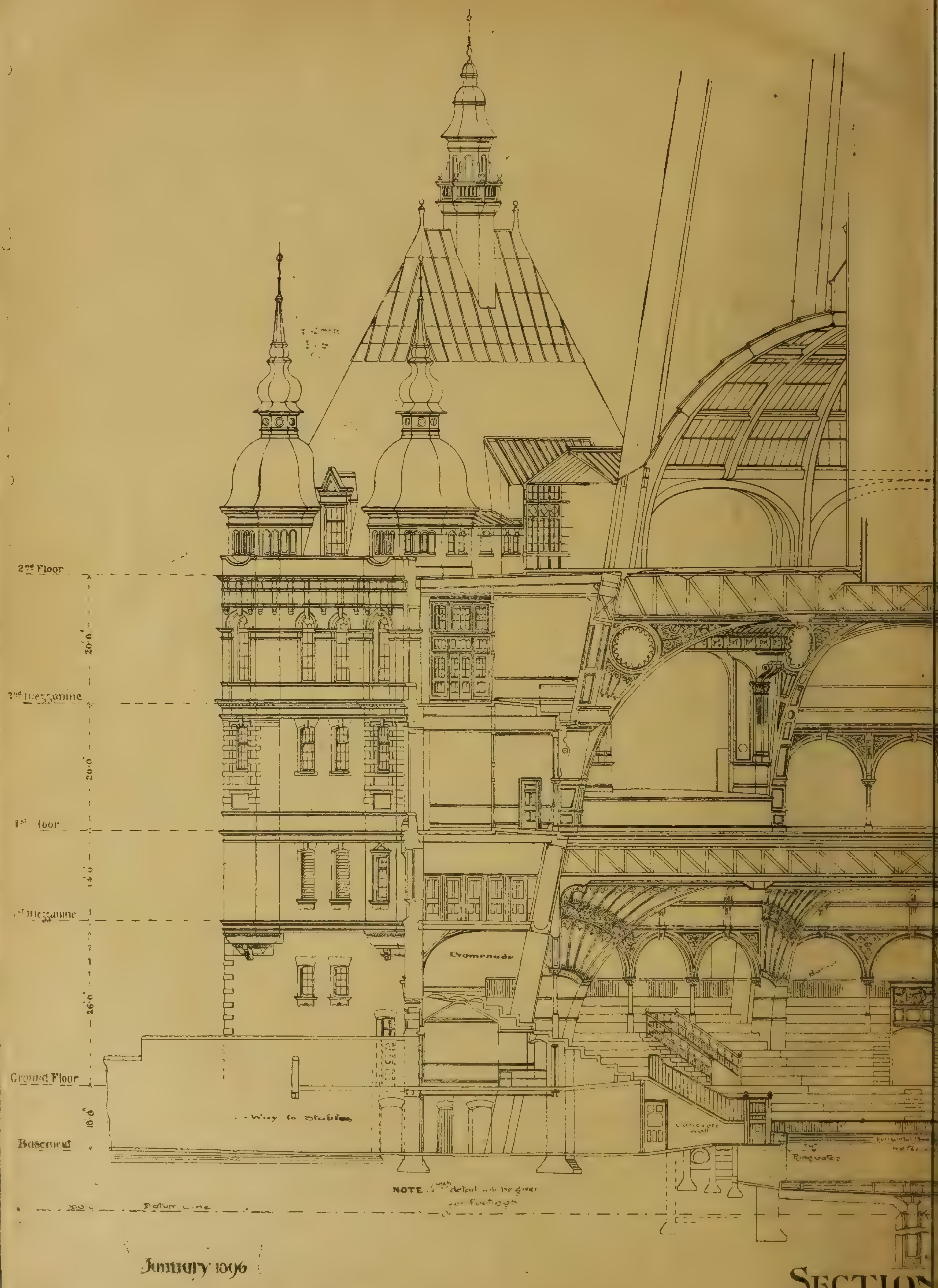
The fine tower of Clare Church, West Suffolk, has just been repaired at a cost of £1,160, from plans by, and under the superintendence of, Mr. Detmar J. Blow, of New-square, Lincoln's Inn. The greater portion of the tower was built in the 13th century, but another story was added in the 15th century, raising the height to 77ft. The inside rubble and flints have been removed bit by bit, and replaced by Portland cement and the same flints, while now and again bonds of the hardest Staffordshire blue bricks have been inserted, leaving the outside wall just as it was when originally constructed.

Further additional expenditure in connection with the second bore-hole of the Gainsborough artesian well will have to be incurred, and the urban council has passed a resolution to apply to the Local Government Board for sanction to a loan of £1,600, largely for the purpose of carrying out this work.

The picture by Nicolas Poussin, bequeathed by Mr. William Kenneday, of the Broxburn Oil Company, to Glasgow Corporation, has now been received and placed on view in the galleries. It is an important historical work, representing the legend of the sacrifice of Curtius for the salvation of Rome, and originally it belonged to Cardinal Richelieu.

Mr. A. G. Durnford, R.E., one of the Local Government Board inspectors, has held an inquiry at the Town Hall, Yeadon, relative to the application of the Yeadon Urban District Council for sanction to borrow £1,000 for the purpose of constructing a sewer from High-street, along Dam-lane, and across two fields, to the Dudley Hill and Killinghall main road, so as to drain 25 houses and farm buildings, which have hitherto been connected with cesspools.

NEW BRIGHT

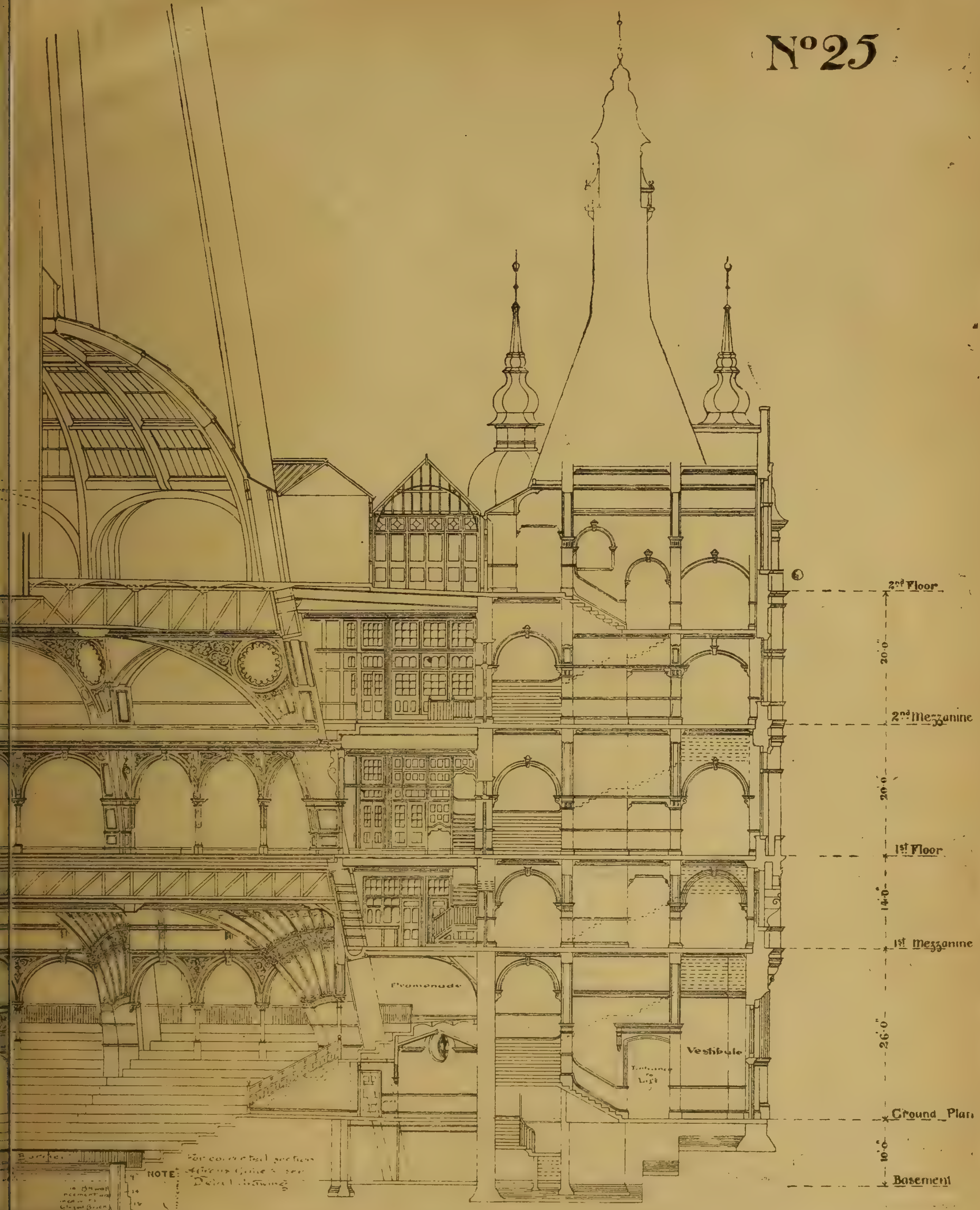


January 1896

SECTION

ON TOWER

No25



CD

Maxwell and Tuke ARCHITECTS
41 Corporation St
Manchester

OBITUARY.

We regret to announce the decease, after a short illness, of Mr. Richard Reynolds Rowe, F.S.A., F.R.I.B.A., aged 75 years. Mr. Rowe, who died at his residence, Park House, Cambridge, on Saturday last, had practised throughout a long professional career in that university town, and had carried out many important buildings. He became a Fellow of the Royal Institute of British Architects so far back as 1856, having been elected an Associate two years previously, and had read many papers before that body, and also at the meetings of the Royal Society of Antiquaries, of which he was also a member. He was a member of the Institute of Civil Engineers, which body he joined in 1855, and was also a Fellow of the Surveyors' Institution. Some time since he offered to build, at his own cost, a church in Cambridge.

We also have to record the death of Mr. Francis Thomas Dollman, F.R.I.B.A., at the advanced age of 87 years. Mr. Dollman died on Tuesday, at 63, Gloucester-terrace, Regent's Park, after a very short illness. He joined the Institute of Architects as an Associate in 1864, becoming a Fellow in 1895, in which year he retired from practice. Mr. Dollman was a candidate for the appointment of secretary to that body on the retirement of Mr. C. L. Eastlake in June, 1878, when the late Mr. William H. White was elected by the council. He was articled in the office of Augustus Pugin, father of Augustus Welby Pugin, contemporaneously with the late Benjamin Ferry, Talbot Bury, and Joseph Nash, all of whom long predeceased Mr. Dollman. On the completion of his articles, Mr. Dollman entered the office of George Bassevi, remaining with him from 1833 until Mr. Bassevi's accidental death by a fall at Ely Cathedral. He then commenced independent practice, his chief works being churches and rectories. He will be better remembered as an architectural writer than as an architect; he was associated with Mr. Jobbins in many well-illustrated and expensively-got-up archæological publications, including "Ancient Pulpits" and "Ancient Domestic Architecture," his last independent work being a monograph on the "History and Illustrations of the Grand Old Priory Church of St. Mary Overie, Southwark." We published a portrait of Mr. Dollman in our issue of Nov. 14, 1890.

◆

CHIPS.

The death is announced of a rising Parisian sculptor, M. Louis Clausade. He was employed on some decoration work in the Exhibition which compelled his attendance during the greater part of the day in one of the uncovered building yards along the Seine. Exposure to the severe cold in the open air brought on a sudden fit of congestion, to which the artist almost immediately succumbed. He was only 35 years of age, and had made a hit with a statue of Beaumarchais, which had been accepted for erection in Paris.

Major S. F. Marindin, of the Board of Trade, inspected on Thursday in last week, and afterwards expressed satisfaction with, the track at Aberdeen on which the electrically-equipped tramcars are to run between Kittybrewster and Woodside—a distance of a mile and a half. The section, which is two and three-quarter miles in length, was formally opened on Saturday. Mr. McAdam, of Aberdeen, carried out the permanent way, Messrs. M'Cartney and McIlroy the overhead construction, and the British Insulated Wire Corporation laid the cables. Mr. D. Jack is the borough surveyor, and Mr. Bell the electrical engineer. The cost of conversion has been £35,000.

The east window of the new church at Wortley, Leeds, was unveiled and dedicated on Friday. It has been filled with stained glass, and is a memorial of the late Mr. Henry Ingham, of Wortley. The subject is the Crucifixion; Christ on the cross, with Mary Magdalen kneeling at the foot, occupies the centre light. On the one side stands the Virgin, and on the other St. John, whilst the figures of the Centurion and Joseph of Arimathea occupy the outside lights. Over the side figures angels are in various attitudes of adoration.

The gas committee of the Manchester City Council have decided to give £5,000 as compensation to the widow of Mr. G. E. Stevenson, the manager of the Rochdale-road Gasworks, and consulting engineer to the committee, who was killed by the explosion at Rochdale-road a few weeks ago.

A portrait of the late Rev. Principal Brown, painted by Mr. Coutts Michie, has been presented to the Free Church College, Aberdeen, by Lady Stewart of Banchory, a daughter of the late Principal.

PROFESSIONAL AND TRADE SOCIETIES.

Glasgow and West of Scotland Technical College Architectural Craftsmen Society.—The usual meeting of the above society was held at the rooms, 204, George-street, on the 22nd inst., Mr. W. H. Baxter presiding over a large attendance. A paper was read by Mr. Isaac Low on "Water-Closets and their Connections." In his opening remarks he referred to the unsavoury nature of his subject, but showed how it was, more or less, a most important matter for consideration by architects and craftsmen. He deprecated the idea that any hole or corner is good enough for a water-closet; it should have, he said, three of its walls to the outside, although the cost was, of course, always prohibitive, to a great extent, to the proper sanitation of any building. He traced the evolution of the water-closet from the earliest times: it was in evidence considerably earlier than most would imagine, the farthest-back ideas being mostly in the form of a marble basin with the ordinary draw-valve. The idea was good, only the marble, being very absorbent, rendered such an article unsatisfactory. Thereafter he sketched the evolution of the pan-closet, which was similar in idea to that just mentioned, and expressed its features very well. Next he took up the hopper-closet, much used in Edinburgh, and which was really the prototype of the present "wash-down" closet—this latter being first brought out in Glasgow. He showed the various points in the S, P, and Q traps to this latest form, together with the nature of the best joints between the porcelain and the soil-pipe. Internal and exposed plumbers' work was also commented on, he being of the opinion that the former was quite proper if the tradesman did his work correctly. An interesting discussion followed, many points in actual practice being brought up, all of which Mr. Low explained very satisfactorily. The meeting closed with a vote of thanks to the essayist, which was heartily given.

Royal Institute of Architects of Ireland.—The annual general meeting of the Institute was held on Saturday evening, at 20, Lincoln-place, Dublin, Mr. Thomas Drew, R.H.A., president, occupied the chair. Mr. Albert E. Murray, A.R.H.A. (hon. secretary), read the annual report of council, in which sympathetic references were made to the death of two of the Senior Fellows—Mr. William Hague and Sir Thomas Newenham Deane. It stated that their muster roll now composed 25 Fellows, 63 members, and six probationers—a total of 93. Mr. J. Rawson Carroll moved the adoption of the report. Mr. W. Kaye Parry, C.E., seconded the motion, which was adopted unanimously. The auditor's report, showing a balance in hand amounting to £60 19s. 3d., was also adopted. The following were elected members of the committee of the Institute for the year 1900:—Messrs. G. C. Ashlin, R.H.A.; W. M. Mitchell, R.H.A.; Frederick Bathelor, J. Rawson Carroll, Charles Geoghegan, C. J. M'Carthy, R. Caulfield Orpin, J. H. Pentland, W. Kaye Parry, M.A.; hon. secretary, A. E. Murray; hon. treasurer, C. A. Owen. Messrs. S. W. Jervis, T. A. Coleman, J. L. Donnelly, J. T. Rea, T. E. Huaman, and T. E. Roberts were elected as members of the Institute, and the annual dinner of the Institute was held in the Central Hotel, at seven o'clock, after the conclusion of the meeting. Mr. Thomas Drew, R.H.A., president, occupied the chair. The company consisted of about 70 gentlemen. A pleasing feature of the dinner was the presentation of a good hunter repeating watch to Mr. A. E. Murray by his colleagues past and present on the council of the institute on the occasion of his vacating the treasurership, as a small token of their appreciation of his great services in that capacity during the past 13 years.

◆

A stained-glass window was dedicated at the morning service last week in the parish church of Minchin Hampton, Gloucestershire. The subject is the Adoration of the Magi, and the artist is Mr. H. W. Bryans, 38, Chester-terrace, Regent's Park.

In Paisley Dean of Guild Court plans of a new refuse destructor of the Horsfall type, to be erected on a site at Underwood, comprising 6½ acres, has been passed. The buildings will be of brick 70ft. by 120ft. The destructor proper consists of eight separate furnaces, which will burn about 80 tons of refuse per day of 24 hours. The cost will be about £1,300.

Building Intelligence.

Kingston-on-Thames.—A new Roman Catholic church dedicated to St. Agatha, and built at the sole cost of Mrs. Currie, was opened on Thursday in last week. It is 4th-century Roman in style, and faces Wyndham-road. The sanctuary terminates in a semicircular apse. Two arches, the full width of the nave, springing from foliated capitals, divide the sanctuary from the nave. There are east and west aisles, and opening from arches in the wall of the east side are two chapels. From these an archway leads to the baptistery, which is semicircular, with semi-domed roof. The nave, sanctuary, and chapels have stone columns, with carved capitals and mounted bases. The roof is segmented, the apse being a semi-dome, panelled in five divisions. Twelve semi-circular windows in the clerestory give light by day, and the electric light has been installed for artificial illumination. The walls are plastered, but in due time the apse will be adorned with mosaics. The floor is laid with wood blocks on a bed of concrete, and the building is heated with hot air. The organ is placed in a west gallery over the inner porch. The walls are of red brick with stone facings, the roof of green Welsh slating, and the porch has a niche above it for the statue of St. Agatha. The accommodation is for about 300 worshippers, and the cost has been £6,000. Mr. J. Kelly was the architect, and the builders were Messrs. Goddard.

Trofarth.—St. John's Church, Trofarth, a plain little church built on a side of a hill 900ft. above the sea, was reopened on the 19th inst., after enlargement and alteration. It was built from plans by the late Sir Gilbert Scott, and was opened in June, 1873, and it has now been restored and added to from plans by Messrs. Douglas and Minshull, of Chester. The edifice has been enlarged by the addition of an organ chamber, vestry, and heating cell. The interior has been remodelled, the plaster having been removed, and the walls refaced with mosaic work of cleft Llysfaen limestone, while Cefn stone dressings have been inserted in the windows and door. The floors have been repaired, the aisle being laid with red tiles in herring-bone pattern, and the chancel and sanatorium with encaustic tiles. A portion of the nave has been absorbed by the chancel, which is entered by an oak screen. All the fittings, seats, and prayer-desks are new, executed in oak design. The builders were Messrs. S. Parry and Son, Llandudno Junction.

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The death has taken place in Ipswich of an aged resident in Mr. John Gooding, who for a long period held the position of foreman to the firm of Messrs. Gibbons, builders. The deceased, who had attained his 85th year, went to Ipswich more than 60 years ago from Debenham. Mr. Gooding acted as foreman in the erection of several public buildings in Ipswich, amongst which may be noted the Customs House, the Borough Asylum, the Town and Public halls, besides Crown-street and London-road Chapels. The deceased, who was a powerfully-built man, stood 6ft. 3in. in height, and when in the prime of life scaled 20 stone.

The death occurred last week of Mr. W. H. Lutey, surveyor to the West Penrith Rural District Council, West Cornwall.

The Stourbridge Urban District Council decided some time ago to vote £4,000 towards the cost of the new art and technical schools which the Stourbridge and District Technical Board have decided to erect in Worcester-street to meet the growing work carried on in the classes. The sanction of the Local Government Board was needed to make the vote effective, and Mr. R. H. Bicknell, C.E., inspector to the Board, has held an inquiry on the subject at the Council Chamber, Stourbridge. Mr. J. M. Gething, the architect, laid the plans before the inspector, and it was stated that they had already had the approval of the County Council and of the Science and Art Department.

At the conclusion of the past term of the Crystal Palace Engineering School, the certificates gained by the students were distributed by Mr. William Tregarthen Douglass, M.Inst.C.E., late consulting engineer to the Trinity House. The report of the examiners, who were Messrs. J. Patten Barber, M.Inst.C.E., F. D. Workman, Assoc.M.Inst.C.E., and Ch. Capito, M.Inst.E.E., were read, and an address was delivered by Mr. Douglass, who referred to the value of the work which was being carried out in the different sections of the school. The principal of the school, Mr. J. W. Wilson, A.M.Inst.C.E., also gave a short address.

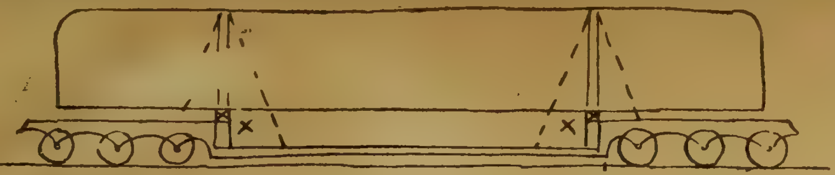

Fig. 1.

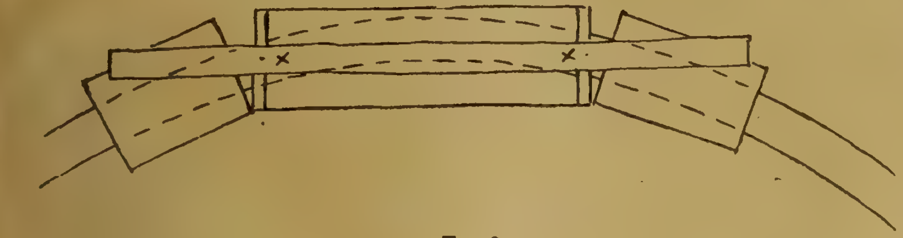

Fig. 2.

HOW TO CARRY A LONG GIRDER.

THOUSANDS of tons of long girders to be used for bridges and for buildings are carried on our railways and roads every year. A very slight error or want of foresight in the handling of these girders during their carriage may severely damage them, and, in fact, it is quite possible to strain (the word being used in its proper sense of deformation) the flanges or web with rough or unskilled handling more seriously than the girders would be strained under their intended load. A girder laid on its side, when it is never intended or designed to be placed in such a position, may have its effective strength very easily deteriorated, and it is even possible that in some cases a permanent strain due to stress beyond the limit of elasticity may be forced into the girder whilst under handling, lifting, or transit.

The writer has seen long deep girders of very narrow flange, the very narrowness of the flange probably intended to be met in fixing the work by some cross-bracing or ties, very severely treated by temporarily resting the girders on supports at each end, their own weight alone whilst in this position deflecting the girder several inches, and then, added to this deflection due to their own weight, several men with loads may have walked along the web of the girder from end to end, every step swaying and bending the girder several more inches up and down. This kind of sideways stress was of course never anticipated by the designer of the ironwork, and should never have been allowed to occur.

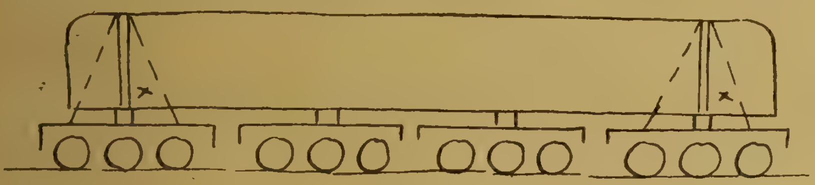

Fig. 4.

Then there is the danger of careless handling and lifting when loading and unloading the girders on and off the vehicles carrying them, whether these be railway waggons or road trucks, from the makers' yard to the site of erection. The writer has known many instances of girderwork being much injured by this treatment, and in several cases, parts of work that should have travelled safely have had to be partially cut to pieces, certain parts heated and made good and straight, and then re-riveted into its position.

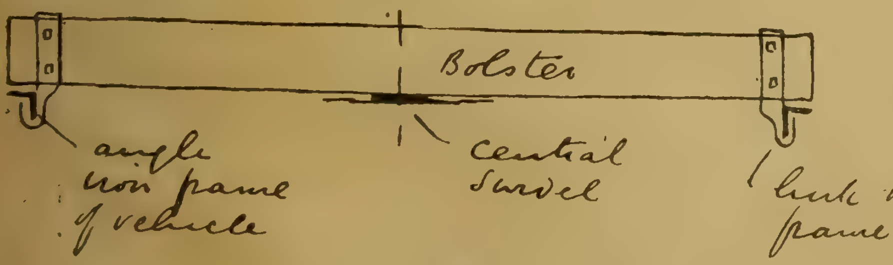

Fig. 6.

As a matter of fact, the loading and unloading of long heavy and (under certain conditions) unstable girders, is generally left to a foreman who possesses no knowledge of stresses or strains, and who probably does not know the difference between tension and compression, or shearing or torsion. Such a man may easily injure the girderwork with the powerful cranes or lifting appliances, which are under his control. It is something analogous to a battery of artillery being placed in the charge of a corporal who has never been through a military school. He may do a great deal of harm in a very short time.

The writer once had a terrific struggle with one of this class, a "loading" foreman employed by one of the large railway companies. The foreman or "inspector" insisted that certain girders that had to travel several hundred miles should be loaded on their sides, whilst the writer equally insisted on the girders travelling in a vertical position, or in the position in which they had been designed to carry their own weight. In the end the foreman was defeated, but not before the writer had undertaken to take sole responsibility during transit.

METHODS OF CARRIAGE.

There are two methods of carriage of girders over railways. One is with fixed bearings such as the case when the girder is loaded on to a boiler-truck in which the frame and supports are rigid. (Fig. 1.)

In this case, the question must be considered whether the girder is of requisite strength to act as a cantilever between the bearing and the end of the girder.

The next question to be thought out is whether the height of the girder when loaded on the truck is sufficiently low for it to travel under the loading gauge of the different railway lines on which it may have to travel. In this connection the sharpest curve on the route must be known, because in the case of a sharp curve the loading-gauge follows the curve, whilst the girder is straight, and does not curve with the track. Plan Fig. 2 will show this.

It will be seen that the centre of the girder is to one side of the centre line of the rails, and the ends of the girder are to the other side of the centre line of the rails. This makes the virtual width of the load much more when travelling over curves.

The cant of the rails where curves occur is also worthy of consideration. In some cases of 4in. or 6in. cant or superelevation, the leaning over of the girder towards the low rail must be provided against by stiff struts of timber on the one side and efficient chains on the other side, and as the vehicle will have to go over curves both right hand and left, the struts and chains must be provided on both sides equally. A further consideration is the endways bumping of the vehicle when the train is suddenly stopped and started on the journey. This will occur at all stations or signals at which the train will stop, and may occur when the engine-driver is descending a gradient and shuts off steam and applies his brake, or when the guard in his own van applies his brake. This endways bumping is to be met by chains fixed at an inclination to the vertical, and at both sides of the top of each strut. Fig. 3 shows the load when travelling over a curve with superelevated outer rail.

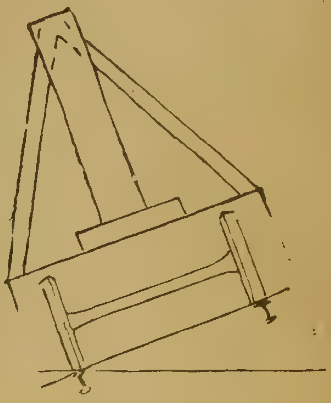

Fig. 3.

The second method of carrying over railways is with movable bearings or bolster waggons. It is not often that timber bolster waggons can be used for carrying girders as they are not sufficiently strong for very heavy loads; but sometimes special rail trolleys that are not in use at the time for transporting the long rails of our railway companies are used for the purpose of carrying very heavy girders (see Fig. 4). In this case the same considerations of loading gauge, cant on rails, and end shocks will have to be made; but the case becomes much more complicated.

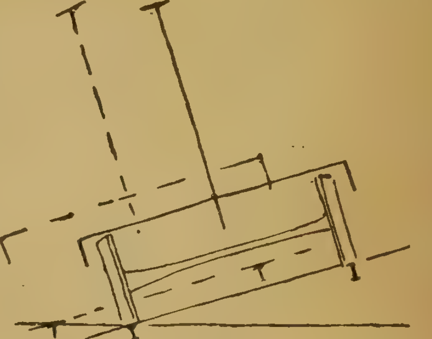

Fig. 5.

It is well known that when felled trees are carried on bolster waggons, and firmly chained down to three or four of the waggons—the load being too long to be carried on only two bolster waggons—that, in such cases, the travelling of the combination will in such cases either break the timber log, or, what is more probable, force the leading or trailing wheels off the road when passing over curves, and so derail the vehicles, or some of them. In this case the load is rigid, and the vehicle is movable with disastrous results.

If a load of timber logs should not be treated in this manner, much less should our girders be so dealt with. The result must be that either the stiff girder will force the vehicle off the road, or the vehicle when going around curves will damage the girder. But there is another reason why our girder must only be attached in two places to the vehicle, and why it should be well clear even to the extent of several inches from all other fastenings than the two referred to.

A railway track is a thing both of curves and also of gradients. Whenever a change of gradient occurs, and the changes of inclination are many, either a salient or a re-entrant angle (in a vertical sense) has to be passed over. At a salient angle, or angle greater than 180°, if the girder were resting on four points, the load would be resting on the two inner points only, with a tendency to lift the two end vehicles off the road, and, on the other hand, at a re-entrant angle or angle less than 180°, the two end vehicles would be supporting the load, and the girder would be actually lifting the two inside vehicles off the road, and, of course, in this case the weight of the vehicles lifted off the rails would be added to the weight of the girders or the load-carrying trucks, which would be overloaded and disaster ensue.

Further, there is the consideration of the three or four-truck vehicle when travelling over a curve with superelevated rail. Take a case of a rigid girder, when travelling on a four-truck vehicle, when passing over such a curve. It is assumed that the girder is supported and fastened at the two centre bolsters only, but that it is simply resting on the two end bolsters.

Fig. 5 will show the position, the full lines showing the inner vehicles, and the dotted lines the end vehicle. The centre lines are shown of both sets of vehicles, and as the centre line of the girder is rigidly straight, it will seen at once that the end vehicles will lift the ends of the girder, together with the inner vehicles, every time a curve with canted rails is passed over.

Further, there is yet the consideration that the connection of the bolster to the waggon is only at its centre or point of swivel, and at no other place. If the wind is taken into account together with a large cant in the rails, a considerable overturning tendency has to be dealt with. For this the sole connection at the swivel is not quite satisfactory, and some holding-down link at the ends of the bolsters should be made, at least in the case of very deep girders. The case of the usual load of rails on these trolleys need not be considered, as the rails are neither so rigid nor stacked so high as the girder on edge.

Fig. 6 gives an idea of such an attachment; of course the links or attachment should be made so that the bolster has full liberty to move sideways upon its bearings. Great care should be taken to oil or grease all parts that require it before the journey is made.

* * *

Building operations in York during the year just ending have been concentrated in Heworth-road, Huntington-road, Burton-lane, Leeman-road, Bishopsthorpe-road, and Acomb-road. 367 plans have been submitted during the year, of which 278 have been passed, comprising 954 houses, 102 warehouses, outbuildings, &c., 124 alterations to premises, 41 new streets, and 11 public buildings.

The chancel of St. James's Church, Pipe Ridware, Staffs, was reopened last week by the Bishop of Lichfield. The work has been carried out under the direction of Mr. J. Oldrid Scott, F.S.A. A triple chancel arch rests on Irish limestone shafts. There are also shafts of the same material in each window, in which have been placed three lights. Mr. Ward, of Uttoxeter, has carried out the building work, and Mr. Culwich, of Lichfield, was responsible for the ironwork.

Mr. J. D. Watson, who has recently been appointed engineer to the Birmingham Tame and Rea District Drainage Board, entered upon his duties on Friday. At the last meeting of the Aberdeen County Council, to which Mr. Watson had been county engineer, a resolution was passed relieving him from his duties practically immediately. At the same time, in view of the large amount of extra work which Mr. Watson had performed, the council unanimously resolved to present him with an honorarium of £250.

The Barton Union New Workhouse Infirmary, Patricroft, near Manchester, is being warmed and ventilated throughout by means of Shorland's patent double-fronted Manchester stoves with descending smoke flues and Shorland's patent exhaust roof ventilators, the same being supplied by Messrs. E. H. Shorland and Brother, of Manchester.

Engineering Notes.

Railway Extension in the West Highlands.—A *Times* correspondent points out that of the new railways authorised and in course of construction in the United Kingdom at the present time, something like one-third are to be found in the counties of Argyll and Inverness, within a radius of 30 miles or so from Ben Nevis. In this area there are no less than four new lines, with an aggregate length of over 100 miles, and two of them—measuring altogether over 60 miles—are now well on to completion. The longest is the Mallaig extension of the West Highland Railway, which runs from Banavie through Arisaig to Mallaig, on the Sound of Sleat, a distance of just under 40 miles. It is expected to be open for traffic next year. For the first 30 miles of its course from Banavie it runs almost due west, for the most part following closely the main road to Arisaig, though the two take opposite sides of Loch Eil. Crossing the Caledonian Canal by a swing bridge, it reaches its first station at Corpach, where the canal leaves Loch Linnhe, and then proceeds along the northern shore of Loch Eil, from which it is protected by a long series of sea-walls. So long as it is skirting the loch its levels are naturally good, but it has not long left Kinlocheil on its way to Glenfinnan at the head of Loch Shiel before heavy engineering works begin to make themselves felt in the shape of deep cuttings, a short tunnel, and severe gradients reaching as high as 1 in 50. At Glenfinnan itself there is a concrete viaduct of 21 spans, built on a sharp curve, which is 100ft. high and nearly a quarter of a mile long. Some four miles further on a summit is reached, and thence the line falls sharply down to Loch Eil, of which it follows the south shore. At the end of the loch it crosses the river Ailort, and runs along its right bank to Kinlochailort Station, which is succeeded by a series of short tunnels, deep cuttings, and high embankments. Passing Loch Ailort and Loch-nan-Uamh, with viaducts of six and eight spans respectively at Arnabol and Loch-nan-Uamh, it reaches Beasdale Station through four tunnels (the first on a gradient of 1 in 48) and a long cutting over 40ft. deep. The longest tunnel on the line—350 yards—occurs next at Borrodale, and the viaduct over the burn there contains a span of 127ft. 6in., one of the biggest yet attempted in concrete. Continuing its course over steep slopes and deep cuttings to Arisaig, the railway bends in a northerly direction, and, running its last eight miles through Morar at some distance from the coast, crosses the narrow neck of land that separates the sea from Loch Morar, and finally reaches its destination at Mallaig. The next longest line of the four runs from Connel Ferry, near Oban, to the slate quarries at Ballachulish, through Appin. The line, which was authorised in 1896, is 25½ miles long, and is being built by the Callander and Oban Company, from whose railway it starts by a double junction at Connel Ferry. The most interesting piece of engineering work on the line is the bridge at Connel Ferry, crossing Loch Etive, at the famous "Falls of Lora." Here the channel is not only very narrow, but is also obstructed for two-thirds of its width by a reef of rocks over which at the ebb of a spring-tide the water from the loch pours in a noisy sea-cataract several feet high. This bridge is designed with a span of 500ft. In 1896 the West Highland Company obtained powers to make a line to North Ballachulish, on the opposite side of Loch Leven, along the shores of Loch Linnhe, from its existing railway at Fort William. The length of this branch is just over twelve miles. The fourth line was authorised in 1896, to run from Spean Bridge on the West Highland to Fort Augustus on the Caledonian Canal. On leaving the West Highland system the line crosses the river Spean on a high viaduct, and then runs down its right bank for about two miles to Gairlochy; there it turns to the north-west, and begins a climb up the hillside for some six miles; then, after descending through Laggan, the line keeps to the east side of Loch Oich, passes through the only tunnel that it has been found necessary to make, and reaches Fort Augustus along a valley which runs parallel to that of the river Oich. At Fort Augustus it is carried over the canal on a swing bridge with a clear span of 54ft., and, crossing the Oich on a four-span viaduct, it comes to an end at a pier on Loch Ness. The total length of this line, which is nearly finished, is 24½ miles. A light railway, 18¾ miles long, in connection with the West Highland, was authorised in 1898 between Arrochar, at the head of Loch Long, and St. Catherine's, on Loch Fyne, opposite Inverary, making a length of the new lines for the construction of which powers have been granted in the West Highlands amounting in all to 122 miles.

St. Helens, Lancs.—The official inspection of the St. Helens new railway, prior to its opening for passenger traffic early in January, was made last week by Colonel Von Donop, on behalf of the Board of Trade. The project to construct a new line from Manchester to Liverpool, by way of St. Helens, was started about a dozen years ago; but the section from St. Helens to Liverpool was ultimately abandoned. A single line of rails from St. Helens to Ashton-in-Makerfield, and thence to Lowton Junction, has been in use for goods traffic for about three years, and the double set of rails to be used for passenger traffic has now been constructed. The inspection of Tuesday was confined to the section between St. Helens and Ashton-in-Makerfield. Accompanying the inspector were Messrs. C. A. Rowlandson (chief engineer to the Great Central Company), C. W. Neill (electrical engineer), H. Blundell (district engineer), S. W. Pilling (contractor for the new railway), and Hallett (resident engineer). A favourable report is expected.

The Montevideo Port Scheme.—The Chambers of Uruguay have sanctioned the two Bills relative to the construction of the new port of Montevideo, and the executive has promulgated the same as law. The first Bill approves the definite plans for the port works of Montevideo prepared by the French engineer M. Guéard on the bases of the alternative scheme drawn up by him and the German engineer Herr Kümmer some three years ago. The executive is authorised to contract at once for the execution of the principal parts of this scheme (which is so devised that the port may be constructed in sections) and to employ in the same £2,650,000 sterling from the resources voted for that purpose. The minimum depth to which the entrance channel, port, and ante-port are to be dredged is 7½ mètres (which will allow the access of much larger vessels that can at present enter the Bay of Montevideo). The second Bill deals with the financial resources and administrative machinery. The building of the port is expected to occupy some eight years.

* * *

STATUES, MEMORIALS, &c.

New York.—The Soldiers' and Sailors' Monument Commission have again changed the site of the proposed monument. The site this time is changed from Mount Tom, at Eighty-third-street and Riverside Drive, to a place in the Drive between Eighty-ninth and Ninetieth Streets. The objections to the Mount Tom site were that two apartment-houses have been erected there recently, which would spoil the appearance of the monument. The new site was referred to the Municipal Art Commission for approval. The Municipal Assembly has authorised the spending of £50,000 sterling on the monument.

Philadelphia.—A monument is in process of erection in Fairmount Park, in Philadelphia, to the memory of the late Richard Smith, which is to cost half a million dollars, and will otherwise form one of the most interesting structures in the city. The idea of the architect, Mr. Windrim, is to divide the design into two portions, each consisting of a sort of colonnade, forming in plan an arc of ninety degrees, and terminating in a pedestal, on which stands a single gigantic column, supporting a colossal statue. The two statues, with the columns on which they stand, are separated far enough from each other to allow the main driveway of the Park to pass between them, the curved screens diverging on each side, so as partly to inclose one of those circular deserts, or "concourses," formerly beloved of park commissioners. Places are provided on the structure for a large number of statues, and Messrs. Daniel C. French, William Ordway Partridge, Paul W. Bartlett, and J. Q. A. Ward have been already commissioned to execute the most important ones, while niches will be filled by works from the hands of Messrs. Bissell, Grafly, Calder, Ezekiel, and Murray, and Misses Bessie C. Potter and Katherine M. Cohen.

* * *

At the monthly meeting of the Glasgow Archæological Society, held on the 21st inst. in the hall of the society, 207, Bath-street, Glasgow, Mr. J. Dalrymple Duncan, F.S.A., F.R.S.E., read a paper on "The Château of St. Fargeau."

SPECIAL OFFER.—CHEAP VOLUMES.

In the course of the next few months we are compelled, owing to the making of the new street from Holborn to the Strand by the London County Council, to remove our Offices and Printing Works. Due notice of our removal will be given shortly. In the mean time, to reduce stock and save trouble of removal, we offer readers desirous of making up sets of back volumes *any volume* in the list below at HALF PRICE, or post free for Six Shillings each.

Volumes are all in good condition. The offer at this price will only be available till our removal.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. All communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondents.]

It is particularly requested that all drawings and all communications respecting illustrations or literary matter should be addressed to the EDITOR of the BUILDING NEWS, 332, Strand, W.C., and not to members of the staff by name. Delay is not unfrequently otherwise caused. All drawings and other communications are sent at contributors' risks, and the Editor will not undertake to pay for, or be liable for, unsought contributions.

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"BUILDING NEWS" DESIGNING CLUB.

DRAWINGS RECEIVED.—"Don," "Apex," "A Beetle," "F. D.," "Ulmus," "Jack."

Correspondence.

NO ROOM FOR R I.B.A. IN GARDEN CITY.

To the Editor of the BUILDING NEWS.

SIR,—I believe Mr. Howard and Mr. Steere will find that, apart from the "social and educational opportunities which no small town can afford," as Mr. Howard says in p. 857, the mere economic difference between founding 80 new cities on 480,000 acres, or one new city on 12,000 acres—I put it at twice his allowance of land—will eventually drive away a majority of the many favourers of the scheme, if they stick to their limitations.

But at the end of the letter he accuses me of saying "splendid cities can be built without architects." I said nothing about architects, but about R.I.B.A., the creatures of Soane's Institute. In fact I am against building without paid architects. Remember, it is 185 years since our nation dismissed her last paid architect, Sir Christopher Wren. Since his supersession by some Germans, you depend on creatures taking "percentage-on-outlay," which is no pay at all, but illegal bribery. So Lord Kenyon pronounced it a century ago, and a plaintiff who had made no other charge than this percentage-on-outlay, was non-suited, and all his labour went gratis!

Now as we are legally to buy the land, we mean to stick to the law. Architects of ours will have to charge legally, and the first that we can catch Soanising, or playing R.I.B.A. to the smallest extent, even one farthing of "percentage-on-outlay," we have not to punish, but to protect others against him. There is plenty of church-work for R.I.B.A., only we claim to exclude them from our new city.—I am, &c.,

E. L. GARBETT.

Intercommunication.

QUESTIONS.

[11393.]—**Safe Load on Granite Pillar.**—Could any of your readers inform me how the safe load on a granite pillar circular and square is calculated? By Molesworth, the crushing strain of grey granite per square inch is 10,900lb. What would be a safe load for a pillar 12ft. by 1ft. 6in. by 9in. in one stone, or if built in courses 1ft. high? We would like to know the safe load and how it is wrought out or calculated.—BONACCORD.

[11394.]—**Flushing Tanks for Drains.**—Will a reader kindly inform me of the best kind of flushing tank to flush a number of nine closets, and how high above latrines should it be fixed? Are not automatic tanks the best?—COUNTRY BUILDER.

[11395.]—**Cost of Lead Joints.**—Will any of your practical plumbing readers say what a 4in. wiped joint is worth? Prices vary very much for this class of work.—A. T.

[11396.]—**Slag Wool as a Protection against Cold.**—Is not slag wool a good substance to line the ceiling and walls of a room which is very much exposed? What thickness of lining should be fixed against walls and ceiling, and how should the wool be secured to walls and ceiling, and how can it be finished inside?—A CONSTANT READER.

[11397.]—**Drainage.**—Could any of your readers kindly afford information as to the following? A is called upon by the sanitary authorities to relay the drain of his house, which he discovers receives the sewage from three other houses, and acquaints the sanitary inspector of the fact. The inspector tells A that if the authorities relay the drain they would claim the ground under which it ran; but if A had the work done, he would be entitled to demand a portion of the cost from the owners of the other houses. A acted upon that statement. What are his legal rights? How should A have acted when he discovered that the drain served for the other houses also?—A. C.

CHIPS.

Colonel A. G. Durnford, one of the Local Government Board's inspectors, held an inquiry at Sandal, near Wakefield, on the 21st inst., with reference to an application by the Sandal Urban District Council for permission to borrow £1,700 for private street improvements.

Mr. A. E. Pridmore, M.S.A., F.S.I., of Broad-street Buildings, has been re-elected at the head of the poll out of 17 candidates as one of the representatives of Bishopsgate Ward on the City Corporation.

Christ Church, Brook Green, West Kensington Park, will be offered for sale by auction in a week or two. The lots comprise, beside the fabric, a vestry, choir, pulpit, reading-desk, chandeliers, a two-manual organ, and a gas-heating stove.

Mr. Andrew Carnegie has offered Dunfermline £20,000 for baths and a gymnasium as a Christmas gift.

On Saturday a three-light stained-glass window was unveiled in St. Mary's Chapel, Aberdeen, to the memory of the Rev. Robert A. Mitchell, M.A., minister of the church from 1877 to 1897. The window, designed by Mr. David Gauld, and made by Messrs. Guthrie and Wells, Glasgow and London, has representations of St. John, St. Paul, and St. Peter.

At Dewsbury Town-hall on Friday, Mr. Burd, an inspector of the Local Government Board, held an inquiry *re* an application by the corporation for an a provisional order to enable them to borrow money for a covered market and for other purposes.

LEGAL INTELLIGENCE.

THE VALUE OF PROPERTY IN THE STRAND.—Mr. Troutbeck and a special jury concluded on the 21st inst. the hearing of the case of "Fowler's Trustees v. the London County Council" (reported in our last issue, p. 858), a claim for compensation in respect of the freehold interest in the Opera Comique Theatre, Strand, which is about to be demolished for the widening of the thoroughfare between St. Clement Danes and St. Mary-le-Strand. Mr. Freeman, Q.C., and Mr. Ernest Pollock appeared for the claimants; Sir Edward Clarke, Q.C., Mr. Edward Boyle, Q.C., and Mr. Walter Ryde represented the London County Council. The claim was for about £60,000, and the case for the claimants was closed. Sir Edward Clarke, in opening the case for the County Council, contended that the house had not been a remunerative property, and had not been open at all for the greater portion of the year. He stated also that the tide of fashionable theatre-goers was now setting to the newer houses in the heart of the West-end. Among the experts he would call were Mr. James Green (Weatherall and Green), Mr. Ernest Runtz, Mr. Herbert Furber (Furber and Furber), Major Isaacs, and others. At this point there was a consultation, and the case was settled for £40,000.

A BUILDING BY-LAW APPEAL FROM WEST HAM.—WELSH V. MAYOR, &C., OF WEST HAM.—In the Queen's Bench Division, last week, Mr. Justice Darling and Mr. Justice Channell heard an appeal by case stated from a conviction by the deputy stipendiary magistrate of West Ham. An information was laid by the respondents against the appellants for that, having been convicted on Nov. 30, 1898, of an offence committed on Sept. 3, 1898, against one of the by-laws of the borough relating to buildings, they did continue such offence for 85 days after written notice, contrary to section 158 of the Public Health Act, 1875. The by-law was one providing for a sufficiency of air space about buildings to secure a free circulation of air. The appellants were builders, and in 1898 they rebuilt for the Commercial Brewery Co. the Dewdrop Inn, Arkwright-street, in the borough of West Ham. The conviction on Nov. 30, 1898, was admitted; but it was stated that after that date the appellants had not been in possession of the premises, and had no right, power, or authority to go upon them. The premises remained in the same condition as on Sept. 3, 1898, and as on the date of the conviction. The notice given by the respondents, who were the urban authority, was served on the appellants on Jan. 20, 1899. The magistrate held that the existing of the building in the condition above stated was a continuing offence, and convicted the appellants. Section 158 of the Public Health Act, 1875, after providing that an urban authority may, after notice, pull down any building not erected in accordance with their by-laws, enacts that: "Where an urban authority may under this section pull down or remove any work begun or executed in contravention of any by-law, or where the beginning or execution of the work is an offence in respect whereof the offender is liable in respect of any by-law to a penalty, the existence of the work during its continuance in such a form and state as to be in contravention of the by-law shall be deemed to be a continuing offence, but a penalty shall not be incurred in respect thereof after the expiration of one year from the day when the offence was committed or the by-law was broken." The appellants' contention was that they could not be convicted of a continuing offence inasmuch as they were not owners of the premises and could not comply with the respondents' notice without committing a trespass. "Marshall v. Smith," "Rumball v. Schmidt," "Reay v. Mayor, &c., of Gateshead," and "Smith v. Legg" were cited. The Court allowed the appeal. Mr. Justice Darling said that if the building was put up in contravention of the Act the local authority might have ordered it to be pulled down. The statute went on to say that if the building remained in that condition there was a continuing offence. The question was, Who committed the continuing offence? The builders, the appellants in this case, had done wrong in the first instance, and had been convicted for it; but before the notice in respect of which these proceedings were taken was served they had gone away and had nothing more to do with the building. The local authority had it in their own hands to put an end to the offence either by pulling the building down or by proceeding against the person or persons who really continued the offence. The statute did not say that the person who first committed the offence was responsible for its continuance. Such a person was responsible for his own misfeasance; but it did not follow that another person might not be responsible for continuing the offence. That person need not be the original builder. Mr. Justice Channell said that he was of the same opinion. The latter part of Section 158 was introduced to meet the case of "Marshall v. Smith," in which it was held that suffering a wall built in contravention of a by-law to remain unaltered was not a "continuing offence." As the offence was building the wall, not pulling it down was not a continuance of the offence. The question was, Who is the person guilty of the continuing offence in this case? The Act might have said that the original builder was the person guilty. The Court were asked to assume that the Act meant this because the section limited the penalties to one year. His Lordship, however, thought that the reasonable meaning of the section was that the person who was liable for the continuing offence was the person who actually continued it. If the local authority could not find out who that person was, so much the worse for them. The Act, at all events, provided (in section 306), machinery for discovering the owner. There was nothing in the Act which obliged their Lordships to hold that there was here a continuing offence by the person or persons who originally erected the building. In "Reay v. Mayor, &c., of Gateshead," Mr. Justice Hawkins was reported to have used language which justified the decision of the learned magistrate. The words attributed to him were, "If this section had been passed before 'Marshall v. Smith' there would have been no doubt at all that the penalties there would have been properly imposed." But having regard to the actual decision in "Marshall v. Smith," this language was inaccurate and might have been incorrectly reported.

Action for Conversion.—At the Liverpool Assizes on Dec. 13, before Mr. Justice Phillimore, an action was brought by the Accrington Brick and Tile Company, Limited, and others, against Samuel Furness Thomas and Wm. Alexander Thorburn, to recover compensation for the alleged wrongful conversion by the defendants of certain building materials upon land belonging to the defendants at Fazakerley. The defendants denied all the material allegations in the statement of claim, pleaded that the plaintiffs were not entitled to have the goods, and alleged that they were entitled to a lien upon them. Mr. Taylor, Q.C., with Mr. Segar, appeared for the plaintiffs, and Mr. Pickford, Q.C., and Mr. M'Conkey for the defendants. The opening statement of Mr. Taylor was to the effect that the plaintiffs, who were six in number, were creditors of some bankrupts named Thomas and Hughes, a firm of builders, and the plaintiffs bought from the official receiver in that bankruptcy the claim against the present defendants for having converted certain loose building material upon land at Park-avenue, Fazakerley. In the beginning of the year Thomas and Hughes were tenants at will of the defendants in regard to a plot of building land in Park-avenue, for which they were to pay £100 per annum. The agreement gave powers to the defendants to enter upon possession of the land under certain eventualities; but it contained no clause that the material brought on to the land should become the property of the landowner. On the failure of the builders, the official receiver in Liverpool, who was appointed trustee, sold the assets to the plaintiffs. The latter now contended that the defendants now refused to give up the materials, except on payment of a year's rent, amounting to £100, and asserted that defendants had converted to their own use a certain part of the goods. The amount of the plaintiffs' claim was £693. For the defence, it was alleged that when Thomas and Hughes became bankrupt the defendants had a lien on the goods, and that if any portion was sold, it was with the bankrupts' consent. They paid £40 into court. His lordship thought the plaintiffs could not claim more than £368, the sworn value of the materials, and gave judgment upon that basis. In his opinion the defendants had converted the property, and he did not accept the idea, which he thought was an afterthought, that defendants were acting as agents of Thomas and Hughes, although they might have acted in what they thought the best interests of those gentlemen. They were claiming to act under their supposed powers under the contract. He decided the action on the ground that there was a conversion and gave judgment for the plaintiffs for £368 and costs.

An Architect's Fees.—At the Watford County-court, on Dec. 11, before his Honour Sir Alfred Marten, Q.C., judge, and a jury, William Henry Swannell, an architect, of Rickmansworth, brought an action against Mr. William Wright, also of Rickmansworth, for £38 10s., in respect of the preparation of plans and specifications for the building of three houses at Rickmansworth. Mr. Raffety, barrister, represented plaintiff, whose case was that the work was done by him, and he ought to be paid. Mr. Cohen, however, for the defendant, stated that plaintiff was not a qualified architect, and that the work had to be done over again by another architect. Plaintiff admitted that £10 had been offered him, but he took it as an insult, not being sufficient. He was not a member of the Royal Institute of British Architects, and had not based his charges on their scale, but upon the customs of the trade. Plaintiff called his draughtsman, who stated that the plans were prepared by him, under the supervision of Mr. Swannell. When the plans had been finished no errors were pointed out to him. John Mossop, A.R.I.B.A., in practice in London, said that he had examined the plans, but they were not quite correct, as an alteration had been made. They were no doubt correct originally. The charges made by Mr. Swannell were moderate. Francis Thomas Murcer, an architect of 20 years' experience, said that he had examined the plans, which were substantial to work upon. The walls were all right, and from the plans he thought the supports for the roofing were ample. He thought the charge made by the plaintiff was a very reasonable and usual one. Cross-examined: He was not a member of the Royal Institute. There were some things in the plans which were not shown which ought to be. Mr. Cohen explained that £10 had been paid into court. Mr. Walter William Hudson, builder, of Rickmansworth, said that the plaintiff had prepared plans for him on two occasions. On a job of £300 he had charged witness £2 2s. At the request of Mr. Wright he saw the plaintiff, and asked him to prepare plans for these houses and to prepare specifications. With regard to the three houses, there was a slight difference between the two outside ones. Witness went into the plans and found that they were not practicable to work upon. The specification was about the same as the plans, and it was impossible to work upon them in any way. Witness told him that they would want a lot of alteration, and he admitted this, and said that he would do it. Subsequently plans and specifications had to be got out, and the plans of the plaintiff could not be used in any way. The plans were wrong all over. Witness told Mr. White that they would not cost above £7 or £8. Andrew William Anderson, A.R.I.B.A., was also called for the defendant, and stated that he had gone carefully through the plans and specifications. The plans were exceedingly ill-devised. There were two flights of stairs, which was waste of room, as there only ought to be one. Then there was a closet and a w.c. in the bathroom, which might easily have been avoided. As to the roof, it was not shown in the plans as to its construction, nor was it specified. The supports which carried the roof were ridiculously small. The design was quite unworkable, and if the plans had been worked the result would have been serious. He should think the work was that of someone who had copied them from some other specification, and knowing nothing at all about what he was copying. Alfred James Heath, a builder, said he was asked to inspect the plans for these houses. He went through the same with Mr. Hudson, and he suggested to Mr. Hudson certain alterations. The specifications were not at all proper. The jury retired, and, on returning, awarded £25 to the plaintiff. His Honour, therefore, gave judgment for the amount awarded with costs.

Architects' Action for Services Rendered.—A building dispute at Finedon has just been decided by Mr. Pollock, the Official Referee attached to the Queen's Bench Division of the High Court of Justice. The appellants were Messrs. Mosley and Anderson, architects and surveyors, Northampton, and the defendant was Mr. Lewis Bradshaw, brush manufacturer, of Kettering, the claim being for £65 4s. balance of account for services rendered by plaintiffs in connection with the laying-out of the Townside building estate at Finedon. The defendant entered a counter-claim of £300 for damages, alleging negligence. The plaintiffs were represented by Mr Griffith Jones, and were supported by several architects, surveyors, builders, and contractors from the Northampton district. Defendant was represented by Mr. Frank Dodd, and was supported by Mr. H. O. Cresswell, of London, and Mr. J. M. Wilson, of Kettering (defendant's consulting architect and surveyor). The case lasted eight days. The judgment of the Official Referee, after dealing at length with the facts adduced on both sides, stated that there was one important part of the contract, the mode in which the sewers and surface drains were to be made, as to which it was clear from the evidence of both sides that Messrs. Mosley and Anderson did not see that the contractor carried out his contract; that it was perfectly clear from the evidence of Mr. Gunning, a person of very great eminence in his profession, that the work carried out by Mr. Wilmott was not in accordance with the specifications. Under those circumstances, it seemed that the defendant was entitled to recover. The Referee stated that he placed great reliance upon Mr. Cresswell's evidence, which showed that Mr. Wilson's plan was correct and that of the plaintiffs incorrect. The result was that it was of no value to Mr. Bradshaw. After dealing with the various headings mentioned in the claim and counter-claim, the Referee allowed the defendant Bradshaw a total sum of £172 15s., with costs of the action.

The Formation of Streets.—Armstrong v. the London County Council.—The appellant in this case, heard in the Court of Appeal on the 21st inst. by the Lord Chief Justice, Mr. Justice Bigham, and Mr. Justice Darling, Mr. Armstrong, owns some three acres of land known as the Cleveland Estate, which lies between Highgate-road and Parliament Hill-fields. In August, 1898, an information was, at the instance of the London County Council, laid against him before three Justices of the Peace, sitting as a Court of Summary Jurisdiction at Highgate, charging that he had in that and the previous month, contrary to the provisions of section 7 of the London Building Act of 1874, commenced to form and lay out a street for carriage traffic without the sanction of the Council. What the appellant was proceeding to do was to erect twenty blocks of flats, sixteen of which would form a quadrangle, with an ornamental garden in the centre and a carriage-way running round it. The approach to this carriage-way would run between the other four flats, two of which were to be erected on each side of it. The total length of the carriage-way, when complete, was to be 600ft., and it was to be formed and sewered in all respects in a similar manner to the carriage-way of an ordinary street. At the entrance to the plaintiff's property, from a public carriage-way called The Grove, it was proposed to place gates in charge of a porter, who would admit to the inclosure only tenants, visitors, and tradesmen, while the public would not be entitled to enter either the approach or the quadrangle. The respondents contended that the appellant had commenced to form or lay out a street for carriage traffic without the sanction of the Council, as provided for by the section; but, on the other hand, it was urged that all that Mr. Armstrong, who did not intend to dedicate any right-of-way to the public, was doing was to form a private courtyard, or private carriage drive and approach, and that, therefore, his action did not come under the operation of the statute. The justices found that the carriage-way would be, when formed, a street, and that the appellant, in commencing to form and lay it out, had contravened the section. They, therefore, fined him 20s. and five guineas costs, but as Mr. Armstrong wished to appeal they stated a case for the opinion of this Court. The counsel engaged in the case were, for the appellant, Mr. Macmorran, Q.C., and Mr. R. Cunningham Glen; while Mr. Horace Avory and Mr. Dalby appeared for the County Council. The Lord Chief Justice, who delivered the judgment of the Court, said that there was no finding of any obligation on the part of the appellant to maintain the porter or the gates, and the Act involved a large interference with the rights of private owners for the health, safety, and convenience of the public. A wide interpretation was given in it to the word "street," and this was not the less a street because it was intended to be used as a private way for private traffic to and from the houses or flats. The Court thought the property which the appellant began to lay out was a street under section 7 of the Act, and as he did so without having obtained the sanction of the respondents, he committed the offence of which he had been convicted. The magistrates would have wrongly decided had they decided otherwise than they did. The appeal would, therefore, be dismissed with costs.

CHIPS.

In consequence of the appointment of Mr. T. E. Stanton, D.Sc., senior assistant lecturer in engineering at University College, Liverpool, to the post of Professor of Engineering at University College, Bristol, a vacancy in the staff at Liverpool has been created, which has been filled by the appointment of Mr. E. Brown, B.Sc.

The Hellenic Government has notified its representatives abroad, and also all foreign institutions concerned, that in future the export of antiquities from Greece is forbidden. A new law giving effect to this decision has recently come into force, and will be strictly applied, except in the case of antiquities and objects which the Government may declare to be not of sufficient importance or interest to be retained in Greece for the national museums of the country.

A new mission-hall for St. Peter Mancroft parish, Norwich, was opened by the bishop of the diocese last week. Mr. Beck, of that city, was the honorary architect, and Messrs. Downing were the builders.

The town council of Barnstaple, at their last meeting, appointed Mr. A. Thorne, one of their fellows, who has practised as an architect in the town for the last twenty years, as borough surveyor.

The Oldham School Board discussed and rejected at their last meeting a proposal to reduce the commission paid to architects, including quantities' preparation, from 7½ to 5 per cent.

Messrs. Elliston and Cavell's premises, Magdalen-street, Oxford, are being rearranged and enlarged at a cost of over £10,000, and when completed will be the finest shop in the city. Mr. Herbert Quinton, of 22, George-street, Oxford, is the architect.

The death occurred on Wednesday week at his residence, Rivelin, Richmond Park, Liverpool, of Mr. Cornelius Desoer, builder and contractor, who had for over thirteen years been a member of the West Derby Board of Guardians. Mr. Desoer was 59 years of age, and had carried out many important contracts for the corporations of Liverpool and Birkenhead, and other local bodies.

WATER SUPPLY AND SANITARY MATTERS.

Ardsley, near Barnsley.—At a special meeting of the Ardsley Urban District Council, held on Dec. 20, it was decided to adopt a scheme for the bacterial treatment of the sewage of the Hoyle Mill and Measbro' Dike portion of their district. The scheme, which has been prepared by Mr. Theo. S. McCallum, A.M.Inst.C.E., of Manchester, provides for pumping the sewage, and then treating it in a series of septic tanks, and subsequently by a series of double-contact bacteria beds. The sanction of the Local Government Board will be sought forthwith.

Morecambe.—At a special meeting of the urban district council last week, the contract for the first section of the Morecambe sewage scheme was let to Schofield Brothers, Leeds, for £6,500. This section includes the construction of the sewerage works septic tanks, outfall works, and sewering of the east and west ends of Morecambe. The domestic effluent principally will be dealt with, surface water being turned into the existing drainage system, which will be supplemented in the newer parts of the town. The estimated cost of the full scheme was £57,085, including the second section for Bare and Forrisholme, which is now expected to cost £10,000 or £15,000 additional. Tenders for this section were received on Tuesday, and tenders for the construction of thirty-five new streets were let for £10,000, the contractors being Mr. Ireland, of Morecambe, and Mr. Johnson, of Lancaster. Mr. Fothergill, building inspector to the Dewsbury Corporation, was appointed building inspector to the Morecambe Council out of 153 applicants.

Northwich.—At the last meeting of the urban district council a letter was read from the Local Government Board stating that, subject to the condition that the pipe sewers would be surrounded with concrete where they were laid at a greater depth than 15ft., the Board would consent to the borrowing by the urban council of £25,000 for purposes of sewerage and sewage disposal in the Castle Ward. The letter was referred to a committee.

CHIPS.

The following is a list of those to whom scholarships have been awarded for the year 1899 by the British Institution Scholarship Fund, and the schools at which they were pupils when elected:—In painting, Francis E. Coulthurst, Oswald Crompton, and Frederick G. Swaish—all of the Royal Academy Schools; in sculpture, Charles A. Palmer and Sidney March (extra), both of the Royal College of Art; in architecture, Thomas A. Williams, of the Chester School of Art; and in engraving, Ethel Mahala Morgan, of the Royal College of Art.

Alterations are being made at the Royal Stables, Windsor Castle, from the designs of Mr. Alf. Nutt, Office of Works, Windsor Castle, and special consideration has been given to the ventilation, which will be carried out on the Boyle system.

The Glasgow Corporation accepted on Wednesday the offer of the National Conduit Company of New York for the equipment of the electric tramways. The contract price was £151,000, or £10,000 lower than the British offers.

Sanction from the Light Railway Commissioners, in connection with the draft order of the Colne and Trawden Light Railway, has been received.

Messrs. Sheepshanks, Winsley Hurst, Ripley, Yorks, have had a new clock fixed in the tower of the Burnt Gates Church, near Ripley, Yorks, which adjoins the Pateley Bridge and Knaresborough highway. The work was carried out by Messrs. W. Potts and Sons, clock manufacturers, of Leeds and Newcastle-on-Tyne.

The Worcestershire County Council have completed the purchase of the Barnsley Hall Estate, near Bromgrove. This property, comprising about 320 acres, recently belonging to Mr. Howard Avery, Edgbaston, is situated on the western slope of the Lickey Hills, and has been acquired as a site for the new lunatic asylum, which the Worcestershire County Council have decided to erect.

A discovery of considerable interest to antiquaries has just been made at Canterbury Cathedral, definite evidence being now forthcoming that the recess in the north ambulatory of the presbytery in which the chained Bible lies was the site where in pre-Reformation times the Easter sepulchre was deposited during Holy Week. The alteration was doubtless the work of Archbishop Cranmer.

The yearly statistical returns as furnished by the Baptist denomination show that during 1899 the sum of £66,743 has been contributed towards the erection of 43 new chapels, bringing the total number of sittings provided up to 1,330,416. For new schools, enlargements of chapels, and similar objects, the sum of £36,788 has been contributed, while the debts on trust property have been reduced by £77,024.

Our Office Table.

The satisfactory solidarity of the Surveyors' Institution is about to be still further cemented by the establishment of a benevolent fund for the relief of past or present members who, from no fault of their own, have fallen into necessitous circumstances. One of its past presidents has offered to contribute the munificent sum of £500 as a nucleus for a fund of the kind, and two other sums of £500 each have been promised—one by a Fellow of the Institution and the other by a well-known surveyor, and these and other contributions promised amount collectively to close upon £3,000, which may be regarded as an encouraging beginning for the fund. The council consequently is now in a position to make a general appeal to the members for their individual support to a movement the objects of which are to relieve, either by annuities or grants, necessitous fellows or professional associates of the institution and their children, and the widows or children of, or those dependent upon, former fellows and professional associates who have ceased to be such, either by death or resignation, but who have been for at least three years contributing members to the funds of the institution.

It is satisfactory to learn that the Establishment Committee of the London County Council have decided to publish a selection of such of the records in the possession of the Council as are of historic interest. The Council possesses the official documents formerly belonging to the several Commissioners of Sewers which exercised jurisdiction over what is now the County of London, and some of the adjacent parts. The earliest documents relate to the Surrey and Kent Commissioners of Sewers, who were instituted under the Act of Henry VIII. in 1514 or 1515; and the minutes of the Commission, which are in 24 volumes, begin in January, 1557-58. Discrepancies occur in this series, but after 1703 they go on continuously to 1847. The next oldest collection of minutes is that of the Greenwich Commission, whose minutes range from 1625 to 1847; then the Poplar Commission from 1629 to 1847, the Westminster Commission from 1659 to to 1847, the Tower Hamlets Commission from 1702 to 1847, the Holborn and Finsbury Commission from 1716 to 1847, the St. Katherine's Commission from 1782 to 1841, and, lastly, the Metropolitan Commission of Sewers from 1847 to the formation of the Metropolitan Board of Works in 1855. Besides these records there are also the deeds and papers relating to important properties accruing in the conveyancing branch of the solicitor's department, including the Newport market charter and the deeds connected with the ownership of Northumberland House.

Pursuant to a resolution adopted by the St. Pancras Vestry, a conference of delegates of the London vestries and district boards of works is to be held early in the New Year, to concert some general plan for erecting municipal dwellings in the Metropolis, and, as a condition precedent to this, obtaining greater borrowing powers. The proposal with regard to St. Pancras is that a million sterling should be borrowed on the security of the rates for the erection of 30 blocks of industrial dwellings, collectively accommodating 15,000 people. The interest to be paid for the loan he fixes at 2½ per cent, and, at a charge of 2s. per room, Mr. J. Thornley, who initiated the movement, estimates a yearly revenue of £39,000 to meet an expenditure of £38,000; or, if the loan be repaid on the annuity system within 50 years, he apprehends a deficit of £9,000 a year, involving a penny rate. Owing to the difficulty of finding room to live in St. Pancras, many working men with their families are obliged to seek shelter in the local workhouse.

It has been discovered in St. Paul, Minnesota, that electric ground-connections, made by attaching wires to water-pipes, not only ruin the pipes by electrolysis, but seriously interfere with the operation of the water-meters. In one case a meter through which a large quantity of water was being discharged failed to register. This was an extreme case and easily detected, but what the effect has been upon the indicators in cases where the current is not so strong the officers of the Water Board have no means to determine. To protect themselves, however, they have ordered the removal of all electric wires from the water-pipes. It is a measure of safety, too, for the employés of the board, many of whom have sustained severe shocks while at work upon the pipes and meters.

An artificial stone from Belgium has recently been introduced into the French market, which is said to have four times the force of resistance of French freestone, and which has nearly all the properties of Cobestang granite. Consul Atwell, of Roubaix, states that it has been tried in the Malines Arsenal, and is found to be insensible to the action of cold, absorbs only 6 or 7 per cent. of water, even after a long dry spell, and cannot be crushed under a pressure of 40 kilogrammes (88lb.) to the square centimètre (square centimètre = ·155sq.in). This artificial stone is manufactured at Uccles, near Brussels, in the following manner:—Eighty parts of extremely clean and dry coarse sand are mixed with 50 parts of hydraulic lime reduced to a fine dry dust; this mixture is put in an iron box, which is plunged into a boiler of water, and this is hermetically closed. During 72 hours the cooking goes on under six atmospheres, the temperature being maintained at 165°. At the end of this time, the iron box contains a perfect homogeneous mass of stone which rapidly hardens upon exposure to the air. The most varied colours are given to this stone, and its manufacture costs only one penny per cubic foot.

A new fireproof material is described in the last number of the American *Street Railway Journal*. It is made of granite chips, pulverised, moulded into form, and fused together at a temperature of 3,000° Fahr. Its crushing strength is very high. It can be heated red-hot and thrown into cold water without being injured. It resists the action of acids and alkalies, and is frostproof, having been tested by liquefied air at a temperature of 350° below zero without injury. A test made at Niagara Falls showed that it required 56,600 volts to penetrate about ½in. of the material.

MEETINGS FOR THE ENSUING WEEK

Friday.—Architectural Association: Discussion Section. "The Public Monuments of London, Architecturally Considered," by V. H. King. 7 p.m.

Trade News.

WAGES MOVEMENTS.

Walkden.—The trade-union of painters in the Walkden district of South-East Lancashire have just applied for an advance in wages of one halfpenny per hour, and certain alterations in their working rules. Their present wages are 8d. per hour. Their application is under the consideration of the various employers.

Sir Theodore Martin, K.C.B., has presented a new organ to Llantysilio Church, in the Vale of Llangollen, where a marble alto-rilievo of the late Lady Martin (Helen Faucit) was recently placed in the chancel of the church.

Although, as is usual in the week previous to Christmas, the returns at the London Mart last week were small, amounting only to £10,785, they nevertheless exceed those of the corresponding week last year.

On Saturday, a new church, which has been built by Park United Presbyterian Church congregation, Dundee, was opened. The edifice, which is seated for £680 persons, has cost £3,200, and occupies a site in the east end at the corner of Park-avenue and Morgan-street.

W. H. LASCELLES and Co.,
121, Bunhill Row, London, E.C.
TELEPHONE No. 270.
HIGH-CLASS JOINERY.
LASCELLES' CONCRETE.
Conservatories & Greenhouses.
WOODEN BUILDINGS.
BANK, OFFICE, & SHOP FITTINGS.
CHURCH BENCHES & PULPITS.
ESTIMATES GIVEN ON APPLICATION.

LIST OF COMPETITIONS OPEN.

Dunoon—East Bay Improvement	£100, £50, £25	J. Valrose Clery, Town Clerk, Dunoon	Jan. 8
Barnsley—St. Edward's Church and Vicarage, Kingston-place.	£50, £30, £20	Lancaster and Son, Church-street, Barnsley, Yorkshire	Feb. 1
Doncaster—Isolation Hospital (41 beds)	£25 (merged), £15	F. E. Nicholson, Solicitor, U.D.C. Offices, Doncaster	,, 2
Belfast—Assembly Hall and Central Offices	£100, £50, £25	W. D. Eakin, 12, May-street, Belfast	Mar. 1
Walsall—Municipal Buildings (Assessor)	Five selected, £100 each	John R. Cooper, Town Clerk's Office, Walsall	,, 3
Harrogate—Northern Police Convalescent Home		The Hon. Secretary, St. George's, Harrogate	—
Glasgow—General Hospital (1,200), Stobhill Estate, Springburn	£200, £150, £100, £50	Jas. R. Motion, Parish Council Chmbrs., 38, Cochrane-st., Glasgow	—

LIST OF TENDERS OPEN.

BUILDINGS.

Embleton—Renovations to Paradise	Mrs. Benson	M. Temple Wilson, A.S.I., Architect, Alnwick	Dec. 30
Dudley—Reroofing Halesowen-road Schools	School Board	T. Grazebrook, Architect, Dudley	,, 30
Thrapston—Infirmary at Workhouse	Guardians	Blackwell and Thomson, Architects, Parkstile Chambers, Kettering	,, 30
Devonport—Demolition of Old Bear Creek Oil Store		The Borough Electrical Engineer, Technical Schools, Devonport	,, 30
Newcastle-upon-Tyne—Offices and Pupil Teachers' Centre	School Board	W. H. Knowles, F.S.A., Archt., 37, Grainger-st., Newcastle-on-Tyne	,, 30
Aberystwith—Two Villas, Llandabarn-road	Thomas Owen	J. Arthur Jones, Architect, 7, Queen's-terrace, Aberystwith	,, 30
Londonderry—Twelve Houses		Daniel Conroy, Architect, 2, Bishop-street, Londonderry	,, 30
Dudley—Cookery-Room, Northfield-road Schools	School Board	T. Grazebrook, Architect, Dudley	,, 30
Wombwell—Five Houses, Main-street		Jos. Mattock, Main-street, Wombwell	,, 30
Donington—Tool-House	Parish Council	A. G. Fletcher, Clerk, Donington	,, 30
Bourne, Lincs—Six Cottages	George Wheatley	F. G. Shilcock, Architect, West-street, Bourne	,, 30
Connah's Quay—Classroom, St. Mark's Schools		Rev. Thos. Williams, St. Mark's Vicarage, Connah's Quay, Flints	,, 30
Morecambe—Villas and Stables, Grove-street	Mrs. Emary	A. Lancelot Lang, Architect, 12A, Pedder-street, Morecambe	Jan. 1
Cardonagh—Station Buildings	Londonderry & Lough Swilly Ry. Co.	Fred. Dawson, Secretary, Shipquay-street Buildings, Londonderry	,, 1
Thrapston—Additions to Woodford House		Wilfred Plevins, Woodford House, Thrapston	,, 1
Belper—Enlarging Manual Workshop	School Board	Hunter and Woodhouse, Architects, Belper	,, 1
Glasgow—Extensions to Whitevale Tramways Depot	Corporation	John Young, General Manager, 83, Renfield-street, Glasgow	,, 2
Bradford—Warehouse at Victoria Mills		Samuel Jackson and Son, Architects, Tanfield Chambers, Bradford	,, 2
Darlington—Alterations, Turk's Head Hotel, Bondgate	Plews and Sons	Dickinson and Son, Architects, 5, Hound Gate, Darlington	,, 2
Harlington—School Premises	School Board	R. M. White, Clerk, Ampthill	,, 2
Ashton-under-Lyne—Shops, &c., Old-street		George and Son, Old-square, Ashton-under-Lyne	,, 2
Oldham—Public Baths, Hathershaw	Corporation	S. A. Pickering, A.M.I.C.E., Boro' Surveyor, Town Hall, Oldham	,, 2
Borough, S.E.—Strengthening Floors at Stores, 4, Mermaid-ct.	Metropolitan Asylums Board	T. Duncombe Mann, Clerk, Norfolk H., Norfolk-st., Strand, W.C.	,, 3
Cilybebyll—Isolation Hospital	Pontardawe Hospital Committee	John Morgan, Surveyor, Herbert Chambers, Pontardawe	,, 3
Bessingby—Additions to Farmhouse		J. Earnshaw, M.S.A., Architect, Carlton House, Bridlington Quay.	,, 4
Streatham Hill, S.W.—Additions to St. Anne's Home	St. Pancras Guardians	Salter, Issott, and Salter, Archts., 13, Phœnix-street, St. Pancras	,, 4
Hoxton, N.—Costermongers' Stalls, Nile-street	Shoreditch Vestry	J. Rush Dixon, A.M.I.C.E., Engineer, Town Hall, Old-street, E.C.	,, 4
West Hampstead—Branch Public Library, Westbere-road	St. John's Vestry	Arthur P. Johnson, Vestry Clerk, Haverstock Hill, N.W.	,, 4
Bridlington Quay—Dwelling Houses, Bessingby Estate	A. G. W. Wright	J. Earnshaw, M.S.A., Architect, Carlton House, Bridlington Quay	,, 4
Chapel-Saint-Leonards—Rebuilding Primitive Methodist Chapel		D. Crow, Farmer, Chapel-Saint-Leonards	,, 4
Linthwaite—Five Dwelling-Houses at Jovil	Industrial Co-operative Socy., Ltd.	J. Berry, Architect, 9, Queen-street, Huddersfield	,, 5
Whitley—Council Offices, Fire Brigade House, and Stores	Whitley and Monkseaton U.D.C.	J. P. Spencer, A.M.I.C.E., 13, Grainger-st. West, Newcastle-on-T.	,, 5
Birmingham—Additions to Coachman's House at Workhouse	Guardians	W. H. Ward, Architect, Paradise-street, Birmingham	,, 6
Swindon—Additional Hospital Buildings	Swindon and Dis. Hospital Board	Halliday and Rodger, Architects, 14, High-street, Cardiff	,, 6
Penrhiwceiber—Additions to Workmen's Institute		Morgan and Elford, Architects, 1, Jeffrey-street, Mountain Ash	,, 8
Oswestry—Market Extension	Town Council	G. William Lacey, C.E., Borough Engineer, Guildhall, Oswestry	,, 8
Blaentylery—Mixed School (248 children)	Aberystwith School Board	R. L. Roberts, Victoria Chambers, Abercarn	,, 8
Eastbourne—Bandstand, Grand Parade	Pleasure Grounds Committee	R. M. Gloyne, A.M.I.C.E., Boro' Engineer, Town Hall, Eastbourne	,, 8
Oldmeldrum—Two Cottages, Ardconnon Farm		W. H. Williamson, Bendauch, Kinaidie	,, 8
Liversedge—Millbridge Upper School	School Board	Alfred E. Rhodes, Architect, Cemetery-road, Heckmondwike	,, 9
Hove—Alterations, Ellen-street Schools	School Board	Clayton and Black, 152, North-street, Brighton	,, 9
Llangollen—Alterations and Additions to Courthouse		The County Surveyor, Denbigh	,, 9
Preston—Post and Inland Revenue Offices	H.M. Commissioners of Works	The Secretary, H.M. Office of Works, &c., Storey's Gate, S.W.	,, 10
Kilkeel—Masonic Hall		R. B. Wray, Kilmorey Arms Hotel, Kilkeel, Ireland	,, 10
Heamoor—School	Madron School Board	Oliver Caldwell, F.R.I.B.A., Penzance	,, 10
London, S.E.—Disinfecting House at Lambeth Infirmary	Lambeth Guardians	S. R. J. Smith, Archt., 14 and 15, York Buildings, Adelphi, W.C.	,, 10
Huddersfield—Church, Crosland Moor		C. Hodgson Fowler, F.S.A., Architect, Durham	,, 11
Guildford—Sandfield Schools	School Board	A. J. Sturgess, Architect, 25, High-street, Guildford	,, 13
Llanrhaiadr-yn-Mochnant—Village Hall	Parish Council	E. Bremner, Smith, and Bremner, Architects, Oswestry	,, 13
Huddersfield—Children's Homes at Out-lane	Guardians	J. William Cocking, Architect, Cloth Hall-street, Huddersfield	,, 13
Bawtry—Church Restoration		C. Hodgson Fowler, F.S.A., Architect, The College, Durham	,, 13
Chiswick—Generating Station	Aberystwyth & Chiswick Elec. Corp.	Kincaid, Waller, & Manville, Engnrs., 29, Great George-st., S.W.	,, 15
Oxford—School Buildings, Union-street	School Board	Fred. P. Morrell, Clerk, 1, St. Giles', Oxford	,, 15
Drumshemuck—Farm Out-Offices	Andrew Johnston	Robert Scott, 15, Willoughby-place, Enniskillen	,, 15
Tunbridge Wells—Enlargement of Electric-Lighting Station	Corporation	C. H. Strange, A.R.I.B.A., Tunbridge Wells	,, 15
Grimsby—Workhouse Extension	Guardians	Herbert C. Scaping, Architect, Court Chambers, Great Grimsby	,, 15
Birkenhead—Electricity Generating Station, Craven-street	Corporation	C. Brownridge, A.M.I.C.E., Boro' Eng., Town Hall, Birkenhead	,, 16
Chadderton—County Police Station and Courtroom	Standing Joint Committee	Henry Littler, Architect, County Offices, Preston	,, 16
Willesden—Foundations, &c., for Infirmary, Acton-lane	Guardians	A. Saxon Snell, F.R.I.B.A., Southampton Bldgs., Chancery-l., W.C.	,, 17
Sheffield—Nurses' Home, &c.	Guardians	E. W. Mountford, F.R.I.B.A., Archt., 17, Buckingham-st., London	,, 20
Kentish Town, N.W.—Public Baths and Washhouses	St. Pancras Vestry	T. W. Aldwinckle, F.R.I.B.A., Architect, 1, Victoria-street, S.W.	,, 26
Sunderland—School Buildings, High Barnes Estate	School Board	T. W. Bryers, Clerk, Sunderland	,, 29
Hemingfield—House and Stable		John Robinson, Wombwell	—
Cloughton—Cottages	H. E. Donner	Charles Edeson, Architect, 5, Huntriss-row, Scarborough	—
Parkstone—Club Premises, Ashley-road	Heatherland Unionist Club	Walter Andrew, Architect, Alton Office, Parkstone	—
Beeston—Schools, Humber-road		Robt. Clarke, Architect, Prudential Buildings, Nottingham	—
Castleford—Additions to Premises, Carlton-street	E. Millar	Garside and Pennington, Architects, Castleford	—
Hull—Alterations to Imperial Hotel		W. S. Walker and J. M. Dossor, Joint Archts., 2, Manor-st., Hull	—
Raunds—Six Houses, Marshall-road	Robinson and Northern	Harry Knight, Surveyor, Newton-road, Rushden	—
Walham Green, S.W.—Block of Flats		Albert G. Hastilow, Architect, 104, Upper Richmond-road, Putney.	—
Southerdown—Additions to Marine Hotel	R. T. Davis	Seddon and Carter, Archts., Bank Buildings, St. Mary-st., Cardiff	—
Horwich—Enlargement of British Schools, Lee-Lane		E. W. Dyson, Architect, 17, Lee-lane, Horwich	—
Cambridge—Corrugated Shed (40ft. by 80ft.)		Pamplin Bros., Cherry Hinton Works, Cambridge	—
Rawtenstall—Showrooms, &c.	Eastwood and Clegg	F. Hobson, Architect, Burnley-road, Rawtenstall	—
Farsley—Eight Houses		J. P. Kay, Architect, 34, Prudential Buildings, Leeds	—
Sheffield—Works, Buildings, &c., Walkley-lane	G. A. Milne	Henry Webster, Archt., St. Mary's Chmbrs., Norfolk-row, Sheffield	—
Whalley Range—Presbyterian Church		Fred W. Dixon, Architect, Trevelyan Buildings, Manchester	—
Belfast—Improvements to Licensed Premises, Roden-street	A. and D. Rooney	W. J. Moore, Architect, Whitehall Buildings, Ann-street, Belfast	—
Muckamore—Repairing and Ventilating Presbyterian Church		J. Hawthorne, Dunadry	—
Rawtenstall—Bakery and Stables	Hartley and Co.	F. J. Hobson, Architect, King-street, Rawtenstall	—
Donhead St. Andrew—Reroofing South Aisle of Church		W. E. King, Donhead Lodge, Salisbury	—
Rawtenstall—Alterations to Bishop Blaize Hotel		John Baxter, Limited, Glen Top, Waterfoot	—
Carlisle—Cookery School, Ashley-street	School Board	T. Taylor Scott, F.R.I.B.A., Architect, 43, Lowther-street, Carlisle.	—
Long Eaton—Five Shops		Ernest R. Ridgway, M.S.I., Architect, Long Eaton	—
Bromsgrove—Four Cottages	Highways Committee	Hope House, Kew Green	—
Leeds—Two Through Dwelling-Houses, Frankland-terrace		A. Philpotts, 5, Leopold-road, Leeds	—
Gisburne—Dining-Room, &c., Commercial Hotel	John Green	Thos. Bell, Architect, 14, Grimshawe-street, Burnley	—
Arbroath—Slaughter-Houses		Hugh Gavin, Architect, Arbroath	—
Styrrup—Rebuilding White Swan Inn	Worksop & Retford Brewery Co.	Vallance and Westwick, Archts., White Hart Chambers, Mansfield	—
Bradford—Three Through Houses in Chesham-street		R. Drake, Architect, 142, Allerton-road, Allerton	—
North Shields—Business Premises, Saville-street	Isaac Black	Hope and Maxwell, Architects, Trinity Buildings, Newcastle-on-T.	—
Ashington—Schools at New Hirst		The Secretary, Colliery Office, Ashington	—
Southend-on-Sea—Nelson Hotel, Prittlewell	Joseph Berry	Greenhalgh & Brockbank, Archts., Bank Chmbs., Southend-on-Sea	—
Great Yarmouth—Four Houses, Alderson-road		21, Howard-street South, Great Yarmouth	—
Hunslet—Four Houses and Shops, Jack-lane	John Hollings	W. Mason Coggill, Architect, Beach-grove, Stourton	—
New Shoreham—Releading or Slating Chancel Roof		F. C. Pilmore, Parish Warden, 3, Western-road, New Shoreham	—
Worksop—Alterations and Additions to Manton Inn	Worksop and Retford Brewery Co.	Vallance & Westwick, Architects, White Hart Chambers, Mansfield	—
Denby Grange—Twenty Beehive Coke Ovens		F. H. Waterhouse, Mngr., Denby Grange Collieries, near Wakefield	—
Grimsby—Workshop, &c.	Albatross Cycle Co.	George E. W. Davis, Architect, Victoria Chambers, Great Grimsby	—
Padiham—Seven Dwelling Houses, Burnley-road		Hitchon and Pritchard, 46, Manchester-road, Burnley	—
Felixstowe—Pair of Semi-Detached Houses, Beach-road	A. W. Franklin	H. W. Buxton, Archt., Lorne Bldgs., Victoria-parade, Felixstowe	—
Abergavenny—Additions, Boys' National School, Hereford-rd.		E. A. Johnson, F.R.I.B.A., Architect, Abergavenny	—
Ebbw Vale—Workmen's Cottages (150)		The Estate Office, Ebbw Vale	—

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